SELF-OTHER AGREEMENT AS MANIFESTED BY DIFFERENTIAL

RESPONSES ON SELF-REPORT AND OTHER-REPORT

FORMS OF PERSONALITY INVENTORIES

by

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To my wife, Margaret

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This study was designed to examine the differences in
self-other agreement of self- and other-report personality
inventories. Theorists have differed widely as to how much "true"
self-other agreement in perceptions there should be. Empirical
research has suggested that the amount of self-other agreement
depends on the length and closeness of the relationship.

Two of the research hypotheses dealt with relative
amounts of self-other agreement. It was predicted that self-
other agreement would increase (1) with the closeness of the
relationship and (2) with the length of the relationship. A
third research hypothesis (based on attribution theory) predicted
that highly outwardly observable traits would be indicated more
by other- than by self-reports, while inwardly observable traits
would be indicated more by self- than by other-reports. Finally,

the fourth hypothesis predicted that inventory responses would be influenced by the social desirability response set.

The personality inventory used to test these hypotheses was based on the theory of personality by Thomas (1971, 1978). The inventory attempts to assess the lead strength in three bipolar pairs of strengths along the dimensions of (1) thinking-risking, (2) practical-theoretical thinking, and (3) dependent-independent risking.

The sample consisted of Bi/Polar seminar attendees of size $\underline{N}$ = 3,613 along with a group of other raters of size $\underline{N}$ = 13,507. Self-perceptions were defined as the three scale scores from the self-report form of the Bi/Polar Inventory of Strengths, and other-perceptions were defined as those same scale scores from the other-report form. Since these samples were so large, tests of statistical significance were considered much less important than stated criteria of practical significance.

A principal axis factor analysis of the Inventory confirmed that it was assessing three orthogonal factors with item clusters as expected. Self-other agreement was measured by the generalized distance measure D between these three scale scores for each self and each associated other. Although results generally demonstrated inequalities in the hypothesized directions as predicted by all four hypotheses, only parts of the results for Hypothesis 4 were deemed practially significant by the stated decision rules.

This study indicated that disagreements in perceptions of a person's personality were essentially the same, regardless of the closeness or length of the relationship. Attribution theory was not supported, and the existence of a social desirability response set in the Inventory was partially supported.

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CHAPTER I

INTRODUCTION

The theory of self-concept has a long history in the
field of psychology. How we see ourselves and what we think of
ourselves are investigated through many different constructs--
self-esteem, self-confidence, etc. However, since a self-concept
is formed by how we perceive ourselves, self-perception plays a
critical role in the self concept that is formed. Theorists of
self-concept disagree widely over the avenue through which self-
perceptions lead to formation of a particular self-concept. One
of the easily recognized dimensions along which theorists differ
is the degree to which self-perceptions are influenced by people
other than the self. Some theorists believe that other people have
little or no consistent, important effect on the formation of self-
concept, while other theorists believe that other people form the
primary source from which information is obtained about the self.

The degree of influence of others on self-perception is
highly relevant to the area of personality assessment. Since many
assessment instruments employ a self-report format and this method
has been shown to be an effective measurement tool [Burdsal &
Schwartz (1975), Sherwood (1966), Shrauger & Osberg (1981)],
the use of others in assessing the personality trait component of
self-concept can provide very useful information. On the one

hand, if the formation of an individual's self-concept is independent of the influence of others, then assessment by others might provide a different point of view--a kind of cross-validation technique. These same differences in self-other ratings can provide information about the dynamics of their particular relationship. On the other hand, if it is found that self-concept is dependent on others' views, then either the self or the other as assessor could reveal the self-personality through appropriate instruments. Just as there exist "parallel forms" in test construction theory, so might there exist "parallel raters" in personality assessment theory.

In order to evaluate the role that others might play in personality assessment, the nature of self-other agreement as it is manifested in various types of relationships must be known. Bem (1972) argues that there exist factors in both self-assessment and other-assessment which can reduce the validity of those reports. Most other theorists (e.g. Duval & Wicklund, 1972) agree with Bem's assumption that self-reports will tend to be more valid than other-reports because more factors interfere with other- than with self-assessment. Furthermore, the degree of self-other agreement will vary between categories of "others" depending upon certain parameters in the relationship--specifically, the length and the closeness of the relationship. Empirical research generally supports the hypothesis that self-

and close friend-reports are in significant agreement (e.g. Scott & Johnson, 1972), but less support is found to demonstrate agreement when the "other" is assumed to be less "close" to the self (e.g. Fey, 1955). Bem also makes a strong theoretical argument that longer relationships provide more "sample of behavior" of the self for the "other" to observe, and this results in the "other" getting to know the self better (although there exists little direct research to support this assumption).

What role can others play in personality assessment? The answer to this question depends partly on the degree to which self and variously defined others agree as to the personality of the self. The crucial dimensions of the relationship along which self-other agreement appears to vary are 1) the intimacy or closeness and 2) the length of the relationship. The following literature review presents the theoretical and empirical research which bears on this question.

CHAPTER II

LITERATURE REVIEW

The broad theoretical and empirical underpinnings of
self-other agreement provide no consistent basis upon which to
judge when, how, and why self-other agreement takes place.
Theoretical positions vary from predictions of total agreement
due to underlying self-perception processes to sharp disagree-
ments due to differing methods of perception by the self and the
other. Overall, empirical results indicate that there is no
consistent agreement across all types of people and relationships.
The following review of literature examines these positions and
findings in greater detail.

Theoretical Perspectives

Symbolic interactionism. One of the most pervasive
theories of the formation of self-concept had its beginnings in
a philosophical work by Cooley (1902). He emphasizes the position
that self-concepts are not formed by personal reflection or evalu-
ation but in just the opposite way--self-concepts are based upon
how other people view us. By means of imagination an individual
perceives him/herself through another person's mind, and evalua-
tion of one's personal qualities finds expression only through
other people's values or opinions. Thus, Cooley invokes the

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idea of the looking-glass self, in which a person sees him/her-
self only as reflected from another person:

"Each to each a looking-glass

Reflects the other that doth pass." (Cooley, p. 184)

This concept of a looking-glass self has been more
thoroughly developed by Mead (1934). In his philosophical
treatise, Mead employs no qualifiers as he places emphasis upon
other people being absolutely necessary not only to a particular
self-concept but to a conscious awareness of the self as an
independent entity apart from the rest of the world.

> The self, as that which can be an object to itself,
> is essentially a social structure, and it arises in
> social experience. After a self has arisen, it in a
> certain sense provides for itself its social experi-
> ences, and so we can conceive of an absolutely solitary
> self. But it is impossible to conceive of a self
> arising outside of social experience (Mead, p. 140).

The formation of self-concept is not the only aspect of
life which is dependent on others. Insofar as personality is a
portion of self-concept, then personality is also determined by
social values and attitudes.

> What goes to make up the organized self is the organiza-
> tion of the attitudes which are common to the group.
> A person is a personality because he belongs to a com-
> munity, because he takes over the institutions of that
> community into his own conduct. He takes its language
> as a medium by which he gets his personality, and then
> through a process of taking the different roles that all
> the others furnish he comes to get the attitudes of the
> members of the community. Such, in a certain sense, is
> the structure of a man's personality (Mead, p. 162).

In fact, Mead uses the term self-consciousness to amplify the
message that when we perceive ourselves as object, we still per-
ceive in ourselves the social attitudes and opinions we have
learned. ". . .self-consciousness refers to the ability to call
out in ourselves a set of definite responses which belong to the
others of the group" (Mead, p. 163).

The existence of self can occur only in the presence of
others. Without the existence of a social structure to reflect
who we are, the self would go unnoticed to itself.

> Selves can only exist in definite relationships to other
> selves. No hard-and-fast line can be drawn between our
> own selves and the selves of others, since in so far as
> the selves of others exist and enter as such into our
> experience also. The individual possesses a self only
> in relation to the selves of the other members of his
> social group: and the structure of his self expresses
> or reflects the general behavior pattern of this social
> group to which he belongs, just as does the structure
> of the self of every other individual belonging to this
> social group (Mead, p. 164).

Mead does recognize a division of the self into an I
and a me . "The I is the response of the organism to the atti-
tudes of others which one himself assumes. The attitudes of the
others consistute the organized me, and then one reacts toward
that as an I " (Mead, p. 175). However, the I is governed by
social processes just as much as is the me . "Taken together,
they constitute a personality as it appears in social experience.
The self is essentially a social process going on with these two
distinguishable phases" (Mead, p. 178).

The development of mind is also under the influence of social processes. Without a recognition of others' existence, human intelligence would never develop.

> I want to be sure that we see that the content put into the mind is only a development and product of social interaction. . . . I know of no way in which intelligence or mind could arise or could have arisen, other than through the internalization by the individual of social processes of experience and behavior, that is, through this internalization of the conversation of significant gestures, as made possible by the individual's taking the attitudes of other individuals toward himself and toward what is being thought about (Mead, pp. 191-2).

Recognition of self as a separate entity from the rest of the world can take place only when others are recognized. Unless the experience of others comes into consciousness, there is no consciousness of self.

> We cannot realize ourselves except in so far as we can recognize the other in his relationship to us. It is as he takes the attitude of the other that the individual is able to realize himself as a self. . . . When the response of the other becomes an essential part in the experience or conduct of the individual; when taking the attitude of the other becomes an essential part in his behavior--then the individual appears in his own experience as a self; and until this happens he does not appear as a self (Mead, pp. 194-5).

Mead's general position on the relationship of the self to others is that the self is totally dependent on others (or the social process) for the development of self-consciousness, social attitudes, mental processes, and personality. Although Mead's position as to the importance of others in an individual life

seems extreme and excludes the process of self-evaluation, his theory has found favor among more modern theorists. Kinch (1963) derived a formal theory of self-concept based on Meadian notions of the development of self-concepts. He offers the following definition of self-concept: ". . .that organization of qualities that the individual attributes to himself" (Kinch, p. 481). In addition, he makes the following general theoretical statement about the origin and development of self-concept which accurately reflects the interactionist position. "The individual's conception of himself emerges from social interaction and, in turn, guides or influences the behavior of that individual" (Kinch, p. 481).

The first three postulates of Kinch's theory are based directly on Meadian assumptions concerning self-concept while each of Postulates 4, 5, and 6 is logically derived from the first three. Postulate 4 is a derivative of Postulates 1 and 2, Postulate 5 is a derivative of Postulates 1 and 3, and Postulate 6 is a derivation of either Postulates 5 and 2 or Postulates 3 and 4. Note that Postulates 1, 3, and 5 are important for the present research and can logically stand alone, while Postulates 2, 4, and 6 are included here solely to present all of Kinch's basic postulates.

    1. The individual's self-concept is based on his perception of the way others are responding to him.

2. The individual's self-concept functions to direct his behavior.

3. The individual's perception of the responses of others toward him reflects the actual responses of others toward him.

4. The way the individual perceives the responses of others toward him will influence his behavior.

5. The actual responses of others to the individual will determine the way he sees himself (his self-concept).

6. The actual responses of others toward the individual will effect [sic] the behavior of the individual.

(Kinch, p. 482)

Self-perception theory. Bem (1967, 1972) has proferred a theory of self-perception which reflects a behaviorist position of self-concept. However, Bem does recognize that a purely behaviorist position on self-perception by definition would ignore inner processes to which the self is privy, and he does qualify his position somewhat. The two basic postulates of his theory are as follows:

Individuals come to "know" their own attitudes, emotions, and other internal states partially by inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs. Thus, to the extent that internal cues are weak, ambiguous, or uninterpretable, the individual is functionally in the same position as an outside observer, an observer who must necessarily rely upon those same external cues to infer the individual's inner states (Bem, 1972, p. 2).

Bem emphasizes that self-perception is not limited to overt actions but also includes the circumstances or stimulus conditions under which those behaviors occur. Thus, a single behavior can have several motivational interpretations.

> For example, an individual might attribute "suddenly aroused determination" to his friend were he to see him chasing a mouse into the room with a raised broom. But he would attribute "fear" if an identical hasty entrance were to be followed rather than preceded by the mouse. Were no mouse present, he might well classify his friend's action as anger directed at him. In all three cases the overt behaviors observed are the same, and it is not particularly illuminating simply to say that the individual is responding to the "intent" of his friend or to the "meaning" of the action, since it is precisely the intent and meaning which require explication. In this example, it is clear that the meaning of the action resides in the mouse, that is, the intent or meaning is inferred from the stimulus conditions that appear to be controlling the observed behavior. To a radical behaviorist, this is the "intent" or "meaning" of the behavior. This, then, is the "something more" of interpersonal perception: the ability to respond not only to the overt behavior of others, but to respond as well to the controlling variables of which their behavior appears to be a function (Bem, 1972, pp. 5-6).

Bem's self-perception theory leads to the conclusion that, although others' perceptions of and attitudes toward the self are not determinant of self-concept, the self is in essentially the same position as any other person to make inferences about self-concept. ". . .an individual's attitude statements may be viewed as inferences from observations of his own overt behavior and its accompanying stimulus variables. As such, his

statements are functionally similar to those that any outside observer could make about him" (Bem, 1967, p. 186).

Theory of objective self awareness. Duval and Wicklund (1972) have developed a theory of self-concept which is included in their larger theory of "objective self-awareness." The major theoretical statement which they make concerns two types of awareness that people have.

> "Subjective self-awareness" is a state of consciousness in which attention is focused on events external to the individual's consciousness, personal history, or body, whereas "objective self-awareness" is exactly the opposite conscious state. . . . When attention is directed inward and the individual's consciousness is focused on himself, he is the object of his own con- sciousness--hence "objective" self-awareness. When attention is directed away from himself he is the "sub- ject" of the consciousness that is directed toward external objects, thus the term "subjective" self- awareness (Duval & Wicklund, p. 2)..

According to Duval and Wicklund, these two states of awareness are temporally mutually exclusive, i.e. it is impos- sible to be both subjectively and objectively self-aware. As such, the state of self-awareness which is most pertinent to the present study is objective self-awareness as ". . .self-evalua- tion is not characteristic of subjective self-awareness" (Duval & Wicklund, p. 4).

Stimuli which cause a person to focus attention on the self lead to the state of objective self-awareness. These stimuli can take various forms (a prime example is an external

representation of the self in the physical world such as a

reflected image from a mirror or tape recording of the voice),

but, for the present study, the most important stimuli leading to

objective self-awareness is the presence of another person and

the knowledge that the other person is aware of him/her. However,

the effect of the other person on both the intensity and the

nature of objective self-awareness is limited.

> The individual is not seen by us as using the values of
> the other as the criteria for his self-evaluation--but
> he can employ the dimensions that are set off by their
> presence. . . . The more attentive or potentially
> attentive the other is perceived, the more power the
> other will have to generate the objective state"
> (Duval & Wicklund, pp. 8-9).

Thus, Duval and Wicklund recognize that another person

can play a role in bringing about self-evaluation, but that role

does not include absolute criteria along the dimensions which are

made salient. Those criteria involve personal standards which

are composed of

> . . .mental representations of correct behavior,
> attitudes, and traits. . . . In the case of personality
> traits, each individual would have certain mental
> representations of ideal personality traits, such as
> intelligence, adaptiveness, and so on" (Duval &
> Wicklund, pp. 3-4).

Social comparison theory. Festinger (1954) presents a

theory of social comparison processes which provides an insight

into the conditions under which a person is affected by the

opinions and points of view of others. Although his total theory

is much more extensive than the portions which are presented
here, the accuracy of these particular hypotheses is in no way
diminished by their being presented outside of the whole con-
text.

The first hypothesis deals with the degree to which a
person will use other people as a measure of personal qualities.

> Hypothesis II: To the extent that objective, non-
> social means are not available, people evaluate their
> opinions and abilities by comparison respectively
> with the opinions and abilities of others (Festinger,
> p. 118).

Festinger points out that both abilities and opinions frequently
have no clear physical or objective referrent with which to be
judged. Some examples he cites are level of intelligence (is it
adequate?) and opinions as to the desirability of political can-
didates. In these cases, judgments of intellectual ability and
correctness of political opinion usually lie in comparison with
intellectual abilities and political opinions, respectively, of
others.

A corollary of Hypothesis II reflects the relative
importance of objective, non-social bases and social bases for
the purpose of evaluating personal qualities.

> Corollary II B: When an objective, non-social basis
> for the evaluation of one's ability or opinion is
> readily available persons will not evaluate their
> opinions or abilities by comparison with others
> (Festinger, p. 120).

Clearly, this statement reflects Festinger's idea that other

people are a less desirable referrent or standard with which to
compare the adequacy of one's abilities and the correctness of
one's opinions than are objective measures.

Festinger does demonstrate his belief in the importance
of some outside criterion to the process of self-evaluation:
"Corollary II A: In the absence of both a physical and a social
comparison, subjective evaluations of opinions and abilities are
unstable" (Festinger, p. 119).   Thus, self-evaluations take on a
sense of certainty only when confirmed or changed through
reference to an outside criterion.

Attribution theory.   A theory which bears on the general
subject of self-concept but deals more specifically with the
causes of behavior is that of attribution (Jones et al., 1972).
Specific terms which have developed within this theoretical
framework to refer to self and others are actor and observer,
respectively.   The main tenet of this theory points to the fact
that actors and observers see the actor in very different ways:
". . .there is a pervasive tendency for actors to attribute
their actions to situational requirements, whereas observers
tend to attribute the same actions to stable personal disposi-
tions" (Jones et al., p. 80).

Attribution theory does not offer any direct theoretical
perspectives on the question of observers' influences on actors'

self-concept, but the implication from the theory is that actors do not derive self-information from others. In fact, the general position in attribution theory is that actors can observe their own behavior as well as any observer but pay attention to different aspects of the situation.

> Actors are self-observers, viewing their own behavior in terms of the surrounding context and inferring what their attitudes and feeling must have been. We agree that actors often reflect on their own actions to check on the direction and intensity of their attitudes and feelings, but contend that actors are much more likely than observers to see those actions as constrained by the situations. We feel it is frequently the case that. . .observers make dispositional inferences from behavior that is interpreted quite differently by actors (Jones et al., p. 83).

Thus, far from deriving self-concept or basing self-evaluation on the opinions of an outside observer, actors will have opinions of self which are at variance with those of observers.

Degree of self-other agreement. Mead (1934) discusses the self in relation to two different types of others. Since the appearance of the self changes with respect to each type, distinguishing between these two conceptions of the "other" is important.

The first concept is that of the generalized other-- "the organized community or social group which gives to the individual his unity of self" (Mead, p. 154). Mead believes that an individual, complete self is a reflection of this generalized other.

> . . .the various elementary selves which constitute, or
> are organized into, a complete self are the various
> aspects of the structure of that complete self answering
> to the various aspects of the structure of the social
> process as a whole; the structure of the complete self
> is thus a reflection of the complete social process
> (Mead, p. 144).

The second concept of other is that of an individual person. However, since the unitary self is a reflection of the complete social process or generalized other, then the self which is shown to an individual other is only a fragmentary part of the total self.

> We carry on a whole series of different relationships
> to different people. We are one thing to one man and
> another thing to another. There are parts of the self
> which exist only for the self in relationship to itself.
> We divide ourselves up in all sorts of different selves
> answering to all sorts of different social reactions
> (Mead, p. 142).

From Mead's analysis it appears that self-concept will theoretically be the same as that concept of self possessed by the generalized other. Self-concept and the concept that particular other individuals have of that self will apparently be congruent to the extent that the particular other individual reflects the attitude of the generalized other. Thus, from Mead's writings, it is not possible to determine which individual others' concepts will be the same as the individual's self-concept.

Although Kinch (1963) derives his theory from Mead's writings, he appears to be less radical in his definition of others. Whereas Mead sees others constituted by a community of

people or the more amorphorous generalized other (beyond those with whom the self is in personal contact), Kinch (although he offers no specific definition) consistently refers to "others" as those with whom the self has immediate personal contact.

The accuracy of Postulate 5 (responses of others determine self-concept) is dependent on the accuracy of Postulate 1 and 3, from which it is derived. Postulate 1 (self-concept is based on perceptions of other's responses) is presume to hold under all conditions, but Postulate 3 (perception of other's responses are the same as those actual responses) provides the weak link in the chain of logic, and Kinch delineates conditions under which Postulate 3 will not hold.

> The evidence seems to suggest that the accuracy of Postulate 3 varies with (1) the individual's familiarity with the others, (2) his familiarity with the situation, (3) the social visibility of the situation, (4) the individual's past experience in interpersonal situations, and (5) other factors which relate to all types of perception (condition of body, immediate past, etc.) (Kinch, pp. 483-4).

These variables are the specific empirical qualities which affect the congruence of a self-concept and the concept others hold of that self.

Bem (1972) delineates four distinct ways in which self perception can differ from the perception that others have of that self. Because he does not elaborate as to the importance of each way, they will be presented here with no importance being implied in the order in which they appear.

The "Insider vs. Outsider difference" (Bem, p. 40) involves all the internal bodily stimuli to which the self has access but other people do not. Through these stimuli the Insider often attributes qualities which are undetectable from the outside. For example, the Insider may realize a strong internal effort to succeed at solving a problem, but the Outsider, seeing only negative results, may wrongly infer the quality of laziness.

The "Intimate vs. Stranger difference" (Bem, p. 41) involves the historical information which is available to the Intimate but frequently unknown to the Stranger. Thus, while the Stranger may infer dispositional qualities based on one sample of a particular behavior, the Intimate will have a whole life history of sample cases to draw on. If this one particular case is at wide variance with the rest of the historical cases, then the Stranger is likely to make an incorrect attribution toward the Intimate.

The third difference is that of "Self vs. Other" (Bem, p. 41). This difference takes into account the motivations of the self ". . .to preserve esteem or defend against threat" (Bem, p. 41). Defense mechanisms are one example of processes which are used to distract valid self-perceptions and render them at variance with perceptions of others.

The last difference is that of "Actor vs. Observer, in which different features of the situation are differentially salient to them" (Bem, p. 42). Since Bem recognizes that this difference is based on attribution theory, the following discussion will further clarify this issue.

In delineating attribution theory, Jones and Nisbett (1972) note that ". . .context data are often quite different for actor and observer and that these differing data prompt differing attributions" (Jones & Nisbett, p. 83). The data which are essential to the attribution process are separated into two main categories, cause data and effect data.

Two types of effect data (the nature of the act and its outcomes) are, by and large, known equivalently to both actor and observer because these data are objectively perceived from the environment. However, a third type (the actor's experience of the act) is less well known to the observer than the actor because the actor has direct access to internal emotional states. By contrast, the observer has only indirect access to those states through observation of the physical appearance of the actor. (Of course, the use of defense mechanisms on the part of the actor can distort the perception of internal states.)

Cause data can be divided into two types--environmental motivations and personal intentions. Again, actor and observer have fairly equal access to environmental causes (task difficulty,

outside incentives, etc.), but only the actor can know his/her

true intentions. ". . .as with feeling states, knowledge of

intentions is indirect, usually quite inferior, and highly sub-

ject to error" (Jones & Nisbett, p. 84).

Jones and Nisbett (1972) include a third type of data

which is typically known only to the actor--historical data.

Whereas the observer frequently infers a dispositional quality to

an actor because of a single observance of that actor, the actor

will be reluctant to infer dispositional causalities if that

particular sample of behavior is atypical of his/her previous

life.

Although the differences between actor and observer just

cited are important, the most important contribution they make to

recognizing differences lies in what Bem calls the Actor vs.

Observer difference. Whereas the other differences involved the

extent and accuracy of data known to actor or observer, this last

difference involves the way that information is processed--

> . . .important information processing differences do
> exist for the basic reason that different aspects of
> the available information are salient for actors and
> observers and this differential salience affects the
> course and outcome of the attribution process (Jones
> & Nisbett, p. 85).

The most important variable in this process involves the

fact that ". . .the action itself--its topography, rhythm, style,

and content--is more salient to the observer than to the actor"

(Jones & Nisbett, p. 85). Thus, the observer's main attention
is on the actor while the actor's concentration is on the environ-
ment.

> The actor should perceive his behavior to be a
> response to environmental cues that trigger, guide, and
> terminate it. But for the observer the focal, com-
> manding stimulus is the actor's behavior, and situa-
> tional cues are to a degree ignored. This leaves the
> actor as the likely causal candidate, and the observer
> will account for the actor's responses in terms of
> attributed dispositions (Jones & Nisbett, p. 85).

Jones and Nisbett further buttress their argument by referring to

the differences between primary qualities (those which lie in the

perceived objects) and secondary qualities (those which lie in the

perceiver). Since even adults do not normally fully recognize

this distinction between primary qualities and evaluations, most

incoming information about perceived objects is routinely processed

as constituting primary qualities about that object. Thus,

> . . .the actor will experience his behavior as proceeding
> naturally from the attractions, compulsions, and
> restraints in his environment. For the observer, it is
> not the stimuli impinging on the actor that are salient,
> but the behavior of the actor. The observer will there-
> fore tend to see the actor's behavior as a manifesta-
> tion of the actor, as an instance of a quality processed
> by him (Jones & Nisbett, p. 86).

These differences in information processing are important to under-

standing disagreements in self-perception by the actor and per-

ceptions of the actor by the observer by noting that ". . .the

actor will over-attribute his behavior to the environment and

the observer will over-attribute the behavior to qualities of the actor" (Jones & Nisbett, p. 87).

Attribution theory states that actors pay attention to situational determinants of their own behavior while observers pay attention to enduring qualities which reside within the actor as the determinant of that same behavior. These two points of view have much to do with the current controversy in personality theory as to whether behavior is governed by situational determinants or consistent, structural traits within each individual.

That trait theories of personality have enjoyed tremendous popularity within the field of psychology is evidenced by the number of trait theories which have been developed over the years and by the amount of research devoted to them (e.g. Maddi, 1968). The assumption which is inherent in each of these theories is that personality is basically a structured, unchanging entity and that there are consistencies in behavior which are representative of these structures. Allport (1976) still adheres to the concept of trait after having spent four decades studying the construct. Stagner (1976) presents both theoretical and empirical evidence supporting the concept of trait consistency. In spite of this support, trait theories of personality have come under attack in recent years. Mischel (1968) reviewed a tremendous amount of research and concluded that very little behavioral consistency had been found. Instead, it appeared that behavior

was governed not by internal traits but rather by external

demands of the situation. Furthermore,

> . . .on virtually all of our dispositional measures of
> personality substantial changes occur in the charac-
> teristics of the individual longitudinally over time
> and, even more dramatically, across seemingly similar
> settings cross-sectionally (Mischel, 1969, p. 1012).

These recent criticisms of the concept of trait and the

subsequent rise in theoretical importance of the situational

influence in personality assessment have revealed the impor-

tance of each in the determination of personality. This state of

affairs has revealed itself in the relatively recent research

paradigm known as the person by situation interaction. Instead

of looking at only the hypothesized underlying structure of the

personality or only the environmental conditions, both these

factors are now being taken into account.

> . . .this recognition of continuity (in individual per-
> sonalities) exists side by side with the equally com-
> pelling evidence that complex human behavior is
> regulated by interactions that depend intimately on
> situational conditions (stimulus variables) as well as
> on dispositions (Mischel, 1977, p. 334).

The first implication of this controversy for per-

sonality assessment is that self-report data will tend to over-

emphasize the situational determinants of behavior, especially

when external stimulus conditions can "explain away" memories of

undesirable personal behavior. Thus, self-report data may be at

variance with the true personality due to the particular point

of view of the self.

The second implication deals with an observer's ratings of the actor. To the extent that the observer has had little contact with the actor, he/she may tend to make inferences of the existence of particular traits based on too few confirming behavioral manifestations of that trait. The observer may tend to rate the actor based on little-researched inferred traits.

Summary: Influence of others on self-perception. Mead's explication of the theory of symbolic interactionism takes the most radical position in favor of the influence of others on self-concept. According to Mead, self-awareness is not even possible until that person takes the point of view of the other, and in the process, that person self-describes personal attributes and qualities to the self which he/she perceives the other to hold of him/her. Mead simply does not allow for the possibility of self-evaluation or the development of a self-concept outside the context of another person's viewpoint.

Festinger takes the position that others can be influential in the self-evaluation process but does not ascribe to them any special degree of influence. In fact, of the two criteria which influence self-concept (objective, non-social means and social means), Festinger believes that the objective criterion is the preferred means of self-evaluation. However, Festinger does note that self-evaluations apart from both types of outside

criteria are unstable, and stability or increased confidence in self-evaluation only occurs when those attributes have been compared with an outside criteria.

The theories of Duval and Wicklund and of Bem take a similar position with respect to the influence of others on self-concept. To the extent that the self is in the same position as others in being an active observer of his/her own behavior, the self should arrive at similar conclusions regarding personal self-concept as do others. However, these theorists differ from both Mead and Festinger in that self-evaluations are seen as needing no bolstering from or reference to others' concepts of that self in order to be stable or accurate.

Attribution theory takes the extreme opposite position to that of Mead. Actors and Observers are believed to pay attention to different aspects of a given situation, and as a result, they attribute causes of the actor's behavior to different characteristics of the actor. Observers tend to attribute those causes to broad dispositional traits of the actor while the actor sees him/herself as responding to the limitations and needs of the environment. Obviously, the reciprocal influence of actors and observers on the actor's self-concept is nil, and their concepts of the actor's self will be at variance with one another.

It is interesting to note the results of a study by
Schoeneman (1981) in which he inquired of 160 undergraduates
through questionnaires and interviews which of three methods led
to their perceptions of self-characteristics: self-observation
(Bem, and Duval and Wicklund), social feedback (Cooley and Mead),
and social comparison (Festinger). The ratio of responses was
7:2:1, respectively, a result which clearly supports self-
observation as the main avenue of self-perception.

Summary: Congruence of self and others' views. Mead's
analysis of self-concept implies that self-concept is derived
from that concept of self which is held by the generalized other.
Thus, to the extent that the self accurately perceives that con-
cept held by the generalized other (and Mead makes no indication
that the perception will be at odds with reality), self-concept
and the concept held by the generalized other will be the same.
Although Mead does not elaborate on differences between specific
relationships, he does recognize that the presentation of self
varies with the particular other in the relationship.

Kinch takes symbolic interactionist theory a step further
and delineates some conditions under which the perceived concept
that others hold will be at variance with self concept. These
conditions are enumerated on page 17 and will not be repeated
here. The significant point is that the variance is theorized to

occur only through the inability of the self accurately to perceive the responses of the other. The assumption that others fully determine self-concept remains uncontested.

The most explicit discussion of the differences between self-perception and interpersonal perception comes from Bem. He has classified the causes of those differences into four categories: 1) feelings and simuli within the body to which only the self has access, 2) past personal behavior known only to the self, 3) threats to the self which result in self-deception through defense mechanisms, and 4) the difference in perspective between actor and observer.

Bem's final category is a recognition of the basic tenet of attribution theory. Jones and Nisbett demonstrated that actors (selves) tend to attribute causes of their behavior to environmental determinants and constraints while observers (others) tend to attribute causes of that same behavior to dispositional, stable traits of the actor. The result of this difference is that observers quickly arrive at rather steadfast conclusions about the structure of an actor's personality based on a small (perhaps biased) sample of his/her behavior. On the other hand, actors are hesitant to self-ascribe personality traits and much more likely to see their behavior at the mercy of situational determinants.

Empirical Findings

Empirical research in the general area of agreement between self-perception and perception of that self by others has focused on only one "significant other" at a time. Thus, although more information would be gained by analyzing the views of several "significant others" for each "self," research strategies up to this time have limited themselves to investigations of self-other differences where the "other" is represented by only one type of relationship, e.g. "close friend." [A very few of the studies (e.g. Jorgensen, 1967; Gray & Gaier, 1974) to be reviewed did include two kinds of "others," but these are the rare exceptions.] Since the degree of self-other agreement found appeared to vary most significantly along the lines of who these "significant others" were and the present research is aimed toward analyzing differences in self-other agreement according to the type of self-other relationship, the empirical literature will be presented according to the "significant other" employed in each particular study. Some of the studies reviewed here have been listed in a review of self-other agreement studies by Shrauger and Schoeneman (1979).

The types of relationships examined in this section fall under the following headings: close friends, friends, parents-children, peers (close contact), peers (not well known), and peers

(children and adolescents). The "peers" categories include all those studies in which the self-other relationship was not specifically chosen because of a known friendship or intimate relationship. Thus, the order of presentation of the categories is in terms of decreasing amounts of intimacy or opportunity for getting to know one another in the self-other dyad. [Blumberg (1972) reported that personal evaluations were communicated most often and that more information was revealed between friends than between nonfriends.] The underlying assumption in this order of presentation is that the more intimate and revealing a relation-ship is, the more self-other agreement will be found because the self will be more fully revealed to the other.

Close friends. Several studies chose to look at the relationship between subjects' self-perceptions and the percep-tions that the subjects' best or closest friends have of them. Because close friends have an intimate and mutually revealing relationship, a person should reveal honest self-perceptions of emotions, thoughts, and desires to a close friend. Thus, a self and a best friend should have consistent views of that self (although both may be inaccurate).

A study of self and closest friends' ratings of adjust-ment (as measured by the Bell Adjustment Inventory, Adult Form) was carried out by Winthrop (1959). Since this particular inven-tory allows for a response of "?" to any item (meaning that image

uncertainty exists in the mind of the responder), two types of scores were calculated. Nonadjusted scores included all data as recorded (including responses of "?") while adjusted scores reflected responses on those items for which image certainty existed for both self and friends. The correlation between self and friends' ratings for nonadjusted scores on overall adjustment was .19 (n.s.) while correlations for four subscales ranged from .29 (p < .05) to .56 (p < .01). Adjusted score correlations were even higher--the range was from .41 to .66 (p < .01). Another interesting result of this study was that significantly more image uncertainty existed on the part of close friends than for selves (t = 4.54, p < .01).

Scott and Johnson (1972) employed 50 undergraduates in a study designed to assess nine personal needs or motives (achievement, activity, affiliation, cognition, creativity, dominance, contemplation, privacy, and self-punishment). Since the overall purpose of the study was to examine the comparative validities of indirect and direct measures of personality, each of the fifty subjects was assessed by three methods--self-report (direct), TAT (indirect), and report by close friend (validation criterion). The self-report instrument was constructed specifically for the study and consisted of Likert-type items. These same items were used to construct the instrument used by the close friends. Correlations between the self-report scores and close friend-

report scores for the nine needs or motives ranged from .22 to
.55, and the mean correlation was .38 (for all but the lowest
correlation, p <.05). The range of correlations between the
self-report and TAT scores ranged from -.21 to .32 with a mean of
.05 (only .32 was significant, p < .05). Thus, significant
agreement was found between selves and best friends in assessing
the needs of the self, while much less agreement was found between
the indirect assessment and direct self-report methods. Though
Scott and Johnson's only hypothesis was that direct assessment is
more valid than indirect assessment, their results suggest two
important ideas: 1) selves and best friends can agree significantly
on assessing needs or motives of the self, and 2) the type of
instrument used can play a significant role in assessing that
agreement.

Gray and Gaier (1974) tested seven female high school
seniors and their two named best friends. The Q sort technique
was used to obtain self and best friends' ratings of self on 100
positive and negative traits. Correlations obtained between self
and best friends' ratings of self ranged from .438 to .963 with a
mean of .761. Thus, a high degree of agreement was found between
the two ratings.

In summary, the empirical literature indicates that selves
and close friends tend to have convergent perceptions of attributes
related to that self. Probable reasons for this close agreement

are that a person tends to be more honestly open with best friends than others in general and that close friends will tend to spend more time together (a necessary condition to be able to know someone).

Friends. Some studies involved the agreement in perceptions between selves and friends but did not specify that these friends were special in the sense of being a best friend.

Eisenman and Robinson (1968) did a study of 10 female and 7 male institutionalized, physically disabled adults who knew one another well. (Even though the authors do not indicate that this group consisted of mutual friends, they do state that the patients knew one another well.) Each subject was asked to rate him/herself for creativity on a 1 to 7 scale (1 being highest and 7 being lowest) and to indicate the three most creative members of the group. The Spearman rank-order correlation (rho) with a correction for tied ranks between the self-ratings and friend-ratings was .74 (p < .001). Interestingly, a measure of creativity involving the preference for complexity (polygon preference) which was also administered to the subjects correlated significantly with both self-ratings (rho = .56, p < .05) and with friend-ratings (rho = .58, p < .01). Thus, the self- and friend-ratings demonstrate construct validity when using the polygon preference test as the criterion.

Manis (1955) reports a longitudinal study in which the self, a friend, and a nonfriend (dorm-mate) rate the self on eight personality traits (the author did not specify which eight) derived from Cattell's factor analysis of Allport and Odbert's adjective trait list. Subjects were 101 male undergraduates who lived in a dormitory together, and ratings were taken six weeks apart. The author claimed that the longitudinal results showed that self and friend's descriptions were significantly closer at the final test than the initial test. (Although no inferential statistics for these data were reported in the published study, the author reported a significance level for this result of $p < .05$.) In addition, the author claimed that increases in agreement between friend and self were significantly greater ($p < .025$) than increases between self and nonfriend. (For this result he used Wilcoxon's Signed Ranks Test.) These results suggest that, at the end of a relatively short period of time of contact, friends will more closely agree with a person's self-perception than will non-friends. Also, self and friends' perceptions will tend to converge over that same period of time.

A dissertation by Todoroski (1972) involved a study of self-acceptance and acceptance by peers. Peers were further divided into two categories: peer-intimates and peer-nonintimates. Though no data were reported in the dissertation abstract, Todoroski claimed that her study indicated that, on ratings of

1) acceptance by others, 2) expectancy of being accepted, and 3) acceptance of others, peer-intimates' ratings were significantly closer to the self ratings than were peer-nonintimates' ratings.

A study of attitudes was reported by Scott and Johnson (1972). The procedure involved 234 male undergraduates who were asked to fill out a direct report questionnaire which would reveal their attitudes on a variety of social issues. Each subject then selected two friends, each of whom completed the questionnaire based on what each believed the subject thought about each issue. Correlations between self and friends' ratings on these 14 issues ranged from .14 to .51 (for all r's, $p < .05$, one-tailed test).

Funder (1980) employed the California Q-sort (a set of 100 descriptive personality statements which are rank-ordered by the subject) in looking at two types of self-other agreement: 1) the correlation between self and others' ratings, and 2) the degree to which the mean values of self-ratings agree with the mean values of others-ratings. Subjects (self) were 41 Stanford undergraduates, and "others" were friends or roommates. Of 100 personality trait descriptions, the total number of items which demonstrated a significant self-other r was 51--21 of the self-ratings correlated significantly with friend-ratings at $p < .05$ (two-tailed, $.32 < r < .39$), 17 at $p < .01$ ($.40 < r < .48$), and 13 at $p < .001$ ($.49 < r < .68$). Ninety-four of the 100 correlations were positive, and none of the six negative correlations was significant. However, even though this data demonstrates many

significant correlations, it should be noted that even the highest

correlation represents accounting for less than half the variance

$[r^2_{highest} = (.69)^2 < .48]$. Using the $\underline{t}$ test for correlated means,

Funder found that 14 of the differences between self and

others' mean ratings were significant at p < .01, and 8 were

significant at p < .05. Interestingly, Funder found no significant

relationship between an item's self-other correlation significance

and self-other difference significance $(\chi^2 = 1.21,$ n.s.). The

correlation between self-other mean differences and self-other

correlations is also nonsignificant, r = -.01. Thus, there appear

to be at least two independent types of agreement to look at:

covariation of responses and actual differences in mean responses.

Mayo and Thomas (1978) found that correlations between

self and friends' scores on an inventory of three personality

traits (to be discussed more fully in a later section) were less

than the correlations between self and spouse scores. Thus, the

characteristics of intimacy and openness of a "friend" relation-

ship may be amplified in the "spouse" relationship and lead to an

even greater congruence of self and other views.

This scant research on self and friends' ratings of the

self indicates that there is agreement between the two. However,

it appears that there may be less agreement between selves and

friends than between selves and best or close friends. The Manis

study indicates that length of relationship may be a more salient

factor in self-friend convergence of ratings than in self-nonfriend (peer) convergence.

Parents-children. The usual close contact between parents and children would appear to indicate that a high degree of agreement would ensue between a child's self-evaluation and the parent's evaluations of that child. Research bearing on this relationship is presented here.

A study of 100 adolescents and their parents by Bledsoe and Wiggins (1973) showed differences in parents' concepts of the child and the child's self-concepts. The instruments used (Gordon's "How I See Myself" and a special version for parents called "How I See My Child") had been factor analyzed as measuring seven dimensions--physical appearance, physical adequacy, autonomy, teacher-school relationships, academic adequacy, interpersonal adequacy, and emotions. Item responses were calculated to yield factor scores which ranged from 1 (unfavorable) to 5 (favorable). The authors hypothesized that parents would perceive the children as more favorable than the adolescents saw themselves, and for all factors, parents did see their children as more favorable than the children saw themselves. An analysis of variance revealed that two of the differences were statistically significant--physical appearance ($F_{1,298}$ = 21.4, p < .001) and autonomy ($F_{1,298}$ = 6.65, p < .05). In addition, none of the differences between mothers'

and fathers' factor scores was significant, a fact which implies that either mother or father may represent a "parental" view (one of the research hypotheses).

Kenrick and Stringfield (1980) had 81 undergraduates complete a self-report inventory composed of 16 7-point bipolar adjective scales based on Cattell's 16 personality factors [Cattell, 1966(a)]. One parent (mother or father) and one peer (usually roommate) also completed the inventory based on their impressions of the subject's personality. The overall correlation between subjects' and parents' responses was .26 (p < .05) with a range from -.06 to .45 for each trait considered individually. Similar results were obtained for both the parent-peer and self-peer correlations.

Gray and Gaier's (1974) previously cited study also involved the relationship between the child's perception and both parents' perceptions of positive and negative traits applicable to the child. Correlations between those perceptions had a mean of .738 with a range from .656 to .803. No results of significance tests were reported, but these correlations seem to indicate a high degree of agreement.

The research on parent-child agreement in perceptions of the child is scant and contradictory. The primary reason may be that adolescents are less likely to demonstrate consistent, traitlike behavior than are adults, as they are in the process of

finding out who they are and where they fit into society. The results presented here range from practically no agreement to very high agreement. Thus, no hard and fast conclusion may be drawn.

Peers. The research literature on the agreement between self-perception and perception by peers will be presented in three parts according to the relationship between the self and peers. The first part deals with peers who were either roommates of subjects or were purported by the research to have been in close living and/or working contact with the subject. In other words, the relationship was not described as one between friends but had elements of extended close personal contact. The second section involves unrelated college students whose peers were classmates or who were otherwise not well known to the subjects. The third part presents research performed with children or adolescents and classmates.

(1) Close contact. The research evidence indicates a tendency for agreement between self-perceptions and perceptions by others when the other have been in close contact with the self. Carroll (1952) used as subjects 125 Army enlisted men who had been quartered together for four months (six to a room). Using a measure of introversion-extraversion, Carroll reported zero-order correlations between peer-ratings and self-ratings on

corresponding traits ranging from .29 to .59. Webb (1955), in a study of 105 Naval Aviation Cadets who had close, constant, daily contact with one another, reported an r = .43 for self- and peer-ratings of intelligence.

Reeder, Donohue, & Biblarz (1960) studied 54 enlisted men who had been in close working and living contact for several months. The group was asked to self-rank and rank other members along the lines of leadership ability and work ability. The hypothesis being tested was that self-rankings and peer-rankings should be similar. Although the reported data showed that subjects who rated themselves highest on these two constructs were also rated highest by peers, medium self-raters were rated medium by others, and low self-raters were rated lowest by the group, no significance tests of the differences were performed, and these results should be viewed as tentative. Israel (1958) involved 29 student nurses who lived and studied together in an investigation of self-ranking and peer-ranking of perceived leadership, intelligence, appearance, and orderliness. Israel hypothesized that high, medium, and low self-raters would be ranked in the same manner by others. Results of a one way ANOVA showed a significant difference in peer-ratings in the hypothesized direction for intelligence and leadership (for both, p = .02) but nonsignificant differences for appearance and orderliness. In a similar study, Lomont (1966) studied 136 sorority and fraternity

members on self- and peer-ratings of love-hate and dominance-
submission measures of personality. He found no significance
difference between self- and peer-ratings for either dimension.

Despite these tendences toward self-peer agreement,
other studies demonstrate that agreement between friends is
stronger than agreement between peers. Todoroski (1972) employed
177 sorority members in a study of actual acceptance by others
and expected acceptance by others. The author claimed that sig-
nificant differences were found between the agreement of self
and peer-intimates and the agreement of self and peer-nonintimates
--". . .a sorority girl predicts more accurately ratings given to
her by her peer-intimate than by her peer-nonintimates" (Todoroski,
p. 2360-B). This study provides evidence that interpersonal
closeness is an important variable in the degree of self-other
agreement. Funder (1980) attributes the self-other agreement in
his study in part to the fact that his subjects knew one another
well as friends, and Manis (1955) also found greater self-other
agreement between friends than between nonfriends.

(2) Not well known. Research which employs selves and
others who do not know one another well generally finds little
agreement between the self and the other. Rokeach (1945) studied
the concept of physical beauty through ratings of subjects'
beauty by self and by others in the study. Ratings were made on
a scale of 1 to 10 with 1 being the low end of the scale and 10

being the high end. Each subject rated herself and was rated by every other subject. The subjects were 143 undergraduates whose main source of mutual contact was through one class at college. Significant differences were found between a woman's self-rating and the average rating given to her by others--subjects consistently rated themselves more beautiful than others rated them. Fey (1955) used 58 medical students in a study of self-perceptions of acceptability to others and actual acceptability to others. The authors assessed perception of acceptability to others by a self-report instrument composed of 45 Likert-type, 5-point items. One scale of 15 items (e.g. "People are quite critical of me") pertained to estimated acceptability to others while two other scales (each with 15 items) assessed self acceptance and acceptance of others. After completing the questionnaire, each subject was asked to list the five classmates he/she liked best. From these data, actual acceptability to others was determined as the number of classmates who chose him/her. The authors reported that estimated acceptability to others and actual acceptance to others were totally unrelated (r = .00). Cogan, Conklin, & Hollingsworth (1915) employed 50 undergraduates in a study of self-ratings and other-ratings of nine personality characteristics. Each member of two groups of 25 undergraduates was asked to rank herself and the other 24 members of her group as to each of the characteristics--neatness, intelligence, humor, conceit, beauty,

vulgarity, snobbishness, refinement, and sociability. The authors published the average deviation of self-rankings from ranking by others for each characteristic (range from 5.1 to 7.3 deviations) but did not report any tests of significance.

Miyamoto and Dornbusch (1956) report a study of 195 subjects, 132 from introductory classes in sociology, and 63 from two fraternities and two sororities. Measures of self-esteem and esteem held by others were taken as defined by the constructs of intelligence, self-confidence, physical attractiveness, and likableness. The rating methods were simple--subjects rated themselves on a scale from 1 to 5 on how they perceived themselves on each of the four constructs and then rated all others in the group (10 groups in all) on the same four constructs. The authors hypothesized that those subjects with the higher mean self-ratings of self-esteem would also have higher mean other-ratings of esteem. Although the authors did not report the results of any significance tests, they claimed that, for the four constructs considered across all ten groups, the hypothesis was supported 35 out of 40 times. Schneider (1970) also reported a positive association between self-ratings and other-ratings for 240 subjects drawn from an introductory psychology pool. The measured constructs were prominence, achievement, affiliation, and leadership with correlations between self and peer ratings ranging from .25 to .51 ($p < .05$). Interestingly (and contrary to expectations),

these correlations are all <u>less</u> than the correlations between self-ratings and ratings made by an objective, totally known observer.

Manis (1955) attempted to control for the amount of contact with friends and nonfriends by requiring both to be roommates of subjects in a study of 101 male undergraduates. Analysis of ratings on 12 relatively independent personality factors revealed differences between friends and nonfriends' ratings as compared to self-ratings. Over a period of six weeks, self-ratings and friends' ratings were found to converge more than self-ratings and nonfriends' ratings ($p < .025$). Thus, length of relationship appears to be a more salient variable in self-friend agreement than in self-nonfriend agreement.

(3) Children and adolescents. Research involving high school and younger students tends to demonstrate little self-other agreement within this age grouping. In a correlational study of motivational dispositions and behavior, Jorgensen (1967) reported no consistent agreement between self-ratings and peer-ratings of several personality traits and attitudes of third graders. The author concluded that ". . .peers do not rate motivational and behavioral dispositions in the same way that a child perceives them" (Jorgensen, p. 3315A). Additionally, teachers made the same ratings, and there was no significant agreement between teacher-perceptions and self-perceptions. Breslin (1961) studied 28 moderately to severely handicapped

children ranging in age from 10 to 16, and a positive but nonsig-nificant correlation between self [from a scale developed by Lipsett (1958)] and likability by peers (from the Peer Nomination Inventory) was found. Horowitz (1962) analyzed results from 111 fourth, fifth, and sixth graders on self-concept (from the Children's Self-Concept Scale) and popularity as ranked by peers and found a significant r for fourth graders (r = .55, p < .01) but nonsignificant correlations for fifth and sixth graders (r = .18, n.s.). Orpen and Bush (1974) reported a lack of congruence between self-image and public image on the traits of Sociability and Responsibility for 14 high school males. A graphic rating scale and the Sociability and Responsibility subscales of the CPI were used, and the resultant correlations between self-image and public were all nonsignificant (.01, .05, .32, .51, p > .05). A study by Tschechtelin (1945) revealed that, for a sample of 1,542 fourth to eighth grade students, children consistently rated themselves higher on 22 positive personality traits (from the Tschechtelin 22-Trait Personality Scale) than did their peers. Approximately one half of all the differences found were signifi-cant at the .01 level.

Goslin (1962) reported that self-acceptance was an impor-tant variable in his study of self-other agreement among 187 high school boarding students. Significant differences existed between self- and peer-ratings according to whether the subject self-accepted

and self-rejected, and those subjects exhibiting self-acceptance were more likely to agree with their peers as to the applicability to the self of 20 personality traits than were those subjects who self-rejected. Phillips (1963) found that an increase in age was associated with an increase in self-other agreement. A 10-item personality inventory was used with 96 third graders and 96 sixth graders. Correlations between self and others ratings were .00 for third graders and .40 (p < .01) for sixth graders, and the difference between these correlations was statistically significant ($\underline{t}$ = 2.8, p < .01).

The only study which clearly demonstrated that self-other agreement can exist between children was done by Amatora (1956). She used the Child Personality Scale to rate 22 personality traits on a sample of 200 boys and 200 girls from grades 4 through 8 (data were collapsed across grades). Of the 44 resultant correlation coefficients, 31 were significant at the .01 level (.19 to .67), 8 were significant at the .05 level (.15 to .17), and 5 were nonsignificant (.10 to .13). The author concludes that ". . .the child's own view of himself is in sufficient agreement with his overt behavior as judged by his peers" (Amatora, p. 125).

Summary. The trend of the empirical research indicates that the degree of self-other agreement depends on who the "other" happens to be and, to a certain extent, on who the "self" is.

The most consistent agreement is found between those people who are close friends--the large majority of the literature reviewed found significant agreement. Studies which used friends (but not close friends) also found general agreement but not as consistent as that involving close friends. The research on self- and parent-perception is contradictory probably because the adolescent subjects are in a very changeable period of life (Manaster, 1977) and parents tend to see their children only in the home environment and not in the adolescents' school or social environments. The research on self-peer agreement also appeared to vary along the familiarity dimension. Those peers who were in close daily contact with the subjects were more likely to agree with self-perceptions than were peers whose only contact with a self was during a college class. Finally, the research on adolescents and children indicates a clear lack of self-other agreement, a finding probably due to two main factors: 1) these young people are still in the developing period of life, and 2) the constructs or traits on which they make ratings mean different things to different children or else simply are not meaningful at all.

Using Kinch's three formalized postulates as derived from symbolic interactionist theory, it is interesting to note that many studies investigated not only self-other agreement but also the relationship of the self's perceived other's view. In other words, these investigations looked at the degree to which

self-concept agreed with the perceived other's view and the degree to which this perceived other's view agree with actual other's view [e.g. Goslin (1962), Orpen & Bush (1974), Miyamoto & Dornbusch (1956), Quarantelli & Cooper (1966)]. Highly consistent agreements are found between perceived other's views and self-concept, while many discrepancies are found between perceived other's views and actual other's views. In other words, people believe that other people agree with their own self-concepts when, in reality, that self-concept is at variance with other people's views of them. This research indicates support for Kinch's Postulate 1 but contradicts Postulate 3. Since Postulate 5 is a derivation of and dependent on the veracity of Postulates 1 and 3, then Postulate 5 should be unsupported, and, in general, the research pertaining to Postulate 5 is highly contradictory. The validity of Postulate 5 (and, in general, the degree of self-other agreement) depends upon the type and length of relationship between the self and other and, to a certain extent, the attaining of a certain age or maturity.

Self- and Other-Report Validity Issues

Introduction. The goal of self- and other-report personality inventories is to obtain a veridical assessment of a particular person's personality along specified dimensions. However, that goal is never unequivocably reached with any assessment

tool of this nature due to many varied factors. The following discussion of validity issues is intended to outline what those factors may be and how they interfere with the intended purpose of self- and other-report personality inventories.

Direct self-ratings versus self-reports. Kaufman and Murphy (1981) attempted to validate six nonstressful personality instruments [1) California Psychological Inventory, 2) Omnibus Personality Inventory, 3) Self-Descriptive Inventory, 4) Sixteen Personality Factor Questionnaire, 5) Adjective Check List, and 6) Edwards' Personal Preference Schedule] in a study involving 203 undergraduates. Although the authors do not specify by name what kind of validity they were trying to establish, construct validation appears to have been their goal since the procedure involved correlating results of the six instruments with two measures of the same constructs underlying the six instruments-- a direct self-rating and rating by a close friend. (Even though the six instruments are also self-report in nature, the direct self-rating and rating by close friend were different in that these two were simply composed of point blank questions as to the applicability of the trait in question on a 7-point scale.) Validity coefficients for these personality tests using direct self-ratings as the criterion ranged from .25 to .56 (all significant at the .05 level). Validity coefficients for the six tests using other-ratings as the criterion did not do as well--only two

were significant (.30 with OPI and .37 with SDI). However, correlations between the direct self-ratings and other-ratings were consistently higher than those correlations between the six self-reports and other-ratings, and the authors conclude that ". . .ratings by friends on the personality dimensions used in this research could be considered a valuable source of personality information in a counseling setting" (Kaufman & Murphy, p. 88).

Hase and Goldberg (1967) studied the (construct) validity of six different scale construction strategies--1) factor analytic, 2) group discriminative, 3) intuitive-theoretical, 4) intuitive-rational, 5) stylistic-psychometric, and 6) random. The procedure involved taking a common item pool consisting of all those items comprising the California Psychological Inventory and deriving 6 sets of 11 scales (one set for each strategy). Most sets measured a number of common characteristics. Two hundred and one college freshwomen then took the CPI and also self-rated on five traits (using a 5-point forced-distribution system)--dominance, sociability, responsibility, psychological-mindedness, and femininity. In addition, all subjects were rated by 8 to 12 peers on each of these five dimensions. Because the authors used the direct self-ratings as the criterion for valida-tion of the six strategies, the unstated assumption was that the direct self-ratings (as opposed to the newly constructed self-reports) were accurate measures of the five stated traits. If

that is true, then their finding that the direct self-ratings consistently correlated more strongly with the peer-ratings than with any of the derived scale scores implies that peer-ratings are superior to self-report scale scores (mean correlation of empirical scale scores with self-rating, .24; mean r of rational scale with self-rating, .33; mean r of peer-rating with self-rating, .43; however, no significance tests of the differences between these correlations were reported). Carroll (1952) and Peterson (1965) also provide evidence for the superiority of direct self-ratings over self-report instrument scale scores using peer-ratings as the criterion.

One possible reason behind the Hase and Goldberg findings could be that the newly derived scales were ambiguous or unclear to a certain extent due to misidentification of the scales, whereas the direct self-ratings and peer-ratings explicitly asked for what they were measuring. On the other hand, it is possible that the newly derived scales were actually more accurate in their assessment of the traits in question, and the lower correlations between these scale scores and direct self-ratings were due to the invalidity of the direct self-ratings. In turn, the higher correlations between the direct self- and peer-ratings could be due to shared response sets or mutual misperceptions of the self.

Number of ratings by others. The validity of other-ratings is dependent to a certain extent on the reliability of

those ratings because a less reliable measure can not correlate as highly with an external criterion as a more reliable measure. Thus, the more reliable an other-rating is, the more valid a measure it is (to the extent that it has validity at all). Since Winer (1962) notes that the reliability of ratings by judges increases up to a theoretical asymptote as the number of judges increases and that the absolute increase in reliability decreases as the number of judges increases, then an other-rating which is a composite of several other-ratings should be more reliable and thus a potentially more valid predictor than an other-rating based on a single observer. Although one could conceivably apply the correction for attenuation of a validity coefficient when dealing with a measure of low reliability, it is more desirable to have a reliable measure as evidenced by the data than to shore up its inadequacies through a correction formula. Horowitz, Inouye, & Siegelman (1979) empirically tested this theoretical claim of increased reliability and validity with increasing numbers of raters in a study of 10 clinicians' ratings of discomfort and depression exhibited by a client. Results indicated monotonically increased reliabilities with increased number of raters (though no tests of significance were made) and a resulting increase in validity with the theoretical expectations giving an excellent fit to the data.

Sources of measurement error. Errors of measurement
include all those elements of responses which are dependent upon
factors other than the underlying criterion of the measure being
studied. Some of these errors have been identified as response
styles or sets (tendencies to respond to the structural elements
of the test rather than the content of the item) on the part of
the rater (Cronbach, 1946, 1950; Edwards, 1957), but, as
will be shown, these confounding elements can exist on the part
of the rater, ratee, or the instrument. Because these sources of
error are relevant in varying degree to particular assessment
instruments, the full implication of each of the following factors
will be discussed in a later section in terms of the present
research.

(1) Self-disclosure and self-presentation. Johnson
(1981) investigated the validity of self-report measures of
personality by looking at the response sets of self-disclosure
(factual communications about the self) and self-presentation
(answering in terms of how one wants to be regarded by others).
Obviously, if responses are governed by self-disclosure, then
the test actually reflects that person's evaluation of self.
However, if self-presentation is the governing response set,
then the test's validity will be lowered to the extent that the
way one wants to be regarded is different from the way one
actually is. Johnson reasoned that response consistency

(responding with the same answer to an item presented twice) would correlate with specific traits according to whether that person used a self-disclosure or self-presentation response set. Response consistency from a self-disclosing person should be a result of characteristics such as responsibility and honesty, whereas response inconsistency should result from a person who is dishonest (although Johnson appears not to recognize that a dishonest person is by definition not self-disclosing) or behaviorally inconsistent. According to the self-presentation view, response consistency is a result of sociability, social awareness, and the ability to take the perspective of others whereas response inconsistency is a result of introverted tendencies, social isolation, or ill-defined social standards. Although Johnson did not provide a rationale for the particular subjects used in his study, a total of 155 normal adults, 69 murderers from Maryland State Penitentiary, and 45 students were employed. Response consistency was measured by the number of times that a consistent response was given to 12 items which occurred twice on the CPI. The self-disclosure predictor variables were the Responsibility, Socialization, Self-Control, and Flexibility scales of the CPI for the first two groups and the Self-Control, Lability, Order, and Change scales of the Adjective Check List for the third group. Self-presentation predictor variables for the first two groups were the Dominance,

Sociability, Social Presence, Self-Acceptance, and Empathy scales from the CPI. Of the 12 correlations between consistency and the self-disclosure variables, 5 were in the direction opposite to prediction, and none reached statistical significance. Of the 17 correlations between consistency and the self-presentation variables, all were in the predicted direction, and 10 reached statistical significance (range was from .20 to .75 for the significant correlations). Although Johnson did not discuss the differences in correlational results for the three groups individually, it should be noted that the strongest correlations between consistency and the self-presentation variables were found in the group of 69 murderers (certainly not representative of most people who complete self-report personality inventories). Nonetheless, these results demonstrate that self-presentation can be a hindrance to obtaining veridical results in self-reports.

(2) Social desirability. A long-recognized response set which is related to self-presentation is that of social desirability. When people are asked to complete a personality inventory on themselves or on someone they know, a typical response set is to give greater weight to those characteristics, traits, abilities, etc. which appear the most socially desirable to the rater, i.e. they try to make themselves or friends "look good." Thus, the inventory becomes more and more invalid to the extent that it measures socially desirable responses rather than

the underlying dimension it is supposed to be measuring. Edwards (1957) notes three approaches to eliminate the influence of this factor from personality measurements: 1) use items which are neutral with respect to social desirability, 2) use items imbedded in the test which measure social desirability alone and utilize this subsequent scale score to correct the scores on the other scales for this tendency, and 3) scale items for their social desirability and pair these items in a forced-choice format.

Funder (1980) found that, in a study of self-other agreement between friends on personality traits, the higher a trait was in social desirability, the more likely there was a high correlation between self and other scores ($r = .27$, $p < .01$). However, social desirability was not related to self-other mean differences averaged over 100 traits ($r = .11$, n.s.).

(3) Public and private self-consciousness. Public self-consciousness is a state of self-awareness which involves a focus on oneself as a social object whereas private self-consciousness involves a focus on one's personal emotions, thoughts, and moods (Scheier, Buss, & Buss, 1978). In relation to personality assessment, the theory holds that persons high in private self-consciousness will yield more valid self-assessments of personality than those low in private self-consciousness due to the former's access to true motives, thoughts, and feelings. Scheier et al.

found evidence in this direction in a study of self-reported aggressiveness and a criterion of aggressive behavior. Out of several hundred undergraduates tested, the authors selected 63 subjects from the top and bottom thirds of the distribution of private self-consciousness scores from the Self-Consciousness Scale (31 high-private and 32 low-private). Self-perception of aggression was determined by responses to 43 items of the Buss-Durkee Hostility Inventory. The empirical measure of aggression involved the average shock intensity administered to a fellow subject (actually a confederate of the experimenter) for mistakes made in a bogus experiment on concept formation. The correlation between self-rated aggressiveness and shock intensity was $r = .66$ ($p < .001$) for high-private subjects but only $r = .09$ (n.s.) for low-private subjects. The reported difference between these correlations was $z = 2.80$ ($p < .006$). A further hypothesis tested by these authors was that public self-consciousness would have no effect on the correlation between self-reported aggressiveness and the behavioral measure. The correlation for high-public subjects was $r = .38$ ($p < .01$) and that for low-public subjects was $r = .31$ ($p < .05$). The difference between these was nonsignificant ($z = .31$).

Interestingly, Turner and Peterson (1977) hypothesized that low-public self-consciousness would result in more veridical self-reports than high public self-consciousness. Forty-five

subjects were administered the Self-Consciousness Scale. Self-reports of expression of elation and anger were made through self-written stories and were rated by the experimenters. Laboratory measurements were made of expressions of anger and elation (no elaboration of procedures was given), and these two measures were correlated. For both anger and elation, correlations for low-public subjects were significant ($r = .46$, $p < .05$; $r = .47$, $p < .05$; respectively) while neither anger nor elation correlations were significant for the high-public subjects ($r = .05$, $.40$). However, no tests of significance between these correlations was reported. These authors also reported results for high-private and low-private subjects. For anger, the correlations were in the predicted direction, but for elation, the results were opposite to prediction. The authors concluded that self-report veridicality was moderated more by public self-consciousness than by private self-consciousness in their study.

The relation of these self-consciousness concepts to the response set of social desirability appears to be that publicly self-conscious individuals will be more likely to want to present themselves in a favorable light while privately self-conscious individuals will be more concerned about accurately presenting themselves. In addition, self-disclosing behavior is probably highly related to private self-consciousness while self-presentation behavior should be associated with public self-consciousness.

(4) Self-serving biases. Bradley (1978) reviewed the relevant research pertaining to self-serving biases in the attribution process and found consistent evidence to support its existence. The self-serving bias is a tendency for individuals to attribute positive behaviors to their own personal traits and to attribute negative behaviors to situational determinants. The motivation behind these attributions is interpreted as defensive actions required to sustain or enhance self-esteem. Self-serving biases have been shown to the elicited under the following specific conditions: 1) the individual's performance is public, 2) the individual feels responsibility for the outcome of his/her action, 3) the individual feels high ego involvement, and 4) the individual is objectively self-aware. In addition, counterdefensive attributions may result from a self-serving bias if the individual's subsequent repeated performance may be reassessed (i.e. a person may not accept undue credit for a positive outcome or deny blame for a negative outcome if his/her subsequent behavior might contradict a previous defensive attribution). In terms of responses to personality inventory items, people may tend to deny negative dispositional traits to themselves and overemphasize positive traits.

(5) Halo effect. A long recognized bias in performance ratings is that observers tend to rate an evaluee according to their overall impression of his/her merit, not according to the

various specific categories of performance (Thorndike, 1920;
Handy et al., 1980; King et al., 1980; Cooper, 1980, 1981). Thus,
intercategory correlations are spuriously inflated as the raters
respond to the evaluee's halo of performance, not the specific
features of that performance. Although the halo effect is
normally discussed in terms of performance ratings, other
researchers have noted a similar phenomenon in personality
assessment. For example, Bruner and Taguiri (1954) and Cronbach
(1958) have suggested that raters may not be responding to per-
sonality traits in the ratee but rather to how they generally
view the structure of personality. Thus, the raters may not be
responding to the specific personality structure of the ratee but
rather to the conceptual interrelationships of those traits held
by the rater. The result is that the rater places his/her own
"halo" around those traits which he/she intuitively perceives as
covarying.

Norman and Goldberg (1966) attempted to assess the
existence of this shared "implicit personality theory" on the
part of raters through a comparison of factor analyses of two
sets of data--one Monte Carlo and the other from a previous factor
analysis study. For the Monte Carlo data, a random-number table
was used to generate data for eight groups of seven hypothetical
subjects such that the expected value of the correlations between
the ratings of pairs of raters would be zero for each of the 20

scales. This requirement simulated the condition that the raters had no information about the ratees. Patterns of correlations among scales were common for all raters, a condition which simulates a shared "implicit personality theory" among the raters. Correlations of approximately .70 were chosen for pairs of scales representing the same cluster of "traits," and correlations of approximately zero were chosen for pairs of scales representing different clusters (this was done to simulate previous empirical findings). A score for each of the 20 scales was obtained for each "ratee" by averaging the ratings generated by the "raters." The scale scores were intercorrelated, and the resulting correlation matrix was factor analyzed using principal components followed by a varimax rotation. The factor loadings for each scale on the derived five factors were quite similar for the Monte Carlo data and actual data from a study of 82 senior fraternity men who had known one another for 1 to 3 years. (The authors reported only the highest factor loading for each scale, so comparisons involving the other four factor loadings for each scale were not possible.) In addition, the authors did not report any tests of significance for the differences in the reported factor loadings.

(6) Definition of judgment categories. Standardized responses (e.g. "Strongly agree," "Frequently," etc.) have different meanings for different people (Cronbach, 1946), and

difference in responses can reflect these differences in meanings rather than different judgments of the applicability of the item content. For example, Osgood (1941) reports that a 7-point scale is used in three primary ways: first, the extreme (1 and 7) positions only; second, the positions 1, 4, and 7; and third, the whole scale. Theoretical explanations for these differences include individual differences in critical thinking, personality differences in caution, or differences in word meaning (Cronbach, 1946).

(7) Trait observability. Attribution theory states that information is differentially salient for actors and observers--actors attune themselves to situational determinants while observers focus on the actor's traits. Kenrick and Stringfield (1980) hypothesized that this difference in perception would be reduced if the trait being measured were highly publicly observable to both the actor and observer and found a significant difference in self-other correlations between low and high publicly observable traits (p < .005). However, Funder (1980) reported that ratings of outward observability were not related to the correlation of self-other scores (r = .15, n.s.) but were related to the other-minus-self mean differences (r = .44, p < .001). This latter finding supported Funder's hypothesis that outwardly observable traits (about which the observer has direct information) would be rated by the observer as more

characteristic of the actor than the actor would indicate.
Thus, trait observability can be an important factor in producing
self-other agreement--inwardly observable traits (e.g. daydreams)
are more salient to the actor while outwardly observable traits
(e.g. is assertive) are more salient to the observer.

(8) Acquiescence and dissent. Two response sets which
are found in true-false test results are acquiescence (tendency
to respond "true") and dissent (tendency to respond "false").
Thus, to the extent that a person exhibited one of these
response sets, his/her answers would be reflective of his/her
response set tendency rather than his/her true score on that
test (Cronbach, 1946). Since response tendencies generally
become operative only when the question is to some extent ambi-
guous or the answer uncertain to the testee, acquiescence will
tend to make false items more valid and true items less valid
(dissent has the opposite effect). If a personality inventory
were to be constructed with true-false answers (or, conceivably,
applies-does not apply), then acquiescence will result in over-
estimations of the personality attribute whereas dissent will
result in underestimations. Nunnally (1978) claims that the
existence of these response sets as general personality traits
has not been substantiated in the literature.

(9) Tendency to gamble. Cronbach (1946) reports that
there exist reliable individual differences in the number of

items omitted from a test (where omissions are allowed). Thus, when two people who have equal knowledge take a test designed to assess that knowledge and those two people have a better than chance probability of correctly answering the questions, then the person who shows more of the tendency to gamble or answer questions in spite of uncertainty will receive a higher score than the more cautious person.

Summary. The first point to be noted is that the existence of response sets as reliable individual differences among people has been severely questioned (e.g. Rorer, 1965). Though some people may exhibit any of the tendencies to respond in the manner of response sets, the idea that these are reliable personality traits which go beyond the test-taking situation is probably too strong a claim. Nonetheless, any personality inventory should be constructed so as to eliminate the possibility that responses will be based on the structure of the inventory rather than item content.

The second point is that there are many elements in personality assessment which can result in misleading or invalid conclusions. When the assessment method is broadened to include both self-reports and other-reports, then the issues involving validity and measurement error become even more important, as the number of sources for these types of error is increased.

However, the literature does reveal that others can be an important source of information about the self and that others' observations can be as valid as standardized self-report instruments which purport to measure personality constructs when using direct self-ratings as the criterion (e.g. Kaufman & Murphy, 1981).

Summary

Many theories have been developed which bear directly on the question of whether other people perceive a person in the same way that person sees him/herself. The symbolic interactionism position (Mead) holds that other people's perceptions form the basis of self-perception, and there should be "perfect" agreement. Objective self-awareness (Duval & Wicklund) and self-perception (Bem) theories argue that an individual has both advantages and disadvantages in self-evaluation but is in essentially the same position as any outside observer in observing his/her own behavioral characteristics. Social comparison (Festinger) theory asserts that people self-evaluate preferably against objective criteria and secondarily with other people. Attribution theory states that self and others pay attention to different determinants in arriving at an evaluation of the self. With the exception of symbolic interactionism, the tendency in these theoretical positions is to allow for differences in self

and others' views with varying underlying reasons accounting for those differences.

The empirical research on self-other agreement indicates that agreement varies along the line of the type of relationship between self and other. The amount of agreement appears to decrease in relationship in the following order: spouse, close friend, friend, parent, and peer; and differences in agreement can be analyzed in terms of the four theoretical differences that Bem delineates: Self vs. Other, Intimate vs. Stranger, Insider vs. Outsider, and Actor vs. Observer.

Assessing self-other agreement through self- and other-report personality instruments requires attention to be paid to the validity, reliability, and sources of measurement error in the instrument. Studies have indicated other-ratings to be a valid form of assessment, and the research was reviewed which was relevant to the issue of reliability in other raters.

CHAPTER III

STATEMENT OF THE PROBLEM

The great majority of research on self-other agreement has considered relatively narrow aspects of the problem in three areas crucial to a complete understanding of the concept: nature of the self-other relationship, methods of analysis, and the personality constructs being assessed. Failure to recognize the implicit limitations of a study in any of these areas can lead to improperly generalized conclusions regarding self-other agreement.

The nature of the relationship is an important variable in self-other agreement (Funder, 1980), but most studies employ only one kind of relationship; e.g. friends (Scott & Johnson, 1972) or parent-child (Mote, 1966). These types of studies can provide data about hypotheses related to whether or not self-other agreement exists in one particular type of relationship but not about hypotheses relating to relative amounts of self-other agreement between types of relationships.

Of those studies which provided some kind of inferential statistical analysis, the existence of self-other agreement was determined either by significant self-other score correlations (e.g. Gray & Gaier, 1974; Hase & Goldberg, 1967) or by significant self-other mean score differences (e.g. Goslin, 1962;

Lomont, 1966). Funder (1980) recognized that these two analyses yield statistically independent types of information (Cronbach, 1955) and examined both types of information in a study of self-other agreement on 100 items relating to a wide variety of personality traits. His empirical results supported the notion of independence between correlated scores and mean differences by analyzing the correlation between self-other mean differences and self-other correlations ($r = -.01$, n.s.) and the relationship between the significance of an item's self-other correlation and its tendency to show a significant self-other difference ($\chi^2 = 1.21$, n.s.). However, although Funder did recognize and analyze these two important kinds of agreement, he did not examine the third important component of disperson. [Although Nunnally (1978) discusses disperson as it relates to profile scores of individuals, the concept applies equally well in the present context.] Disperson relates to the variable's tendency to fluctuate about the mean and is typically measured by the standard deviation of the variable. Thus, differences in self-other agreement can exist but go undetected if measured only by the correlation and mean difference of the self- and other-ratings. An outline of the appropriate statistic to use in assessing these three aspects of self-other agreement will be found in Chapter IV.

Most studies used as the dependent variables self- and other-ratings of a great variety of personality traits. However,

both theoretical (Jones & Nisbett, 1972) and empirical (Funder, 1980; Kenrick & Stringfield, 1980) considerations argue for the assertion that the type of personality trait plays a role in the amount of self-other agreement. Thus, results may be misleading if the effect of the trait itself on self-other agreement is ignored. The traits to be employed in the present research will be examined in Chapter IV.

The empirical literature varies considerably in its reported findings on self-other agreement, a fact probably due in large part to the different methods of analysis, different "selves" and "others" used as subjects, and different aspects of the personality examined. Although it is possible to look at self-other agreement across all types of relationships and this information is of interest, the more productive approach appears to be to examine how self-other agreement manifests itself in specific combinations of analyses, relationships, and aspects of the personality.

Hypothesis 1. Differences between self-perception and other-perceptions of the three Bi/Polar personality traits (thinking-risking, practical-theoretical thinking, and dependent-independent risking) as they are manifested by the self decrease with increase in the closeness of the relationship.

Rationale. Two of the four reasons noted by Bem (1972) for differences in self-other perceptions of the self directly relate to the closeness of the relationship. The "Intimate vs. Stranger difference" is alleviated to the extent that the "other" becomes more intimate with self due to interpersonal communication and sharing. Jones and Nisbett (1972) also refer to the historical data about the self about which the self typically knows more than the other. The "Self vs. Other difference" decreases as loyalty and friendship can also push the "other" to defend the self. Empirically, research demonstrates that close friends (e.g. Blumberg, 1972; Gray & Gaier, 1974) consistently demonstrate self-other agreement while relationships which involve relatively little interpersonal sharing (e.g. Todoroski, 1972; Manis, 1955) show little self-other agreement.

Hypothesis 2. Differences between self-perception and other-perceptions of the three Bi/Polar personality traits (thinking-risking, practical-theoretical thinking, and dependent-independent risking) as they are manifested by the self decrease with increase in the length of the relationship.

Rationale. Bem (1972) notes that one important theoretical reason for a lack of self-other agreement is due to the "Intimate vs. Stranger difference" in which only the self is privy to historical information about the self. As a relationship

increases in length, more historical data will become available
to the Stranger. Kinch (1963) also theorizes that longevity in
the relationship will increase the amount of agreement between
the self and the other. Empirically, many researchers (e.g.
Manis, 1955; Carroll, 1952) have shown that relationships which
involved frequent contact over a period of time result in signi-
ficant self-other agreement, whereas those studies which involved
relationships of short duration (e.g. Rokeach, 1945; Fey, 1955)
found little agreement.

Hypothesis 3a. Other-perceptions will ascribe highly
outwardly observable traits (risking, dependent risking, and
practical thinking) as more characteristic of the self than will
self-perceptions.

Hypothesis 3b. Self-perceptions will ascribe highly
inwardly observable traits (thinking, independent risking, and
theoretical thinking) as more characteristic of the self than
will other-perceptions.

Rationale. Funder (1980) found that highly outwardly
observable traits were rated as more characteristic of the self
by others than by the self. This theoretical expectation is
based on attribution theory--"internal" traits (e.g. introspec-
tion) are much more salient to the actor than the observer while

"external" traits (e.g. interaction with others) are especially salient to an outside observer. Although Kenrick and Stringfield (1980) found that increases in correlation between self and other ratings were correlated with increases in trait observability, they did not examine self-other agreement in terms of mean differences.

Hypothesis 4a. People ascribe the more socially valued traits (risking, practical thinking, and independent risking) to themselves more than the less socially valued traits (thinking, theoretical thinking, and dependent risking).

Hypothesis 4b. People ascribe the more socially valued traits (risking, practical thinking, and independent risking) to others more than the less socially valued traits (thinking, theoretical thinking, and dependent risking).

Rationale. Edwards (1957) has demonstrated that people will tend to respond to personality inventories so that the more socially desirable traits will be ascribed to them (or the ratee). Johnson (1981) found that some people, in taking a self-presentation view of themselves while responding to a personality inventory, tend to make themselves look like they would like to be regarded rather than how they really perceive themselves. Since our culture holds action-oriented, down-to-earth, self-reliant people (e.g.

entrepreneurs) in high esteem, then these traits (risking, practical thinking, and independent risking) should be more socially valued and more often affirmed than the stable, concept-oriented, and social-oriented qualities found in the traits of thinking, theoretical thinking, and dependent risking.

CHAPTER IV

METHOD

Subjects

The subject pool for this research consists of all
persons who attended a Bi/Polar Seminar between January 1, 1980
and December 31, 1981 (see Instrumentation). Each person who
attended this seminar completed Form A (self-report form) of the
Bi/Polar Inventory of Strengths and had up to five other people
complete a Form B (other-report form) on him/her (see Appendix A
for a copy of each form). The total number of seminar participants
during this period was 5,123, and the total number of "other"
respondents was 22,462. This total sample of 27,585 represents
a diverse cross-section of people in general as different seminars
were geared toward different categories of people--business
people, psychological counselors, counselees, churchgoers, nurses,
students, and the general public. The average number of partici-
pants per seminar was approximately 15.

Because the sample was quite large and missing data
requires some kind of adjustment in the sample or in the techniques
of analysis, a total of 1,510 Forms A were eliminated from the
sample because either one or more item responses was missing or
there were no associated Forms B. A total of 8,955 Forms B were

eliminated because their item responses were not complete, or
their associated Form A was eliminated for reasons stated above.
Thus, the reduced sample contained 3,613 Forms A and 13,507
Forms B with a total reduced sample size of 17,120.

Instrumentation

Theoretical background. Thomas (1971, 1978) developed
the Bi/Polar theory of personality as a result of his consulting
experience as a management psychologist. The theory postulates
that personality is formed by the interaction of four forces--
environment, innate capacities, personal choice, and a pattern
of core strengths. "Environment" refers to all those influences
which are external to a person--other people, social values,
nutrition, etc. "Innate capacities" refers to the amount of a
particular talent or ability a person may possess, such as IQ,
personal energy, etc. The third force, "personal choice,"
reflects the existence of human free will in a nondeterministic
universe. The last force, "pattern of core strengths," refers
to the possible configurations of six basic core strengths in
relation to one another. All forces are theoretically equivalent
in their strength, but any one of the four forces may be the most
influential in shaping the personality of a particular individual.

The force which is directly relevant to the present
study is the "pattern of core strengths" or "pattern." The

theory hypothesizes that every individual possesses three pairs
of polar opposite strengths, and one strength in each pair is the
lead or dominant strength of that pair. Thus, each person has
three lead strengths, and the pattern is wholly determined by
the particular combination of lead strengths that a person pos-
sesses (see Appendix B for a description of the patterns).

The strengths in the first pair (the basic pair) are
called thinking and risking. Thinking is a stable, rational,
intuitive, nonaction-oriented strength which allows a person to
plan, reason, and generate ideas. Risking is a dynamic, moving,
action-oriented strength which allows a person to express thoughts
and feelings and to move in the world. Every person has both
strengths but is consistently inclined to favor one or the other
strength. Thus, the first major division among the eight patterns
is along the thinking-risking polarity--four patterns (I, II,
III, and IV) have thinking as the lead strength, while four others
(V, VI, VII, and VIII) have risking as the lead strength.

The other two pairs of strengths exist as divisions of
the first strengths, thinking and risking. Thinking is composed
of two different types of thinking, practical and theoretical.
Practical thinking is logical, factual, and reality-oriented.
Use of this cognitive process involves a strict adherence to
seeing things as they are and what problems exist. Theoretical
thinking is intuitive, insightful, evaluative, and imaginative.

This mental process allows one to see how things might be and how a problem can be solved. Again, each individual has a natural lead strength in either practical or theoretical thinking--four patterns lead with practical thinking (I, II, V, and VII), while the other four (III, IV, VI, and VIII) lead with theoretical thinking.

The last pair of strengths comes from the basic strength of risking. <u>Dependent risking</u> is the ability to reach out to or become involved with another person, to trust, to be cooperative, and to listen to others. <u>Independent risking</u> is the ability to be self-reliant and competitive, to stand up for one's own rights, to be self-confident, and to demonstrate leadership. Every individual is hypothesized to have a lead strength in either dependent or independent risking; i.e., four patterns lead with dependent risking (I, III, V, and VI), while the other four lead with independent risking (II, IV, VII, and VIII).

Like the force of innate capacities, the pattern of strengths is theorized to be a <u>stable</u> force--its existence is genetically determined and does not change during a person's lifetime (insofar as its physical basis is not grossly altered). The implication of this assumption is that the lead strengths are a constant and dependable part of the personality and provide at least part of the basis for the existence of stable, consistent traits. Although the environment and personal choice (the <u>dynamic</u>

forces) can influence the expression of the lead strengths (the personality can change within the constraints of the stable forces), they are powerless to alter the fundamental stable structure of the personality (the pattern of strengths or innate capacities).

Instruments. The Bi/Polar theory of personality has been used in a variety of settings--management consulting, management development seminars, pastoral counseling, marriage counseling, and continuing education classes. In addition to these kinds of groups, the theory has been communicated to many individuals through two programs known as the Bi/Polar Seminar [Thomas, 1977(b)] and the Bi/Polar Team Building Program (Thomas, 1979). The former is designed to give insight to participants into their own personality and relationships while the latter concentrates on developing strong, positive relationships among people who work together closely through increased interpersonal communication and a respect for and understanding of the personality of each team member. In all of these settings it is essential that a participant be able to identify his/her own lead strengths and resultant pattern of strengths. To this end the Bi/Polar Inventory of Strengths [Thomas, 1977(a)] has been designed and developed to identify the lead strength in each of the bipolar pairs of strengths.

Page 78 has been omitted from this publication.

trait is totally dependent on the other--the two always sum to 120. For example, if a person were to score 70 for risking, then 50 would be his/her score for thinking. Thus, the inventory results for a rater can be analyzed in terms of three scale scores only. For the present research, the data have been arranged so that high scale scores will indicate risking, theoretical thinking, and independent risking as lead strengths, and low scale scores indicate thinking, practical thinking, and dependent risking as lead strengths. During the development of the Inventory, Mayo and Thomas (1978) used 1,001 subjects and reported item/scale correlations as shown in Tables 1 and 2. The results demonstrate the independence of the scales for this sample.

Mayo and Thomas also reported three studies of the construct validity of the Inventory. The first two involved comparing the lead strengths as identified by the Inventory on a particular individual with the lead strengths identified by a "blind" psychologist after one personal interview with the individual. In the first study of 41 individuals, psychologists' judgments matched the Inventory results on all three scales 16 times, on two scales 20 times, and on one scale 5 times. There were no instances in which there were no matches between the psychologists' judgments and inventory results (χ^2 = 36.79, p < .001). In the second study of 22 middle managers, the psychologists' judgments agreed with Inventory results on all three scales 12 times, on two scales 8 times, and on one scale 2 times. Again, there were no instances in which the inventory results and psychologists' judgments did not match at least once (χ^2 = 14.72, p < .001).

Table 1

Mean correlation coefficients between final scale items
and final scale totals (N = 1,001) of the
Bi/Polar Inventory

		Totals		
		T-R	P-T	D-I
Items	T-R	.68	.08	.04
	P-T	.06	.63	.01
	D-I	.04	.02	.60

Table 2

Bi/Polar final scale intercorrelations
for Form A (N = 1,001)

	T-R	P-T	D-I
T-R	–	.14	.06
P-T	.14	–	.01
D-I	.06	.01	–

The third study of construct validity involved the correlation of scale scores from the Inventory with scale scores of related or similar dimensions from the Vocational Preference Inventory (Holland, 1966), DF Opinion Survey (Guilford, 1956), and the Guilford-Zimmerman Temperament Survey (Guilford & Zimmerman, 1949). For example, the T-R scale (scored positively in the risking direction) correlates $r = .29$ ($p < .001$) with the Enterprising scale from the VPI, $r = .54$ ($p < .001$) with the General Activity scale and $r = -.29$ ($p < .01$) with the Thoughtfulness scale from the Guilford-Zimmerman Temperament Survey, and $r = .32$ ($p < .001$) with the Self-Reliance scale of the DF Opinion Survey. The P-T scale (scored positively for theoretical thinking) shows $r = -.29$ ($p < .01$) with the Realistic scale and $r = .25$ ($p < .05$) with the Artistic scale from the VPI, and $r = .38$ ($p < .01$) with the Aesthetic Appreciation scale from the DF Opinion Survey. Finally, the D-I scale (scored positively for independence) correlates $r = .31$ ($p < .01$) with the Self-Reliance scale and $r = -.22$ ($p < .05$) with the Cultural Conformity scale from the DF Opinion Survey.

Ramseur (1978) studied the relationship of Form A Inventory results on a sample of 64 Bi/Polar Seminar graduates with their subsequently obtained results on the FIRO-B questionnaire (Schutz, 1966). Results indicated significant correlations at $p < .01$ between the T-R scale and D-I scale and the FIRO

constructs of inclusion (degree of movement toward others), control (degree of dominance in relationship), and affection (degree of emotional involvement) but no significant relationships with the P-T scale. Since FIRO-B is a measure of interpersonal relations, it would be expected to relate to the T-R and D-I scales rather than the P-T scale.

Mayo and Thomas also reported reliability data pertaining to both Form A and Form B of the Inventory. Calculation of test/retest reliabilities for Form A on 63 seminar graduates (first administration was before they attended the Bi/Polar Seminar) with a period of from three to eight months between administrations yielded the following results: T-R, .907; P-T, .828; and D-I, .828. Using the self and six others as a group of seven raters, they found that the number of raters in agreement on the scales was significantly different than those expected by chance: T-R, χ^2 = 441.82, p < .001; P-T, χ^2 = 283.43, p < .001; and D-I, χ^2 = 209.53, p < .001. They also reported the range of average intercorrelations among six "other" raters and the average intercorrelations of each "other" with the "self" for each scale to be from .24 to .48 (all p < .01).

Operational Definitions

Self-perception is defined as the three scale scores (T-R, P-T, and D-I) on Form A of the Bi/Polar Inventory of Strengths.

Other-perception is defined as the three scale scores on Form B of the Bi/Polar Inventory of Strengths.

The thinking-risking trait perception is defined as the thinking-risking (T-R) scale score from either Form A or B of the Bi/Polar Inventory of Strengths.

The practical-theoretical thinking trait perception is defined as the practical-theoretical thinking (P-T) scale score from either Form A or B of the Bi/Polar Inventory of Strengths.

The dependent-independent risking trait perception is defined as the dependent-independent risking (D-I) scale score from either Form A or B of the Bi/Polar Inventory of Strengths.

Procedure

Computer data containing the results of Forms A and all Forms B for the initial subject pool were obtained from Bi/Polar, Inc. and transferred to the computer system at the University of Texas at Austin for analysis. Each primary subject (Form A) was coded on the computer tape for identification as a "self" as well as by sex and age. No names or other forms of identification were used. Each secondary subject (Form B) was coded on the computer tape for type of relationship with primary subject (spouse, relative, friend, co-worker, or other) and length of relationship ($<$ 1, 1-3, 4-6, 7-10, or $>$ 11 years) as well as sex and age. The ordering of subjects on the computer tape

(self followed by all associated others) provided easy identification of all 3,613 "cases." Thus, the complete anonymity of all subjects as well as their Inventory results were preserved.

Although other relationships (relative, other) were indicated on the Form B information, these could not be justified as being scaled with the other relationships along the closeness dimension. In addition, the length of relationship categories "4-6, 7-10, and > 11" were collapsed into a single " > 3" category because the difference in the amount of personality information which would be communicated between 3-11 years would not appear to be different from that which would be communicated over 11 years.

Data Analysis

The sample size in this study requires that particular attention be paid to the practical significance of differences between descriptive statistics used to test the research hypotheses rather than the statistical significance of those differences. For example, in Hypotheses 1 and 2, the large sample sizes resulted in very small standard errors of the mean, and any statistical significance of the mean differences in these cases is probably much more reflective of the precision of the sample mean estimates than of any meaningful difference between the population means. Therefore, for each of the research

hypotheses, a decision rule was formulated to determine significant practical differences between statistics appropriate to each hypothesis. The actual decision rules and the logic underlying each of them are stated below in the presentation of the results for each hypothesis.

Factor analysis of Bi/Polar Inventory of Strengths. A factor analysis of the combined Forms A and B of the Bi/Polar Inventory of Strengths was performed in order to examine its scale structure. Since the Inventory was designed to assess three orthogonal dimensions of personality, the number of factors and the correlations among the emergent factors were of particular interest. All analyses were done with SPSS or the Statistical Package for the Social Sciences (Nie et al., 1975) on the CDC Dual Cyber 70 at the University of Texas at Austin.

The original 45-by-45 correlation matrix (see Appendix C) used in the following factor analyses was constructed from a sample of N = 3,440 randomly chosen from the reduced sample of 17,120. Since this sample size provides for a ratio of 76.4 cases/variable, expectations were that the sample correlation matrix would closely approximate the population correlation matrix.

The type of analysis performed was principal axis, and the computational technique employed was that used by the PA2 procedure available in SPSS. This method replaces the diagonal

of the original unreduced correlation matrix (hereinafter referred to as R) with initial communality estimates as given by the squared multiple correlation (SMC) of each variable with the remaining 44 variables. Then an iteration process is used to improve the initial estimates of the communalities as follows: (a) initially determine the number of factors to be extracted from R (the default criterion is the Kaiser-Guttman eigenvalue-greater-than-one rule), (b) replace the diagonal with SMC's, (c) extract the same number of factors as determined initially, (d) produce new estimates of communalities based on the first solution, (e) replace the diagonal elements with these new estimates, and (f) continue until the difference between the communality estimates for two successive extractions is less than 0.001 or until 25 iterations have been performed, whichever criterion is reached first.

Each factor extracted by this method accounts for the maximum possible variance remaining in the correlation matrix after the variance accounted for by all previously extracted factors has been removed. Thus, factor 1 accounts for the maximum possible variance in the original reduced correlation matrix, factor 2 accounts for the maximum possible variance in the first residual correlation matrix, etc. In addition, factors are extracted so that they are all mutually orthogonal.

As a first estimate of the number of significant factors present, the n factors with eigenvalues greater than or equal to

one were retained (Guttman, 1954; Kaiser, 1958, 1970). The
resulting 45-by-n factor matrix was rotated according to the
varimax criterion (Kaiser, 1958) in order to simplify the factors
(the columns of the factor matrix) or approximate simple struc-
ture (Fruchter, 1967). Since the Kaiser-Guttman criterion for
determining the number of factors consistently overestimates the
true number of factors present in factor analyses of personality
test items (Revelle & Rocklin, 1979) and in large matrices
(Veldman, 1974), n will be considered an upper bound for the
true number of factors.

As a second estimate of the true number of factors, the
rotated factor matrix with n factors was examined for extraneous
or residual factors. Cattell [1966(b)] defines insignificant
factors as those with a platykurtic distribution of loadings.
In this study, insignificant factors were defined as those k
factors on which two or less variables have loadings whose
absolute values are greater than .30. Thus, the second estimate
of the true number of factors present was $n - k$.

As a third estimate of the true number of factors, the
scree test [Cattell, 1966(b); Cattell & Vogelmann, 1977] was
applied to the eigenvalue data in the principal components
solution. According to the scree criterion, the true number of
factors lies at the point in the number-of-factors-by-size-of-
eigenvalue graph where the curve "elbows" and levels out at

higher numbers of factors. Veldman (1974) has characterized this test as an examination of cumulative percentages of variance accounted for, and the point is well taken. Since the existence of an inflection point or points (and thus scree lines) on the curve is to a large extent dependent upon the scales of the graph, then examination of the successive differences in cumulative percentages of variance accounted for should more consistently reveal the true "elbows" in the curve; i.e. the true number of factors $\underline{m}$ is such that the percentage of variance accounted for by all factors greater than $\underline{m}$ is small compared to all factors less than or equal to $\underline{m}$ and also relatively constant (decreasing slightly as the number of factors increases).

The fourth estimate of the number of factors was that number of factors $\underline{i}_{max}$ which maximized the Very Simple Structure or VSS index of goodness of fit for factor solutions of complexity one (Revelle & Rocklin, 1979). The essence of this criterion is to choose that factor solution in which the rotated factor matrix best approximates simple structure. The mathematical basis of this criterion is as follows: replace all but the highest factor loading in each row of the rotated factor matrix F_i (where $\underline{i}$ is the number of factors retained) with zeroes to produce S_i (a degraded form of F_i). Then find

$$R_i^* = S_i S_i'$$ (1)

where $R_i^* \rightarrow R$ as $S_i \rightarrow F_i$. The residual matrix $\overline{R}_i$ is found by

$$\overline{R}_i = R - R_i^* \qquad (2)$$

and the final VSS_i criterion is found by

$$VSS_i = 1 - \left(MS_{r_i} / MS_r \right) \qquad (3)$$

where $MS_{\overline{r}_i}$ is the mean square of the lower off-diagonal elements

in R_i^* and MS_r is the mean square of the lower off-diagonal elements

in R. Thus, as $R_i^* \rightarrow R$, $VSS_i \rightarrow 1$. The value of $\underline{i}$ for which VSS_i

reaches a maximum for $\underline{i} = 1,2,\ldots\underline{j}$ ($\underline{j}$ = number of variables) or

$\underline{i}_{max}$ is the best estimate of the true number of factors. Actually,

because the distribution of VSS is unimodal, it is necessary to

compute values for VSS only until $VSS_{i-1} < VSS_i > VSS_{i+1}$. (A

Fortran program designed to calculate VSS for the present data has

been written by the author and can be found in Appendix D. The

program can be easily modified to accommodate correlation matrices

of different sizes as well as factor solutions of complexity

greater than one.)

Revelle and Rocklin tested the VSS criterion against

four other criteria (Kaiser-Guttman, Montanelli and Humphreys, and

two forms of maximum likelihood) on 32 24-item tests with item

communalities of .30 and population factor loadings indicating

simple structure of complexity one--two replications were made of

each combination of 1-, 2-, 3-, and 4- factor structures (with an

equal number of items per factor) with sample sizes of 50, 100,
200, and 400. According to the authors, these data were chosen
because they typify the data most often found when factoring
personality inventories--the communalities are low, and a simple
structure model is thought to be appropriate. The results showed
that the VSS criterion indicated the correct number of factors
30 out of 32 times (it underestimated by one factor in a 3-factor
solution with sample size 50 and underestimated by two factors in
a 4-factor solution with sample size 50). One of the maximum
likelihood criteria indicated the correct number 25 times while
the other three methods were vastly inferior (Kaiser-Guttman -
1 correct; Montanelli and Humphreys - 8 correct; other maximum
likelihood - 1 correct).

Because these authors have demonstrated that the VSS
criterion is accurate in and of itself and superior to other
methods in determining the true number of factors for the type of
data being analyzed in the present research, greater emphasis was
placed upon the value of i_{max} in arriving at a conclusion about
the true number of factors than any of the other empirical
estimations.

The final (and most important) step in arriving at a
conclusion about the true number of factors was psychological
interpretation (Nunnally, 1978). Since the rotation of "extra"
factors can destroy the latent structure of the major factors in

principal axis analyses (Kaiser, 1958), the varimax rotated factor matrices retaining 1 to $\underline{n}$ - $\underline{k}$ factors were examined for interpretability with special attention being paid to the solutions retaining $\underline{i}_{max}$ and $\underline{n}$ - $\underline{k}$ factors. Particular attention was paid to the 3-factor solution as this was the theoretically expected solution.

The initial factor matrices associated with those varimax rotated factor matrices chosen as best representing the latent factor structures of the Inventory were rotated obliquely in order to determine the amount of correlation among the factors. Since the theory behind the Inventory states that the three underlying dimensions represent three independent areas of the personality, the intercorrelations of the rotated factors, with the requirement of orthogonality removed, provided an empirical test of the independence assertion.

Reliability of the Bi/Polar Inventory of Strengths. The overall reliability of the Inventory (Forms A and B combined) was estimated by calculating coefficient alpha for the reduced sample (N = 17,120) as produced by the SPSS RELIABILITY procedure. Then, the reliability of each scale (T-R, P-T, and D-I) was estimated by calculating coefficient alpha for the same sample. In addition, item-total scale score correlations were calculated for each item within each of the three scales. Next, the reliabilities of the

individual Forms A (N = 3,613) and B (N = 13,507) and their

respective scales were also estimated by calculating alpha

coefficients.

Formation of new scales. The results of the factor

analysis study provided an empirical guideline for redefining

the scales. Items for which the highest loading in the final

rotated factor matrix did not exceed .32 were removed. This

criterion ensured that the item had a communality of at least

.10 and a variance substantially explained by that factor. Since

each item was theoretically associated with only one scale, each

item should also have loaded primarily on only one factor. There-

fore, each item also had to meet the arbitrary criterion of there

being a difference of at least .15 between the primary and secon-

dary factor loadings.

In addition to the factor analytic criterion, the item-

total scale score correlations for each item were examined for

all remaining items. Any item for which the item-total scale

score correlation was less than .30 was removed.

Hypotheses 1 and 2. Osgood and Suci (1952), Cronbach

and Gleser (1953), and Osgood, Suci, & Tannenbaum (1957) have

developed a measure which considers all three aspects of profile

similarity (Nunnally, 1978)--level, shape, and dispersion. This

measure, called D, is simply the distance between two points in

Euclidean space (using the generalized Pythagorean theorem for a k-variable space). Thus, for the distance between two persons a and b on k orthogonal variables,

$$D = \left[\sum_{j=1}^{k} (X_{aj} - X_{bj})^2 \right]^{1/2} \qquad (4)$$

D could more appropriately be called a measure of dissimilarity because the larger D is (the greater the distance between the two points), the more dissimilar the two profiles are.

A more generalized distance measure which preceded the development of D and of which D is a special case is the Mahalanobis distance measure D_1^2 (Rao, 1948). The Mahalanobis distance is given by:

$$D_1^2 = \sum \sum \alpha^{jj'} \Delta x_j \Delta x_{j'} \qquad (5)$$

where $\alpha^{jj'}$ is the jj' element of the inverse of the covariance matrix between variables within groups. Since D_1^2 is a measure of dissimilarity in which the orthogonal components of the original set of variables are assigned equal weight, the same results could be obtained by factoring the correlation matrix of the original variables into n orthogonal factors, computing the person's scores on those factors, and then applying the D measure (Cronbach & Gleser, 1953). Thus, if the Bi/Polar Inventory of Strengths were composed of three orthogonal factors, then D could

be applied to two people's T-R, D-I, and P-T scale scores to provide a measure of similarity consonant with the logic underlying D_1^2.

In the present research, the "persons" in the profile were any of the members of the subject pool, and the "k variables" were the three Bi/Polar scales (T-R, P-T, and D-I). For example, two profiles (a "self" and a "spouse") could be graphically illustrated as in Figure 1. Thus, for Hypotheses 1 and 2, D was used as the basic measure of agreement between the "self" and the variously defined categories of "others."

Calculation of D. Three measures of profile similarity (one for each type of relationship) were required to test Hypothesis 1, and from 1 to 5 measures of D were obtained for each primary subject i--the distances between "selves" and spouses $(D_{Sp,i})$, "selves" and friends $(D_{F,i})$, and "selves" and co-workers $(D_{C,i})$. These measures were calculated for each subject i from the raw score data matrix in Table 3 (matrix contains l - 1 columns, where l = number of others who rated subject i). The $D_{j,i}$ were calculated as follows for each subject i:

$$D_{Sp,i} = \sqrt{(B_{S,i} - B_{Sp,i})^2 + (T_{S,i} - T_{Sp,i})^2 + (R_{S,i} - R_{Sp,i})^2} \quad (6)$$
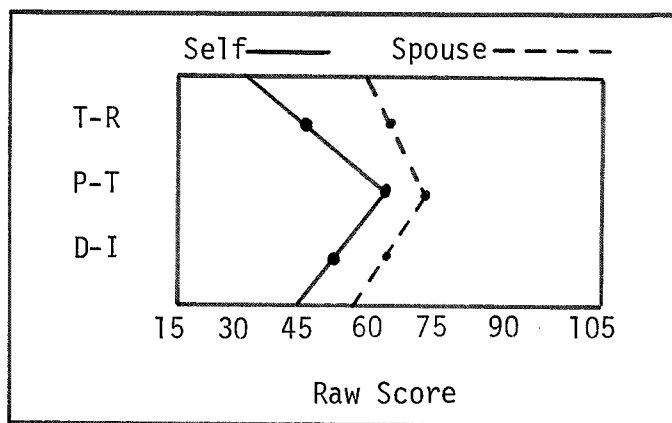
Figure 1. Profiles of self and spouse in
terms of three scale scores

Table 3

Raw scale score data matrix for subject $\underline{i}$
for the type of relationship

		Self	Spouse	Friend	Co-worker
(B)	T-R	B_{Si}	B_{Spi}	B_{Fi}	B_{Ci}
(T)	P-T	T_{Si}	T_{Spi}	T_{Fi}	T_{Ci}
(R)	D-I	R_{Si}	R_{Spi}	R_{Fi}	R_{Ci}

B_{Si} = Form A score on T-R scale for subject i (self)

T_{Si} = " " " " P-T " " " " "

R_{Si} = " " " " D-I " " " " "

B_{Spi}= Form B " " T-R " " " " (spouse)

T_{Spi}= " " " " P-T " " " " "

R_{Spi}= " " " " D-I " " " " "

B_{Fi} = " " " " T-R " " " " (friend)

T_{Fi} = " " " " P-T " " " " "

R_{Fi} = " " " " D-I " " " " "

B_{Ci} = " " " " T-R " " " " (co-worker)

T_{Ci} = " " " " P-T " " " " "

R_{Ci} = " " " " D-I " " " " "

$$D_{F,i} = \sqrt{(B_{S,i} - B_{F,i})^2 + (T_{S,i} - T_{F,i})^2 + (R_{S,i} - R_{F,i})^2} \quad (7)$$

$$D_{C,i} = \sqrt{(B_{S,i} - B_{C,i})^2 + (T_{S,i} - T_{C,i})^2 + (R_{S,i} - R_{C,i})^2} \quad (8)$$

The resulting data matrix took the form shown in Table 4 where M = total number of spouses who completed Form B, N = total number of friends who completed Form B, and P = total number of co-workers who completed Form B.

Three measures of profile similarity were required to test Hypothesis 2, and from 1 to 5 measures of D were obtained for each primary subject $\underline{i}$: the distances between self and others who have known the self less than 1 year (D_{1i}), the self and others who have known the self for 1-3 years (D_{2i}), and the self and others who have known the self for more than 3 years (D_{3i}). These three measures were calculated for each subject $\underline{i}$ from the raw score data matrix in Table 5 (matrix contaims $\underline{m}$ - 1 column, where $\underline{m}$ = number of others who rated subject $\underline{i}$). Then, the $D_{j,i}$ were calculated as follows for each subject $\underline{i}$:

$$D_{1i} = \sqrt{(B_{Si} - B_{1i})^2 + (T_{Si} - T_{1i})^2 + (R_{Si} - R_{1i})^2} \quad (9)$$

$$D_{2i} = \sqrt{(B_{Si} - B_{2i})^2 + (T_{Si} - T_{2i})^2 + (R_{Si} - R_{2i})^2} \quad (10)$$

Table 4

D score matrix for the type of relationship

Sp (Spouse)	F (Friend)	C (Co-worker)
$D_{Sp,1}$	$D_{F,1}$	$D_{C,1}$
$D_{Sp,2}$	$D_{F,2}$	$D_{C,2}$
.	.	.
.	.	.
.	.	.
$D_{Sp,i}$	$D_{F,i}$	$D_{C,i}$
.	.	.
.	.	.
.	.	.
$D_{Sp,M}$	$D_{F,N}$	$D_{C,P}$

Table 5

Raw scale score data matrix for subject $\underline{i}$
for the length of the relationship

	Self	Other (<1)	Other (1-3)	Other (>3)
(B) T-R	B_{Si}	B_{1i}	B_{2i}	B_{3i}
(T) P-T	T_{Si}	T_{1i}	T_{2i}	T_{3i}
(R) D-I	R_{Si}	R_{1i}	R_{2i}	R_{3i}

B_{Si} = Form A score on T-R scale for subject i

T_{Si} = " " " " P-T "   "   "   "

R_{Si} = " " " " D-I "   "   "   ".

B_{1i} = Form B score on T-R scale for subject i (< 1)

T_{1i} = " " " " P-T "   "   "   "   "

R_{1i} = " " " " D-I "   "   "   "   "

B_{2i} = " " " " T-R "   "   "   " (1-3)

T_{2i} = " " " " P-T "   "   "   "   "

R_{2i} = " " " " D-I "   "   "   "   "

B_{3i} = " " " " T-R "   "   "   " (> 3)

T_{3i} = " " " " P-T "   "   "   "   "

R_{3i} = " " " " D-I "   "   "   "   "

$$D_{3i} = \sqrt{(B_{Si} - B_{3i})^2 + (T_{Si} - T_{3i})^2 + (R_{Si} - R_{3i})^2} \quad (11)$$

The resulting data matrix took the form shown in Table 6 where

MM = total number of Form B raters in relationship less than 1

year, NN = total number of Form B raters in relationship from

1-3 years, and PP = total number of Form B raters in relation-

ship more than 3 yeras.

Null and alternate hypotheses. Support for Hypothesis 1

would result from demonstrating that $D_{Sp,1} < D_{F,.}$ and that

$D_{F,.} < D_{C,.}$. Thus, the null hypothesis for testing the first

inequality was:

$$H_{0_{11}} : \mathcal{M}_{D_{Sp}} \geq \mathcal{M}_{D_F} \quad \text{(The population mean of the } D_{Sp}$$

scores is greater than or equal to the population mean of the

D_F scores.) Rejection of this null hypothesis would allow

acceptance of the alternate hypothesis:

$$H_{A_{11}} : \mathcal{M}_{D_{Sp}} < \mathcal{M}_{D_F} \quad \text{(The population mean of the } D_{Sp}$$

scores is less than the popolation mean of the D_F scores.)

For the second inequality, the null hypothesis tested

was:

$$H_{0_{12}} : \mathcal{M}_{D_F} \geq \mathcal{M}_{D_C} \quad \text{(The population mean of the } D_F \text{ scores}$$

is greater than or equal to the population mean of the D_C scores.)

Table 6

D score matrix for length of relationship

1 (< 1 year)	2 (1-3 years)	3 (> 3 years)
D_{11}	D_{21}	D_{31}
D_{12}	D_{22}	D_{32}
$\vdots$	$\vdots$	$\vdots$
D_{1i}	D_{2i}	D_{3i}
$\vdots$	$\vdots$	$\vdots$
D_{1MM}	D_{2NN}	D_{3PP}

Rejection of this null hypothesis would allow acceptance of the alternate hypothesis:

$$H_{A_{12}} : \mathcal{M}_{D_F} < \mathcal{M}_{D_C}$$ (The population mean of the D_F scores

is less than the population mean of the D_C scores.)

The acceptance of both alternate hypotheses would lend support to research Hypothesis 1, while the acceptance of only one would lend partial support.

Support for Hypothesis 2 would result from demonstrating that $D_{3,.} < D_{2,.}$ and that $D_{2,.} < D_{1,.}$. For the first inequality, the null hypothesis tested was:

$$H_{O_{21}} : \mathcal{M}_{D_3} \geq \mathcal{M}_{D_2}$$ (The population mean of the D_3 scores

is greater than or equal to the population mean of the D_2 scores.) Rejection of this null hypothesis would allow acceptance of the alternate hypothesis:

$$H_{A_{21}} : \mathcal{M}_{D_3} < \mathcal{M}_{D_2}$$ (The population mean of the D_3 scores

is less than the population mean of the D_2 scores.)

For the second inequality, the null hypothesis tested was:

$$H_{O_{22}} : \mathcal{M}_{D_2} \geq \mathcal{M}_{D_1}$$ (The population mean of the D_2 scores

is greater than or equal to the population mean of the D_1 scores.) Rejection of this null hypothesis would allow acceptance of the alternate hypothesis:

$$H_{A_{22}}: \mu_{D_2} < \mu_{D_1}$$ (The population mean of the D_2 scores

is less than the population mean of the D_1 scores.)

The acceptance of both alternate hypotheses would lend support to research Hypothesis 2, while the acceptance of only one would lend partial support.

Descriptive statistics. Support for Hypothesis 1 would result from demonstrating that $D_{Sp,.} < D_{F,.}$ and that $D_{F,.} < D_{C,.}$. Since the sample size for each of these D measures was so large (M = 1,781, N = 4,460, and P = 4,523) and the population means were so precisely estimated by the sample means, descriptive statistics of each D's distribution (D_{Sp}, D_F, and D_C) were examined to ascertain what "practical" differences, if any, existed between the D's. The decision rule used to establish practical significance is stated below. Those statistics which were calculated and analyzed included the following: 1) the number of cases, 2) the mean, 3) the standard error of the mean, 4) the standard deviation, 5) the theoretical lower and upper bounds, 6) the minimum and maximum values, 7) the kurtosis, and 8) the skewness (all values were produced by the SPSS CONDES-CRIPTIVE procedure).

Support for Hypothesis 2 would result from demonstrating that $D_{3,.} < D_{2,.}$ and that $D_{2,.} < D_{1,.}$. Since the sample size for

each of these D measures was also quite large (MM = 1,210, NN = 3,779, and PP = 8,518), the same descriptive statistics mentioned above were also calculated for the distribution of D_1, D_2, and D_3 in order to ascertain "practically" significant differences between the population parameters of those distributions. The decision rule for Hypothesis 2 follows immediately.

For all of these tests of inequalities in Hypotheses 1 and 2, a uniform decision rule was established to differentiate significant from negligible practical differences. Since a 7-point scale is precise to only 7 intervals, the lower bound of a measurable difference between two items is an average of one interval for each item in each Inventory scale. If more than half of the items in each scale demonstrated a difference of exactly one internal and the remaining items demonstrated no difference, then the larger group of items would be indicating a measurable difference in perceptions, while the smaller group would be demonstrating agreement. This condition will constitute the minimum criterion for a practically significant difference. Thus, if $\underline{x}$ is the constant mean item difference for D_i and $D_i < D_j$, then the constant mean item difference for D_j must be greater than $\underline{x}$ + .5 in order to establish a practically significant difference.

The D scores involved in both hypotheses were also converted to $\underline{z}$ scores, and the same statistics as above were calculated using the normalized scores.

Analysis of variance. A 3-by-3 unweighted means analysis of variance was used to test for differences between the sample means involved in Hypotheses 1 and 2. Although no specific hypotheses have been developed concerning the type-by-length interaction effect, this 2-way ANOVA provided information about that effect as well as the type and length main effects related to Hypotheses 1 and 2.

Since this data set resulted in widely varying cell sizes, a procedure suited to this situation was chosen. The unweighted means ANOVA procedure was based on the assumption that unequal cell sizes in the sample data existed for reasons unrelated to the proportions found between the total populations, and the procedure compensated for extremely unequal cell sizes. Thus, this procedure ensured that each cell mean contributed equally (regardless of cell size) to each effect of which it was a part. See Kirk (1968) for computational formulas.

The actual analysis of the data was performed using the PRIME statistical package (Veldman, 1972) with the AOV123. routine on the CDC system at the University of Texas at Austin.

Hypothesis 3. This research hypothesis was tested by examining the mean differences between the Form A responses and Form B responses for each of the three scales. For each subject i, there were two measurements on each scale--the score on

Form A and the average scores of the related Forms B. The null

hypotheses tested were the following:

$$H_{0_{31}} : \mu_{BS} \geq \mu_{BO}.$$ (The population mean of Form A

scores on the Basic (T-R) scale is greater than or equal to the

population mean of average Form B scores.)

$$H_{0_{32}} : \mu_{TS} \leq \mu_{TO}.$$ (The population mean of Form A

scores on the Thinking (P-T) scale is less than or equal to the

population mean of average Form B scores.)

$$H_{0_{33}} : \mu_{RS} \leq \mu_{RO}.$$ (The population mean of Form A

scores on the Risking (D-I) scale is less than or equal to the

population mean of average Form B scores.)

The alternate hypotheses for each of these null hypotheses

are the following:

$$H_{A_{31}} : \mu_{BS} < \mu_{BO}.$$

$$H_{A_{32}} : \mu_{TS} > \mu_{TO}.$$

$$H_{A_{33}} : \mu_{RS} > \mu_{RO}.$$

These alternate hypotheses state that Form A responses will describe

the inwardly observable traits of thinking, theoretical thinking,

and independent risking as more characteristic of the subject than

will Form B responses.

Descriptive statistics of the six distributions associated with this hypothesis (the number of cases, mean, standard error of the mean, standard deviation, theoretical lower and upper bounds, minimum and maximum values, kurtosis, and skewness) were calculated and examined for the purpose of determining whether or not practically significant differences existed between the appropriate population means. In addition, a t test for correlated means (p = .01, df = 3.612, one-tailed) as produced by the SPSS T-TEST routine was used to test each of the null hypotheses. Note that with such a large sample size, very significant statistical differences could exist even though there were negligible practical differences. The following decision rule provided the criterion to establish practically significant differences.

The logic underlying the decision rule for Hypothesis 3 is the same as that for Hypotheses 1 and 2. A practically significant difference must reflect the fact that, on the average, more than half the items are demonstrating the least measurable difference of one interval. Thus, the difference between the population scale means had to be greater than half the number of items in the scale.

Hypothesis 4. This hypothesis was tested by examining the difference between ratings on each of the three scales and

the indeterminate mean scale values of 50 for both Form A and Form B responses. The null hypotheses tested were:

$$H_{o_{41A}} : \mu_{BS} \geq 50 \quad \text{(The population mean of Form A T-R}$$

scale scores is less than or equal to 50.)

$$H_{o_{42A}} : \mu_{TS} \geq 50 \quad \text{(The population mean of Form A P-T}$$

scale scores is greater than or equal to 50.)

$$H_{o_{43A}} : \mu_{RS} \leq 50 \quad \text{(The population mean of Form A D-I}$$

scale scores is less than or equal to 50.)

$$H_{o_{41B}} : \mu_{BO} \leq 50 \quad \text{(The population mean of Form B T-R}$$

scale scores is less than or equal to 50.)

$$H_{o_{42B}} : \mu_{TO} \geq 50 \quad \text{(The population mean of Form B P-T}$$

scale scores is greater than or equal to 50.)

$$H_{o_{43B}} : \mu_{RO} \leq 50 \quad \text{(The population mean of Form B D-I}$$

scale scores is less than or equal to 50.)

The respective alternate hypotheses were:

$$H_{A_{41A}} : \mu_{BS} > 50$$

$$H_{A_{42A}} : \mu_{TS} < 50$$

$$H_{A_{43A}} : \mu_{RS} > 50$$

$$H_{A_{41B}} : \mu_{BO} > 50$$

$$H_{A_{42B}} : \mu_{TO} < 50$$

$$H_{A_{43B}} : \mu_{RO} > 50$$

Each of the null hypotheses was tested by establishing a confidence interval for the mean of each scale ($p < .01$, df = 3,612). However, since the sample size was so large, population scale-means determined to be statistically different from 50 were also analyzed in terms of descriptive statistics (the number of cases, mean, standard error of the mean, standard deviation, theoretical lower and upper bounds, minimum and maximum values, kurtosis, and skewness) in order to ascertain which statistically significant differences were also "practically" significant. The decision rule for practical significance used the same logic as that for the other three hypotheses. The difference between a mean scale score and the indeterminate value of 50 had to be greater than half the number of items on that scale, or, equivalently, the mean item score difference had to be greater than .5.

Since people from the management seminars may be more oriented toward the strengths being hypothesized to be favored than other subjects, the preceding analyses were also performed on a subpopulation of management seminar participants (N = 100). The data analysis was the same as that used for the whole sample (descriptive statistics and confidence intervals for the mean).

CHAPTER V

RESULTS

Factor Analysis of the Bi/Polar
Inventory of Strengths

The first step in the factor analysis procedure was to
extract those n factors in the principal components solution
whose eigenvalues were greater than or equal to one. Under this
criterion, n = 8 factors were retained as is indicated in Table 7.

Examination of the varimax rotated factor matrix for the
8-factor principal axis solution revealed that factors 5, 6, 7,
and 8 all demonstrated a platykurtic distribution of loadings.
Since k = 4 (the number of factors with a platykurtic distribu-
tion of loadings), then the second estimate of the true number of
factors becomes n - k = 8 - 4 = 4.

The third estimate of the true number of factors was
made by the scree test. Figure 2 (the scree plot) indicates that
the true number of factors m is three. The first scree line
begins at factor 4 and ends at factor 6 while the second scree
begins at factor 6 and ends at factor 45 (not shown). Since the
determination of a scree line is to a large extent a subjective
determination, absolute confidence cannot be placed in it. How-
ever, examination of Table 7 does indicate a sharp drop in per-
centage of total variance accounted for beginning with factor 4

Table 7

Eigenvalues and percentages of total variance
accounted for by first 20 factors in the
principal components solution

Factor	Eigenvalue	Percent of Variance Accounted For (Actual)	Percent of Variance Accounted For (Cumulative)
1	6.40	14.2	14.2
2	5.50	12.2	26.4
3	4.72	10.5	36.9
4	2.36	5.3	42.2
5	1.65	3.7	45.8
6	1.35	3.0	48.8
7	1.22	2.7	51.5
8	1.10	2.4	54.0
9	.98	2.2	56.2
10	.95	2.1	58.3
11	.92	2.0	60.3
12	.85	1.9	62.2
13	.83	1.9	64.1
14	.78	1.7	65.8
15	.73	1.6	67.4
16	.71	1.6	69.0
17	.69	1.5	70.5
18	.66	1.5	72.0
19	.64	1.4	73.4
20	.62	1.4	74.8
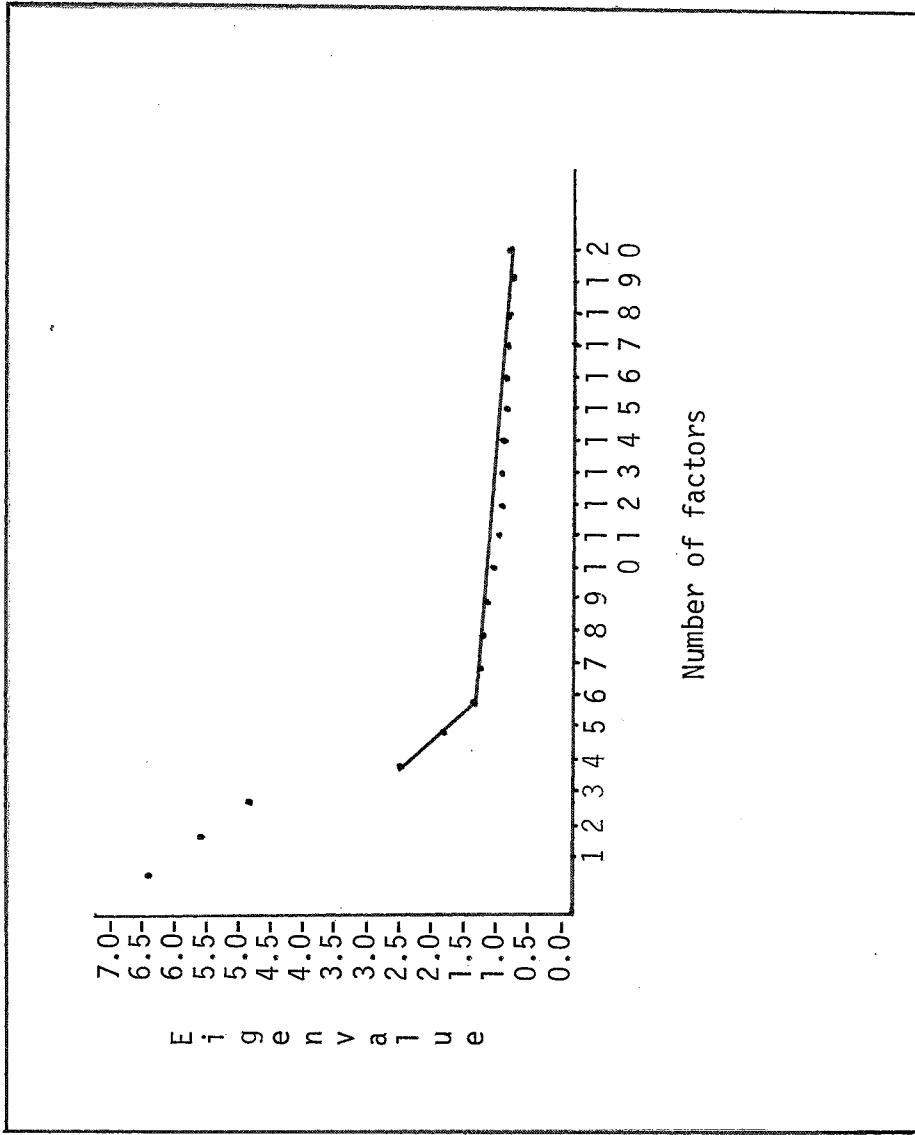
Figure 2. The scree plot

and a slow, steady decline after that. Thus, the percentage of variance accounted for criterion also indicates the presence of $\underline{m}$ = 3 factors.

The fourth and most empirical estimate of the number of factors was made by the VSS criterion, and the results very clearly indicate the presence of three factors (see Table 8). Thus, $\underline{i}_{max}$ = 3. The convergence of personality test data described by Revelle and Rocklin and the present data is important to note. The present data exhibited item communalities on the average slightly greater than .30, and the primary factor loading for most items ranged from .45 to .67. In addition, a simple structure model of complexity one appears to be appropriate for this data.

Four estimates of the true number of factors underlying the Bi/Polar Inventory of Strengths have been made with the use of empirical tests, and these results are summarized in Table 9. It should be remembered that the Kaiser-Guttman criterion ($\underline{n}$) should be considered an upper bound rather than a true estimate and that $\underline{n}$ - $\underline{k}$ did not involve an examination of the 3-factor solution. Thus, these results clearly support the assertion that three factors comprise the Inventory.

Since theoretical considerations also support the existence of three factors, the only remaining criterion to fulfill is that of psychological interpretation. Interpretability

Table 8

VSS criterion values for principal
axis factor solutions 1 - 5

Factors Retained (i)	VSS
1	.42
2	.64
3	.76
4	.66
5	.66

Table 9

Four estimates of true number of factors

Criterion	Number of Factors Indicated
Kaiser-Guttman ($\underline{n}$)	8
Examination of Extraneous Factors ($\underline{n}$ - $\underline{k}$)	4
Scree Test ($\underline{m}$)	3
VSS Criterion ($\underline{i}_{max}$)	3

can be conceptualized as the degrees to which (a) those items theoretically expected to load highly on the same factor actually do, and (b) the rotated factor matrix approximates simple structure. Table 10 shows the final varimax rotated factor matrix so that the first 15 items theoretically comprise the T-R scale, the second 15 theoretically comprise the P-T scale, and the last 15 theoretically comprise the D-I scale. The items themselves have been labeled 5 through 49 to correspond to scoring tables on the Inventory (see Appendix A) and have been arranged in descending order of size of primary factor loading.

Examination of Table 10 reveals that most of the items load on the intended factor; the highest primary loading for each item is sufficient in size and associated with the same factor as the other items conceptually related to it. In addition, the other two loadings for each item are much smaller than the primary loading and are close to zero. Table 11 shows the eigenvalues for the 3-factor solution as well as individual and cumulative percentages of common variance accounted for in the original items. Note that the percentages of variance accounted for refer to the common variance. The ratio of common to total variance was found to be 26.58/45 = .59.

The rotated factor matrix for the 4-factor solution reveals similar loadings as the 3-factor solution on the two factors representing the D-I and P-T scales. However, in the

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Table 11

Eigenvalue data for the 3-factor solution

Factor	Eigenvalue	Percentage of Common Variance Accounted For (individual)	Percentage of Common Variance Accounted For (cumulative)
1 (T-R)	5.80	21.8	21.8
2 (D-I)	4.85	18.3	40.1
3 (P-T)	4.07	15.3	55.4

4-factor varimax rotated factor matrix, the T-R scale is clearly represented by factors 2 and 4. Table 12 shows the factor loadings for the items comprising the T-R scale on factors 2 and 4 (loadings for all other items are near zero on these 2 factors). A preliminary interpretation of the two groupings of items indicates that the factor 2 items focus on the quality of general activity or impulsiveness while the factor 4 items all concern the propensity to make decisions. Both of these qualities are inherent in the thinking-risking construct.

The initial factor matrix from the 3-factor solution was rotated obliquely in order to assess the degree of correlation between the factors. When the rotation procedure was allowed to produce a highly correlated solution by setting $\delta = .5$ (Harman, 1967), the correlations between the factors in the 3-factor solution resulted as indicated in Table 13. For all practical purposes, these correlations will be considered negligibly different from zero, and further analysis will presume three orthogonal dimensions underlying the Inventory.

Reliability of the Bi/Polar
Inventory of Strengths

Coefficient alpha was calculated for the total sample (N = 17,120) on the 45-item Inventory as well as on each of the 15-item scales comprising the Inventory. In addition, coefficient

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Table 13

Factor pattern correlations in 3-factor principal
axis solution (oblique rotation, δ = .5)

	Factor 1 (T-R)	Factor 2 (D-I)	Factor 3 (P-T)
Factor 1 (T-R)	1.00	.02	-.04
Factor 2 (D-I)	.02	1.00	.04
Factor 3 (P-T)	-.04	.04	1.00

alpha was calculated on the same four groups of items for each
of Form A (N = 3,613) and Form B (N = 13,507). These results are
summarized in Table 14. The range of coefficient alpha was com-
parable to what has been found for other personality inventories.
A detailed comparison to the reliabilities of two specific inven-
tories (the GZTS and the 16PF) is presented in Chapter VI.

In addition to the computation of coefficient alpha, the
item-total scale score correlation for each item within each of
the three scales (T-R, D-I, and P-T) was calculated. This
statistic is important in individual item analysis and is an
indication of whether or not that particular item is properly a
part of that scale determination. These results are summarized
in Table 15. The following section discusses in detail the sig-
nificance of these correlations for each item.

Formation of New Scales

To a large extent, the results of the factor analysis
indicated that the structure of Inventory is what it was designed
to be--three independent scales. The varimax rotated factor
matrix for the 3-factor principal axis solution shows that most
items are empirically associated with those items with which
they are theoretically associated. However, for the purposes of
the data analysis required for empirically testing Hypotheses 1
through 4, some items were removed to create "purer" scales

Table 14

Values of coefficient alpha for all
combinations of form and scale

Form	Scale	Coefficient Alpha
Combined A & B (N = 17,120)	Total Inventory	.82
"	T-R	.89
"	D-I	.86
"	P-T	.80
A (N = 3,613)	Total Inventory	.83
"	T-R	.89
"	D-I	.85
"	P-T	.83
B (N = 13,507)	Total Inventory	.82
"	T-R	.88
"	D-I	.86
"	P-T	.78

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according to the factor analysis and reliability criteria des-
cribed below.

The T-R scale is the best constructed scale of the
three, and all items meet the criteria required for an item to be
retained as a part of that scale. Each item exhibits the fol-
lowing characteristics: 1) the primary factor loading is in
excess of .32 (the smallest is .47), 2) there exists a difference
between the primary and secondary loadings of at least .15 (the
smallest is .25), and 3) the primary loading for each item is on
the same factor (factor 1). In addition, each of the item-total
scale score correlations exceeds .30 (the smallest is .43).
Thus, the T-R scale scores in the further analyses will be based
on the original 15 items.

Items 12 and 43 are the only items comprising the D-I
scale which do not meet all the criteria for retention as a part
of the scale. The primary loading for item 43 does not exceed
the secondary loading by .15 (.37 - .25 = .12). Item 12 does
not meet any of the three criteria: 1) the primary loading is
less than .32 (.29), 2) the primary loading does not exceed the
secondary loading by .15 (.29 - .25 = .04), and 3) the item-
total scale score correlation is less than .30 (.29). Thus,
the D-I scale will be composed of all the original items except
for items 12 and 43--a total of 13 items.

Items 29, 48, 45, 27, and 19 from the P-T scale do not have primary loadings greater than .32 nor do their item-total scale correlations exceed .30. In fact, items 27 and 19 are the only two items on the whole Inventory not having primary loadings on the theoretically expected factor (they both load primarily and negatively on the T-R scale). In addition, the primary loadings for items 45, 27, and 19 do not exceed the secondary loadings by .15. Thus, all five of these items will be removed in constructing the new P-T scale. [Although the difference between the primary and secondary loadings for item 46 was slightly less than .15 (.14), this item was retained for the following reasons: 1) the difference almost met the .15 criterion, 2) the item easily met all other criteria, and 3) one-third of the items had already been removed from the scale.]

Hypotheses 1 and 2

Calculation of D. D scores were calculated for every Form B respondent (N = 13,507) by means of a Fortran program written by the author. These scores were also converted into z score form (N = 13,507) by use of the SPSS CONDESCRIPTIVE procedure with Option 3.

Descriptive statistics. The descriptive statistics associated with Hypothesis 1 and 2 are shown in Tables 16 and 17.

Table 16

Descriptive statistics about distributions of raw D scores
associated with Hypotheses 1 and 2

Distribution	Number of cases	Mean	Standard error of the mean	Standard Deviation
D_{Sp}	1,781	19.56	.23	9.59
D_F	4,460	21.30	.15	10.04
D_C	4,523	21.53	.15	10.12
D_3	8,518	20.82	.11	9.94
D_2	3,779	21.56	.17	10.20
D_1	1,210	21.82	.30	10.26

(continued)

Table 16 (continued)

| Distribution | Theoretical Bounds | | Extreme Values | | Kurtosis | Skewness |
	Lower	Upper	Min.	Max.		
D_{Sp}	0.00	133.36	1.00	67.83	1.50	.89
D_F	0.00	133.36	1.00	78.31	.70	.75
D_C	0.00	133.36	0.00	73.68	.92	.80
D_3	0.00	133.36	0.00	73.68	.70	.74
D_2	0.00	133.36	1.41	78.31	1.00	.85
D_1	0.00	133.36	1.00	74.99	.83	.70

Table 17

Descriptive statistics about distributions of normalized D scores
associated with Hypotheses 1 and 2

Distribution	Number of cases	Mean	Standard error of the mean	Standard Deviation
D_{Sp}	1,781	-.15	.02	.95
D_F	4,460	.02	.02	1.00
D_C	4,523	.04	.15	1.01
D_3	8,518	-.03	.01	.99
D_2	3,779	.04	.02	1.02
D_1	1,210	.07	.03	1.02

(continued)

Table 17 (continued)

| Distribution | Theoretical Bounds | | Extreme Values | | Kurtosis | Skewness |
	Lower	Upper	Min.	Max.		
D_{Sp}	-2.10	11.17	-2.00	4.65	1.50	.89
D_F	-2.10	11.17	-2.00	5.69	.70	.75
D_C	-2.10	11.17	-2.10	5.23	.92	.80
D_3	-2.10	11.17	-2.10	5.23	.70	.74
D_2	-2.10	11.17	-1.96	5.69	1.00	.85
D_1	-2.10	11.17	-2.00	5.36	.83	.70

Table 16 applies to the raw D scores, while Table 17 contains the same statistics as they apply to the normalized D scores.

The inequalities representing the relationship of the sample means are in the directions indicated by the alternate hypotheses in both Hypotheses 1 and 2. Thus, for Hypothesis 1, the sample means demonstrate the $D_{Sp,1} < D_{F,.}$ and that $D_{F,.} < D_{C,.}$. For Hypothesis 2, the results demonstrated that $D_{3,.} < D_{2,.}$ and that $D_{2,.} < D_{1,.}$. However, the decision rule criterion must be applied to determine practical significance.

The decision rule for practical significance can be applied to the mean item difference scores for each of the D distributions. For Hypothesis 1, values were found for D_i where $\underline{i}$ = spouse, friend, co-worker. Since D_i^2 is composed of three scales which are based upon different numbers of items, D_i^2 must be decomposed into three segments which reflect homogeneous item score differences across the segments. The following equation holds where $\underline{x}$ is the constant mean item score difference:

$$\bar{D}_i = \sqrt{(15x)^2 + (10x)^2 + (13x)^2} \qquad (12)$$

Solving for $\underline{x}$,

$$x = \sqrt{\frac{\bar{D}_i^2}{494}} \qquad (13)$$

These theoretical constant mean item score differences for the subpopulations of length and type of relationship (Hypotheses 1 and 2) are shown in Table 18. In order to demonstrate a practically significant difference between the mean distance scores $\overline{D}_i$, the difference between the mean item difference scores had to be greater than .5. Since all of the differences among the mean item difference scores are far less than .5 (the largest being $D_C - D_{Sp} = .97 - .88 = .09$), none of these differences are even close to meeting the criterion of practical significance as set by the decision rule.

Tables 19 and 20 provide the descriptive statistics as they apply to the distributions of D in each of the cells of the 3-by-3 table of type-by-length. Since the means for these distributions are very similar to those for the marginals (Tables 16 and 17), then there are also no practically significant differences among the means of these distributions. Thus, neither main effects nor interaction effects are reflected in the table.

Analysis of variance. The source table for the type-by-length unweighted means ANOVA is presented in Table 21. The results demonstrate no significant effects, even with the large sample sizes. However, the extremely wide range of cell sizes (7 to 2,653; see Table 14 or 15) could have been responsible for

Table 18

Mean item score differences for distributions of D
associated with Hypotheses 1 and 2

Distribution	Mean Item Score Differences	Percentage of Total Interval
D_{Sp}	.88	12.6
D_F	.96	13.7
D_C	.97	13.9
D_3	.94	13.4
D_2	.97	13.9
D_1	.98	14.0

Table 19

Descriptive statistics about distributions of raw D scores
associated with Hypotheses 1 and 2 (cells)

Distribution	Number of cases	Mean	Standard error of the mean	Standard Deviation
$D_{Sp,3}$	1,686	19.57	.23	9.62
$D_{Sp,2}$	88	19.39	.95	8.90
$D_{Sp,1}$	7	21.41	4.54	12.01
$D_{F,3}$	2,653	21.06	.19	9.95
$D_{F,2}$	1,423	21.52	.27	10.22
$D_{F,1}$	384	22.06	.51	9.99
$D_{C,3}$	1,920	21.31	.23	10.01
$D_{C,2}$	1,891	21.74	.24	10.24
$D_{C,1}$	712	21.54	.38	10.09

(continued)

Table 19 (continued)

Distribution	Theoretical Bounds		Extreme Values		Kurtosis	Skewness
	Lower	Upper	Min.	Max.		
$D_{Sp,3}$	0.00	133.36	1.00	67.83	1.60	.91
$D_{Sp,2}$	0.00	133.36	4.36	42.30	-.59	.45
$D_{Sp,1}$	0.00	133.36	6.16	37.82	-1.12	.12
$D_{F,3}$	0.00	133.36	1.41	65.77	.48	.72
$D_{F,2}$	0.00	133.36	1.41	78.31	1.28	.89
$D_{F,1}$	0.00	133.36	1.00	52.78	-.15	.43
$D_{C,3}$	0.00	133.36	0.00	73.68	.95	.78
$D_{C,2}$	0.00	133.36	2.45	67.97	.96	.86
$D_{C,1}$	0.00	133.36	2.24	63.71	.69	.70

Table 20

Descriptive statistics about distributions of normalized D scores
associated with Hypotheses 1 and 2 (cells)

Distribution	Number of Cases	Mean	Standard error of the mean	Standard Deviation
$D_{Sp,3}$	1,686	-.15	.02	.96
$D_{Sp,2}$	88	-.17	.09	.89
$D_{Sp,1}$	7	.03	.45	1.20
$D_{F,3}$	2,653	-.01	.02	.99
$D_{F,2}$	1,423	.04	.03	1.02
$D_{F,1}$	384	.10	.05	.99
$D_{C,3}$	1,920	.02	.02	1.00
$D_{C,2}$	1,891	.06	.02	1.02
$D_{C,1}$	712	.04	.04	1.00

(continued)

Table 20 (continued)

| Distribution | Theoretical Bounds | | Extreme Values | | Kurtosis | Skewness |
	Lower	Upper	Min.	Max.		
$D_{Sp,3}$	-2.10	11.17	-2.00	4.65	1.60	.91
$D_{Sp,2}$	-2.10	11.17	-1.67	2.11	-.59	.45
$D_{Sp,1}$	-2.10	11.17	-1.49	1.66	-1.12	.12
$D_{F,3}$	-2.10	11.17	-1.96	4.44	.48	.72
$D_{F,2}$	-2.10	11.17	-1.96	5.69	1.29	.89
$D_{F,1}$	-2.10	11.17	-2.00	3.15	-.15	.43
$D_{C,3}$	-2.10	11.17	-2.10	5.23	.95	.78
$D_{C,2}$	-2.10	11.17	-1.86	4.66	.96	.86
$D_{C,1}$	-2.10	11.17	-1.83	4.24	.69	.70

Table 21

Source table for type-by-length unweighted means ANOVA
used in testing Hypotheses 1 and 2

Source	Sum of Squares	df	Mean Square	F	p
Type	224.20	2	112.10	1.12	ns
Length	96.89	2	48.45	.48	ns
Type by Length	77.14	4	19.29	.19	ns
Residual	1,075,205.30	10,755	99.97		
Total	1,075,603.53	10,763			

washing out the statistical significance expected from the large sample size. Another obvious factor at work was the lack of any practical effects as demonstrated by the limited range of cell means (19.39 to 22.06) and resulting small sample mean variances.

Hypothesis 3

A test of Hypothesis 3 requires examination of the differences in scale scores for "selves" and "others." The descriptive statistics for each of the three scale means from Form A and Form B are shown in Table 22. The results of three t tests for differences between the scales is shown in Table 23.

The direction of the inequality of the sample means for BS and BO is opposite to that predicted by $H_{A_{31}}$. However, even though the difference between the sample means is statistically significant (for a two-tailed test), inspection of the sample means and related descriptive statistics reveals very little practical difference between the distributions. The difference between the two sample scale means is less than one, and the difference would have to be greater than 7.5 to be practically significant by the decision rule. Thus, $H_{o_{31}}$ cannot be rejected on a practical basis.

The inequality of the sample means for TS and TO is in the direction predicted by $H_{A_{32}}$ and statistically significant.

Table 22

Descriptive statistics about distributions of scale scores used in
testing Hypotheses 3 and 4 (total sample)

Distribution	Number of cases	Mean	Standard error of the mean	Standard Deviation
BS	3,613	52.03	.25	15.14
BO	3,613	51.11	.19	11.66
TS	3,613	46.53	.17	9.83
TO	3,613	45.87	.11	6.76
RS	3,613	52.43	.20	11.88
RO	3,613	52.26	.15	9.09

(continued)

Table 22 (continued)

Distribution	Theoretical Bounds		Extreme Values		Kurtosis	Skewness
	Lower	Upper	Min.	Max.		
BS	5	95	6	95	-.28	.05
BO	5	95	7	88	-.16	.02
TS	20	80	20	80	-.16	.27
TO	20	80	25.5	74	.44	.43
RS	11	89	15	89	-.26	-.08
RO	11	89	18.7	82	.03	-.02

Table 23

Results of $\underline{t}$ tests for correlated means used
in testing Hypothesis 3

Null Hypothesis	df	t	p	r	p
$\mathcal{M}_{BS} \leq \mathcal{M}_{BO}$	3,612	4.61	< .01	.63	< .01
$\mathcal{M}_{TS} \geq \mathcal{M}_{TO}$	3,612	4.58	< .01	.52	< .01
$\mathcal{M}_{RS} \geq \mathcal{M}_{RO}$	3,612	1.00	ns	.51	< .01

However, inspection of the sample means and related descriptive statistics for TS and TO reveals little practical difference between those distributions. The difference between the two sample scale means is less than one (the least significant practical difference for this scale being greater than 5), and $H_{o_{32}}$ cannot be rejected on a practical basis.

The inequality of the sample means for RS and RO is in the direction predicted by $H_{A_{33}}$, but, in this case, the difference is not statistically significant, even with the power of the test to detect a difference. A comparison of the descriptive statistics for the distribution of RS and RO also reveals no practical differences between those distributions. As was true for the other two scales, the difference between the two sample scale means is less than one (the least significant practical difference being greater than 6.5), and $H_{o_{33}}$ cannot be rejected on a practical basis.

Hypothesis 4

The descriptive statistics related to distributions of self and other scale scores are found in Table 22. Table 24 contains the added information of 95% confidence intervals for the population means of the same six scale scores. Since each confidence interval was constructed on the basis of a very large

Table 24

Confidence intervals for the mean used in testing
Hypothesis 4 (total sample)

Parameter estimated	95% confidence interval
μ_{BS}	51.53 - 52.52
μ_{BO}	50.73 - 51.49
μ_{TS}	46.21 - 46.85
μ_{TO}	45.65 - 46.09
μ_{RS}	52.05 - 52.82
μ_{RO}	51.96 - 52.55

number of cases (N = 3,613), the fact that the indeterminate scale score of 50 is not included in any of the intervals cannot be taken as sufficient evidence that the null hypotheses can be rejected in a practical sense (see discussion below). However, the inequalities between each sample mean and 50 are in the direction predicted by each of the alternate hypothesis. This outcome establishes the existence of effects (however small) in the predicted directions.

Since the theoretical bounds in the three scale scores differ, examination of the obtained mean item scores for each distribution gives a better understanding of the absolute difference between an indeterminate score and the obtained scores. Table 25 demonstrates that the largest difference between an obtained item mean and the indeterminate item score of 4 is that associated with TO (3.59 - 4.00 = -0.41). This quantity indicates that, for an "average" individual, approximately 4 of the 10 P-T scale items were scored one interval on the practical side, while the other 6 scale items were indeterminate. The result for TS is approximately the same, while the results for the other four distributions (BS, BO, RS, and RO) are even less notable. Since none of the absolute values of these mean item score differences reaches the decision rule criterion of being greater than .5, none of these differences can be considered practically significant. Thus, on a practical basis, none of the null hypotheses

Table 25

Item score statistics used in testing
Hypothesis 4 (total sample)

Distribution	Indeterminate Item Score (1)	Obtained Mean Item Score (2)	$\|(1) - (2)\|$
BS	4.00	4.16	.16
BO	4.00	4.07	.07
TS	4.00	3.65	.35
TO	4.00	3.59	.41
RS	4.00	4.20	.20
RO	4.00	4.19	.19

$H_{O_{41A}}$, $H_{O_{43A}}$, $H_{O_{41B}}$, nor $H_{O_{43B}}$ can be rejected, while stronger

evidence exists to reject $H_{O_{42A}}$ and $H_{O_{42B}}$.

The results of the analyses of the distributions of the six scale scores as they applied to the subpopulation of management seminar participants are shown in Tables 26, 27, and 28. However, since the raw item scores for this sample were not available, the data shown are those based upon the original scale scores (based on all 45 items). Thus, the T-R scale scores are the same in both cases, but the P-T and D-I scales are based upon all 15 original items in the Inventory. The effect on the results should be negligible, however, since most of these "extra" items did not grossly violate the criteria for inclusion in the scale. In addition, they made up a minority of the total scale items.

In every case the direction of the inequalities between the sample means and 50 is in the predicted direction, and the differences are even more pronounced than with the original, more heterogeneous sample. With this smaller sample, the population means are much less precisely established, but only one 95% confidence interval for the mean actually contains 50--that for BO. The mean item score deviations from the indeterminate score of 4 are approximately twice as large as those for the original sample. These increases in deviations resulted in the

Table 26

Descriptive statistics about distributions of scale scores used in testing Hypothesis 4 (management sample)

Distribution	Number of cases	Mean	Standard error of the mean	Standard Deviation
BS	100	54.45	1.36	13.55
BO	100	51.09	1.08	10.81
TS	100	40.69	1.11	11.07
TO	100	40.86	.67	6.68
RS	100	57.49	1.20	12.04
RO	100	54.26	.95	9.54

(continued)

Table 26 (continued)

| Distribution | Theoretical Bounds | | Extreme Values | | Kurtosis | Skewness |
	Lower	Upper	Min.	Max.		
BS	5	95	25	87	-.54	-.04
BO	5	95	27	77	-.03	.06
TS	5	95	11	72	.40	-.08
TO	5	95	24	62	.41	.02
RS	5	95	27	82	-.03	-.30
RO	5	95	26	81	.37	-.09

Table 27

Confidence intervals for the mean of scale scores used
in testing Hypothesis 4 (management sample)

Parameter estimated	95% confidence interval
BS	51.76 - 57.14
BO	49.75 - 54.05
TS	38.49 - 42.89
TO	39.53 - 42.19
RS	55.10 - 59.88
RO	52.37 - 56.15

Table 28

Item score statistics used in testing
Hypothesis 4 (management sample)

Distribution	Indeterminate Item Score (1)	Obtained Mean Item Score (2)	$\|(1) - (2)\|$
BS	4.00	4.30	.30
BO	4.00	4.13	.13
TS	4.00	3.38	.62
TO	4.00	3.39	.61
RS	4.00	4.50	.50
RO	4.00	4.28	.28

distributions of TS, TO, and RS exceeding the decision rule criterion of having a mean item score difference of .5. Thus, for the subgroup of management seminar participants, a bias in favor of practical thinking was found for both "selves" and "others," while a bias in favor of independent risking was found for "selves."

CHAPTER VI

DISCUSSION

Factor Analysis of the Bi/Polar
Inventory of Strengths

The factor analysis of the Bi/Polar Inventory of Strengths
revealed a structure of three orthogonal dimensions. To a large
extent, items which were designed to have high primary loadings
on the same factor did, and the 3-factor principal axis solu-
tion most closely resembled simple structure (as indicated by the
VSS criterion). Thus, the Inventory exhibited a structure close
to the aim of its original design.

Other well-documented personality tests or inventories
assess constructs which are similar to those assessed by the Bi/
Polar Inventory. Comparison of the underlying constructs in both
empirical and conceptual terms can help to clarify the meaning of
all constructs involved. However, since personality trait assess-
ment instruments have been constructed for widely varying pur-
poses and from different points of view, any comparison of
instruments must take into account differences of construction
and design as well as differences and similarities in the hypotheti-
cal constructs underlying the inventories.

To better reveal its nature, the Bi/Polar Inventory was
compared to the GZTS, Guilford-Zimmerman Temperament Survey

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(Guilford, Zimmerman, & Guilford, 1976) and the 16PF, Sixteen
Personality Factor Questionnaire (Cattell, Eber, & Tatsuoka,
1970). The GZTS was chosen because Mayo and Thomas (1975) have
reported data pertaining to the correlation of its scales with
the Bi/Polar scales. The 16PF was chosen because it was developed
to assess all possible personality traits. No data exist for
comparing the 16PF and the Bi/Polar Inventory, but comparison of
the two in conceptual terms would indicate the ability of the
Inventory to assess a very wide variety of personality charac-
teristics.

The GZTS was originated with the purpose of identifying
one hypothesized personality trait--that of introversion-
extraversion. Variables were added to the instrument as research
findings or theoretical developments suggested the existence of
other traits. The final ten traits assessed by the GZTS are
identified as: G (general activity), R (restraint), A (ascen-
dance), S (sociability), E (emotional stability), O (objectivity),
F (friendliness), T (thoughtfulness), P (personal relations), and
M (masculinity).

Mayo and Thomas (1978) reported a study of 59 executive
applicants to whom both the Bi/Polar Inventory and the GZTS were
administered. Correlations equal to or greater than .30 existed
between the Bi/Polar T-R scale and the G, A, E, and P scales of
the GZTS. The G scale represents the qualities of enthusiasm,

quickness to action, and rapid pacing of activities, and this relates very readily to the decisive, moving, action-oriented characteristics found in the risking strength. The "wanting to be conspicuous" trait of the A scale also relates to the risking strength, but the leadership and self-defense characteristics suggest a stronger theoretical relationship to the D-I scale (with which there was almost no correlation). The E scale is composed of qualities of optimism, cheerfulness, and excitability-- these traits are more readily associated with riskers (who readily express emotions) than with thinkers (who tend to be more restrained and to hide their feelings). The P scale represents faith in institutions and tolerance of people; to a certain extent, riskers have these traits, whereas thinkers will tend to analyze and pay attention to those limitations they see in others.

No correlations between the P-T scale and GZTS scales exceeded .30, and, for the D-I scale, only the correlations with the E scale reached this criterion. Since dependent risking involves some of the qualities of self-depreciation and lack of self-confidence, then dependent risking should be negatively associated with the E scale.

The T scale is the most clearly conceptually related scale to any of the Bi/Polar scales, and the correlations with the T-R scale (-.29) and the D-I scale (-.24) reflect a small relationship. The correlation with the T-R scale exists because

the T scale is composed of items which assess an interest in
the thinking vs. interest in overt activity dimension. However,
the T scale is also composed of items which assess a person's
inclination to observe other people's behavior and one's own
behavior, and this quality of being self- or other-focused is
primarily related to the D-I scale. Thus, the correlations of
the T scale with both the T-R scale and the D-I scale may have
been due to their associations with differential parts of the T
scale.

The 16PF was constructed from a totally different
approach from either the GZTS or the Bi/Polar Inventory. Instead
of proceeding from a theoretical base and choosing items to
represent hypothesized personality constructs, Cattell began
with a large pool of items purporting to represent the whole
personality sphere. Thus, the 16 factors underlying the 16PF
are the result of an effort to include all possible personality
traits. The 16 traits identified by the 16PF are: A (reserved-
outgoing), B (dull-bright), C (affected by feelings-emotionally
stable), E (humble-assertive), F (sober-happy-go-lucky), G
(expedient-conscientious), H (shy-venturesome), I (tough-minded-
tender-minded), L (trusting-suspicious), M (practical-imaginative),
N (forthright-astute), O (self-assured-apprehensive), Q_1 (con-
servative-experimenting), Q_2 (group-dependent, self-sufficient),
Q_3 (undisciplined-self-conflict-controlled), and Q_4 (relaxed-

tense). In addition, six identifiable higher-order factors are:
QI (extraversion-introversion), QII (low anxiety-high anxiety),
QIII (sensitivity, emotionalism-tough poise), QIV (dependence-
independence), QVII (fluid intelligence), and QVIII (superego).
The primary factors involved in each are: QI (A+, E+, F+, H+,
Q_2-), QII (C-, H-, L+, O+, Q_3-, Q_4+), QIII (A-, I-, M-), QIV
(E+, L+, M+, Q_1+, Q_2+), QVII (B+), and QVIII (G+, Q_3+, F-).
Since Cattell prefers factors to be oblique under the assumption
that naturally occurring traits will be correlated, particular
attention will be paid to the less numerous, less correlated
secondary factors. Comparisons with Bi/Polar scales will be on
a theoretical level since no experimental data exist.

The clearest and most directly interpretable relationship
is that between the Bi/Polar D-I scale and the QIV scale which
Cattell labels as dependence vs. independence. The QIV scale is
composed of those primaries that recall the qualities of indepen-
dence, assertiveness, competitiveness, and self-sufficiency--the
same qualities that are indicative of the Bi/Polar independent
risking construct. However, the QIV factor also demonstrates
imaginativeness (primary factor M) which is clearly associated
with Bi/Polar theoretical thinking.

The T-R scale relates most readily to secondary factor
QI, because primary factors A (reserved-outgoing), F (serious-

enthusiastic), and H (shy-venturesome) recall the qualities
inherent in the thinking-risking polarity. Since QI is identi-
fied by Cattell as the extraversion-introversion dimension, the
Bi/Polar thinking-risking pair of strengths should be concep-
tually related to some degree to the concept of introversion-
extraversion. The similarities exist because the thinking
strength implies a propensity for a cognitive experience of the
world, while the risking strength imparts a need for experiential
understanding. Thus, thinkers will tend to be less active and
more satisfied with less actual worldly interaction, whereas
riskers need to be impacted upon and to have an impact on the
world. In addition, primary factors E and Q_2 (the other factors
comprising QI) also imply a characteristic of noninteraction
which is associated with the thinking strength. But it should be
noted that factors E and Q_2 are more closely associated with the
D-I scale, and thus the dependent-independent risking strength
polarity is also theoretically associated with extraversion-
introversion.

The P-T scale is clearly related to primary factor M
(practical-imaginative). However, factor M is associated only
with secondary factors QIII and QIV, a fact which is contrary
to expectations derived from the factor analysis of the Bi/Polar
Inventory. Obviously, the practical-theoretical thinking
dimension is much more salient in the Bi/Polar schema than the
practical-imaginative dimension is to the 16PF.

The Bi/Polar Inventory of Strengths appears to be assessing some of the same personality characteristics being assessed by both the GZTS and 16PF. This observation is not surprising since all three are designed to assess "personality traits" and research has indicated positive associations among all three. However, each has been constructed and designed according to individually specified criteria, and a perfect correspondence would not be expected.

Reliability of the Bi/Polar
Inventory of Strengths

To determine whether the calculated reliability coefficients of the Bi/Polar Inventory of Strengths are high enough to indicate that it actually is an internally consistent instrument, comparisons will be made between the obtained values of coefficient alpha for the Bi/Polar Inventory and similar values for both the GZTS and the 16PF. Since these two inventories have been developed and refined over many years, the reliabilities reported for them can be considered a sufficient criterion to establish reliability or consistency in a personality inventory.

The only reported values of coefficient alpha for the GZTS were reported by Stricker (1969) in a study of 91 females: F, .84; S, .85; E, .85; and P, .80. In addition, estimations of reliability for all 10 scales by the split-half and Kuder-

Richardson methods in a study of 912 college students (Guilford
& Zimmerman, 1949) resulted in a range of values from .75 to .87.
These values are very similar to the range and mean values of
coefficient alpha reported in the present research for the Bi/
Polar scales.

Test-retest reliabilities were reported for the 16PF
on replications of parallel forms A and B on 79 employment
counselors and 67 undergraduate students. The range for the
sixteen scales on combined Forms A and B was from .65 to .91,
while the range for A was from .58 to .83 and for B was from
.54 to .89. The Bi/Polar Inventory compares favorably to the
16PF in terms of overall reliability.

Hypotheses 1 and 2

The most surprising result of the data analysis was
that the D scores were so homogeneous across groups, since on
theoretical and empirical grounds, the D scores were expected to
have evidenced some practical differences. Comparison of mean
item difference scores provides an opportunity to analyze D
scores at the item level (see Table 18). As in the case of over-
all D scores, the results indicated differences in the predicted
directions (suggesting a small main effect for each hypothesis),
but the similarity of the mean item difference scores is still
quite evident. These results simply do not support the hypothesis

that self-other agreement is influenced by the closeness and the length of the relationship.

If there are indeed no differences in self-other agreement across the various categories analyzed, then the theoretical bases upon which the differences were postulated to occur need to be re-examined. The fact that all Form B respondents (i.e., all "others") can perceive a person only in a limited situational and temporal context may be an overriding barrier over which the advantages in perception by type and length of relationship have little effect. In terms of Bem's theory, the differences in perception of the self between the self and others may be much greater than the differences among others in perceiving the self. Thus, there is an effect but a very small one compared to the absolute amount of self-other discrepancy.

A rival hypothesis which could account for there being no detectable differences between the six samples of self-other agreement is that one or two of the scales are in greater or lesser agreement than are the remaining scale(s), depending on the particular subpopulation. For example, if all the differences in perception for spouses were contained solely with the T-R scale, then an analysis of only T-R scales would demonstrate very divergent perceptions, while analysis of the P-T and D-I scales would indicate perfect self-other agreement. Thus, $\overline{D}_{Sp}$

could be composed solely of the mean of the absolute value of
T-R scale score differences, or

$$\overline{|(B_{Sp} - B_{Self})|} = \overline{D}_{Sp} = 19.564 \qquad (14)$$

(Note that in this case, the sum of the absolute values of the
differences in the scale scores, 19.564, is much less than the
theoretical case of exactly equal item contribution to D,
33.44.)

In order to determine whether or not radical differences
in perception between groups are found when considering each
scale, it is necessary to see how closely the obtained mean
scale score differences agree with the expected values based upon
the equal item contribution assumption. These data are found in
Table 29. The same information as it applies to mean item score
differences is found in Table 30. Table 31 shows the ratios of
the expected mean D scale (or item) values to the actual mean D
scale (or item) values. The E/A ratio ranges from the situation
in which the D_i is wholly determined by that scale to the situa-
tion in which there is total agreement and the scale makes no
contribution to D_i. Thus, the lower and upper bounds for a
particular scale are E_i/D_i and ∞, respectively. A score of
unity indicates a perfect match of expected to obtained values.
Equality of the E/A ratios between combinations of distributions

Table 29

Mean D scores by scale: Actual values and expected values
under the equal contribution assumption

Distribution	Mean D by scale					
	T-R		P-T		D-I	
	Expected	Actual	Expected	Actual	Expected	Actual
D_{Sp}	13.20	11.15	8.80	8.03	11.44	9.99
D_F	14.40	12.38	9.60	8.78	12.48	11.01
D_C	14.55	12.48	9.70	8.78	12.61	11.30
D_3	14.10	11.88	9.40	8.49	12.22	10.62
D_2	14.55	12.52	9.70	8.66	12.61	11.26
D_1	14.70	12.79	9.80	9.05	12.74	10.98

Table 30

Mean D scores by scale item: Actual values and expected values
under the equal contribution assumption

Distribution	Mean D by scale item							
	T-R		P-T		D-I			
	Expected	Actual	Expected	Actual	Expected	Actual		
D_{Sp}	.88	.74	.88	.80	.88	.77		
D_F	.96	.83	.96	.88	.96	.85		
D_C	.97	.83	.97	.88	.97	.87		
D_3	.94	.79	.94	.85	.94	.82		
D_2	.97	.83	.97	.87	.97	.87		
D_1	.98	.85	.98	.91	.98	.84		

Table 31

Ratios of expected mean scale (or item) score differences
to actual mean scale (or item) score differences

| Distribution | E/A Ratios | | |
	T-R	P-T	D-I
D_{Sp}	1.19	1.10	1.14
D_F	1.16	1.09	1.13
D_C	1.17	1.10	1.12
D_3	1.19	1.11	1.15
D_2	1.17	1.12	1.12
D_1	1.15	1.08	1.12

and scales constitutes a rough indicator of equal item and scale contribution to D.

The data indicate that the P-T scale is contributing slightly more to the D score than either the T-R scale or the D-I scale, while the D-I scale is contributing slightly more than the T-R scale. The differences do not appear to be practically significant, however, and the inequalities of contributions hold up across groups. In fact, the differences in contribution are in the direction one might expect because of the differences in scale reliabilities. The hypothesis that strong differences in self-other agreement exist differentially across the three scales can be rejected.

The D statistic has similarities to other methods of analysis used in previous self-other agreement studies--mainly correlation coefficients and t tests. Since the empirical research reported in the literature generally supported differences in self-other agreement along the lines of relationship, the D statistic should be further compared to these other methods of analysis used to measure self-other agreement. In other words, if the differences in the present study had been analyzed using comparisons of correlations and absolute values of mean differences, would the same conclusion of no large differences in self-other agreement be reached?

Funder (1980) analyzed self-other agreemtn in the form of $\underline{t}$ tests and correlation coefficients (see pp. 34-35). He concluded that many instances of self-other agreement were found, based on the significant correlations obtained and relatively few significant $\underline{t}$ test results. Results of $\underline{t}$ tests and tests of significance of the correlation coefficients have been omitted for the present data because the large $\underline{N}$'s distort the intended meaning of significance tests. However, examination of Table 32 reveals that correlation coefficients and absolute values of mean differences would indicate an even greater overall agreement for the present data between selves and other, when, in fact, the D statistic (through the mean item score difference) indicates much less agreement (see Table 18). A decision rule for practical significance based on the criterion of more than half the items being at least one interval apart would classify all of the D scores as being significantly different from zero.

Analyzing only absolute values of differences or only correlations can also lead to contradictory conclusions. For example, the absolute values of the mean differences on the T-R scale between the self and the three categories of others indicate greater amounts of agreement in the order of spouse, friend, and co-worker, whereas the correlations indicate the exact opposite order (see Table 32). The contradictory

Table 32

Descriptive statistics about differences in self-other
agreement on three scales for six subpopulations

| | | Scale | | | | | |
| | | T-R | | P-T | | D-I | |
Subpopulation	N	$\overline{|D|}$	r	$\overline{|D|}$	r	$\overline{|D|}$	r
Spouse	1,779	2.48	.61	0.51	.50	2.27	.52
Friend	2,470	0.82	.48	0.86	.33	0.26	.35
Co-worker	2,329	0.53	.44	0.68	.31	1.24	.30
More than 3 years	3,274	0.68	.51	0.56	.38	0.62	.39
1 - 3 years	2,183	0.87	.46	0.62	.35	1.03	.31
Less than 1 year	859	1.21	.42	1.68	.25	1.66	.34

conclusions can be reached because t tests and correlation
coefficients assess two different aspects of "agreement," whereas
the D statistic is sensitive to both. Thus, in this example,
homogenous D scores were obtained because the amount of agree-
ment considering mean differences and correlations simultaneously
was approximately the same for all three groups.

There are two unlikely explanations which could account
for not detecting large differences between others which actually
do exist. The first is that the Bi/Polar Inventory really does
not measure any constant, identifiable personality constructs,
and the D's simply represent the distribution of scores con-
structed from random responses to the inventory items. This
explanation can be challenged on the grounds that the factor
analysis clearly demonstrated an inherent structure consonant
with the theoretical expectations and that the scales demonstrated
significant internal-consistency reliability. In addition,
validity studies have been cited which support the intended pur-
pose of the Inventory.

The second unlikely explanation is that the traits or
characteristics assessed by the Inventory belong to that group
of traits on which there are no differences in self-other agree-
ment, but that there exist other traits for which significant
self-other differences do exist. Since the constructs which the
Inventory purports to assess have been shown to have similarities

to a wide range of constructs underlying other well-known personality assessment instruments, this explanation is not very plausible.

Limitations of the Present Study

There are two limitations of this study would could plausibly account for there being undetected significant differences in agreement. The first is that people who completed Form A chose their corresponding Form B respondents exactly the way the instructions said to do--to choose people who knew them well. If this is a more salient characteristic of Form B respondents than is their type or length of relationship with the Form A respondent, then the results would naturally be biased in favor of similar D scores. In other words, the samples in this study may not be truly random representations of the populations from which they were drawn. Some evidence of this might be indicated by the fact that the sample N's rapidly increase as the categories of the length of the relationship include longer relationships. Relatively few people with length of relationship less than 1 year may have been chosen because fewer in that category than the other categories knew the person well.

The second plausible limitation is that type and length categories employed in this study are not truly representative

of the theoretical dimensions delineated by Bem. For instance,
spouses and friends might be very similar in the amount of
intimate information which passes between them and the self. If
this situation exists, then no differences in self-other agree-
ment would be expected. It may also be that, after having known
a person for a certain length of time, an "other" gains no more
important information about the personality characteristics of a
"self." Thus, if it were true that everything that an "other"
can know about a "self" is known within six months, then the
categories in the present study would not have been sensitive to
time differences. However, more information would have to be
known about these categories in order to have confidence in this
explanation.

Hypothesis 3

The results for Hypothesis 3 demonstrated very little
support for attribution theory. One of the inequalities between
the means was opposite to that expected, and all of the dif-
ferences between the respective sample means were less than one
scale unit. Thus, there was very little difference between selves
and others in their propensities to choose inwardly or outwardly
observable traits to apply to the self.

If differences actually do exist, then the constructs
which have been labeled in this study as more inwardly or outwardly

observable may have been mislabeled. For example, theoretical thinking may be just as observable as practical thinking if that person communicates his/her ideas vigorously to others. Thus, the lack of a significant effect may be due to the inability of the particular variables in this study to respond to differential attributional responses.

Another possibility is that a phenomenon similar to what Mead postulated is in effect--the self view is totally determined by the generalized other's view of oneself. If this is the case, one would expect the self view to be reflective (within error limits) of the generalized other's view, and this construction of the self view could override any propensity of the self to ascribe inwardly observable characteristics rather than outwardly observable ones. It is worthwhile to note that this congruence of self-generalized other views would also occur if the self were causative of the generalized other's view or if there were a third variable acting on both these views.

Hypothesis 4

A small effect exists in the hypothesized directions for all six alternate hypotheses, and this result could be inter- preted as reflecting a response set of "social valuation" closely related to "social desirability." A rival hypothesis is that people in general do tend to demonstrate the major strengths of

risking, practical thinking, and independent risking rather than thinking, theoretical thinking, and dependent risking. Although all six strengths garner their rewards in our society, the former group do tend to be rewarded more in an economic sense since they are qualities associated with entrepreneurial and (to some extent) managerial characteristics.

The mean item scores obtained for the management seminar group are even further removed from the indeterminate item score than are those of the original group. Since the hypothesized strengths are even more likely to be found within and to be favored by the management group than other seminar participants, this result is not surprising. Another hypothesis which could account for the deviations by the management group is that they were responding to Inventory items not only to choose socially valued characteristics but also to make themselves appear as though they had the strengths and characteristics that they intuitively associated with success in business or management.

Another possible explanation that could account for these results is that the risking, practical thinking, and independent risking strengths are simply easier to recognize or more salient characteristics than are their polar opposites. However, more research would have to be done on the characteristics of the strengths in order to support this explanation.

Implications for Future Research

Future studies of self-other agreement must pay parti-
cular attention to the assessment instruments and the statistics
used in the data analysis. This study has demonstrated that
different conclusions can be drawn depending on whether t tests,
correlations, or D scores are used as the criterion of agree-
ment. More rigorous justification of the use of the various
measures of agreement must be made by analyzing the meaning of
the statistics chosen in terms of the instrument sophistication
and the kind of agreement important to the study. In the absence
of specific reasons to the contrary, a global measure of agree-
ment, such as D scores, should be included with the more limited
analyses involving mean differences and correlation coefficients.
In addition increased precision and accuracy of the instruments
will produce more validity and precisely measured constructs of
the personality.

The criteria for determining who the "others" will be
deserves careful attention. In this study, selves were instruc-
ted to choose others who knew them well. This instruction may
have biased the samples chosen to include only people who
exhibited relatively large self-other agreement. In order to
assess categories of relationships accurately, truly random
samples of those categories need to be made, and this task may

not be so easy to fulfill. If a subject were asked to provide an
acquaintance who is to rate him/her on a personality inventory,
the "others" chosen may always be relatively well known. Thus,
the use of other-report forms for the purposes of research is at
variance with their use in clinical practice. The "others"
chosen in clinical practice should know the "self" well for the
purpose of providing a corraborative view of the "self," while
research (as in the present case) may require "others" who do not
know the "self" well to determine differences existing between
others-perception.

Besides the problem of randomly selecting "others," there
is a constant challenge to justify on theoretical and empirical
grounds categories of relationships purporting to represent
various degrees of closeness (e.g., sometimes co-workers are
best friends). A related issue in selecting categories of the
length of relationship is that there may exist a threshhold of
time of acquaintanceship, beyond which all self-other agreement
levels out. If this threshhold level existed in the present
study and had a value of six months, then this artifact could
have accounted for the lack of differences found here.

Another important variable in any future study would be
the scope of personality constructs assessed. Self-other agree-
ment could be studied in relation to relatively narrow aspects
of the personality (e.g., introversion-extraversion) or could

include a broad range of personality traits (as in the present study). Either approach could be justified as contributing to an understanding of self-other agreement.

Implications for Clincial Practice

One of the inherent limitations in the self-report form of personality inventories is that the validity of the results depends in large part on the ability and willingness of the respondent to provide an accurate assessment of his/her own personality. This study has shown that others typically disagree with a respondent's assessment of him/herself (see page 124). In those instances where there is disagreement and there exist no other criteria by which to judge the accuracy of "self" and "other" views, either the "self" or the "other" view (or neither) may provide the accurate description of the "true self." Thus, including the "other" view along with the "self" view increases the likelihood that the "true self" has been assessed.

Personality inventories which do contain both self- and other-report forms should be used with particular attention being paid to the meaning of the differential responses of various "others." If the purpose of the other-report forms is to provide an external view of the self, while the self-report form provides an internal view, then the selves need to be instructed as to whom to choose to complete the other-reports.

This study has shown that, across the categories of type and length of relationship, it does not matter who is chosen if the main purpose is to provide an external verification of the internal view. However, if the interest lies in the differences between the self view and the view of specific others, then any of those others as categorized by type and length of relationship in this study can be chosen without biasing the resultant amount of self-other agreement.

Some people are concerned when their self-reports are different from other-reports (particularly in the cases of spouse and friends). This study provides evidence that the views of spouses and friends can be just as deviant from the self view as can the views of people whose relationships with the self are less close. The selves can be reassured that any divergent views are not necessarily reflective of a "bad" or "shallow" relationship.

Conclusions

The lack of support for Hypotheses 1 and 2 indicates that the type or length of relationship has no bearing on the degree to which people will disagree with another person's self-perception. Thus, if a personality inventory contains both self- and other-report forms, it makes no difference who the "other"

is in terms of the type and length of relationship if the criterion is to provide a corroborative view of self-perception. These conclusions can be used as a basis on which to provide instructions for a "self" on the issue of which "others" to choose to complete the other-reports. Rather than choosing solely on the basis of those who know him/her well, the more illuminating procedure might be to choose those other-perceptions which would be most interesting to analyze for that particular "self." Thus, the shift in emphasis is from an interest in convergence of perceptions to analyzing the differences in perception.

Hypothesis 3 results imply that selves and others appear to have equal access to the polar strengths within all three pairs of Bi/Polar strengths as they are expressed by the self. Thus, inwardly and outwardly observable traits are equally noticeable by both selves and others.

The results for Hypothesis 4 show that people in general are not significantly biased toward any pole of the three Bi/Polar strengths. But for business people, there is a bias toward the practical thinking and, to a lesser extent, the independent risking poles. Since these strengths are more valued than their opposites in the business world, the result is not surprising.

Understanding the nature of self-other agreement and the degrees to which it is found in various relationships is an important component in analyzing response to self- and other-report forms of personality inventories. But even beyond this important application lies the larger philosophical issue of how to know which is the view of the "true" self: self-perceptions or other-perceptions. The study of self-other agreement is an important avenue through which the "true" self can be known.

APPENDIX A

BI/POLAR® INCORPORATED

Form A

INVENTORY OF STRENGTHS

Seminar No. _____ Participant No. _____ Date _____

Participant's Name _____
(Please Print)

Address _____
     Street   City   State   Zip

____ Sex: (50)   ____ Age: (51)
   (1) male   (1) Less than 15 yrs.
   (2) female   (2) 16-20 yrs.
               (3) 21-30 yrs.
               (4) 31-40 yrs.
               (5) 41-50 yrs.
               (6) 51-60 yrs.
               (7) 61 yrs. or more

DIRECTIONS

This inventory is designed to help you identify some of your characteristics. As you complete the items, you will observe that each descriptive phrase refers to a personality strength. Do not be concerned about being self-critical, since you cannot show yourself to be "bad" or "weak" on this inventory.

Please do not be overly concerned about the precise meaning of any particular word or phrase. Respond in terms of what the words or phrases mean to you in your everyday living. Also, do not be overly concerned about whether you are highly consistent in your responses. Respond to each item as an individual element in the inventory.

On each of the scales in the inventory, place an "x" in the blank which best characterizes you. If you feel you should be placed or rated very close to one or the other end of the scale, place your "x" as follows:

X : ___ : ___ : ___ : ___ : ___

or

___ : ___ : ___ : ___ : ___ : X

If you feel you should be rated close to one or the other end of the scale (but not extremely), place your "x" as follows:

___ : ___ : X : ___ : ___ : ___

or

___ : ___ : ___ : ___ : X : ___

If you feel that both ends of the scale apply equally to you, then place your "x" in the middle space as follows:

___ : ___ : ___ X : ___ : ___ : ___

If you feel that neither end of the scale applies to you, leave the scale blank. However, please try to minimize the number of scales left blank.

Do not place more than one "x" on a single scale. Go ahead and begin.

Mail no later than _____ to: **BI/POLAR, INCORPORATED**
                                             P.O. Box 1237
                                           Richardson, TX 75080

PLEASE TURN THE PAGE OVER TO BEGIN THE INVENTORY.

Do not place more than one "x" on a single scale.

Left		Right	Code
Likes to be independent	: : : : : :	Likes to be part of a group	(05)
Prefers to deal with facts	: : : : : :	Prefers to deal with ideas	(06)
Considers the views of others	: : : : : :	Follows own convictions	(07)
Gets involved	: : : : : :	Analyzes	(08)
Team worker	: : : : : :	Independent	(09)
Reacts quickly	: : : : : :	Gives studied reaction	(10)
Philosophical	: : : : : :	Down to earth	(11)
Gives leadership to a group	: : : : : :	Cooperates with a group	(12)
Thinks in terms of generalities	: : : : : :	Thinks in terms of specifics	(13)
Practical	: : : : : :	Imaginative	(14)
Jumps into decisions	: : : : : :	Looks before leaping	(15)
Values relationships	: : : : : :	Values independence	(16)
Sees things as they could be	: : : : : :	Sees things as they are	(17)
Depends on self	: : : : : :	Depends on others	(18)
Concerned with principles	: : : : : :	Concerned with results	(19)
Holds back	: : : : : :	Charges ahead	(20)
Prefers to work alone	: : : : : :	Prefers to work on a committee	(21)
Decides quickly	: : : : : :	Investigates carefully	(22)
Moves into action	: : : : : :	Plans with care	(23)
Asks for opinions	: : : : : :	Makes own decisions	(24)
Concerned with what others think	: : : : : :	Concerned with maintaining personal standards	(25)
Enthusiastic	: : : : : :	Reserved	(26)
Thinks about the problem at hand	: : : : : :	Thinks about the overall concept	(27)
Evaluates the risk	: : : : : :	Takes the risk	(28)
Concerned with "why" something works	: : : : : :	Concerned with "how" something works	(29)
Likes personal freedom	: : : : : :	Likes affiliation with others	(30)
Tends to evaluate first	: : : : : :	Tends to react first	(31)
Competitive	: : : : : :	Cooperative	(32)
Likes to collect facts	: : : : : :	Likes to theorize	(33)
Does own thinking	: : : : : :	Wants to know what others think	(34)
Active	: : : : : :	Analytical	(35)
Idea-oriented	: : : : : :	Reality-oriented	(36)
Imagines various possibilities	: : : : : :	Looks for the practical way	(37)
Emotionally expressive	: : : : : :	Emotionally reserved	(38)
Seeks support from others	: : : : : :	Uses personal power	(39)
Doer	: : : : : :	Thinker	(40)
Observes what is going on	: : : : : :	Gets actively involved	(41)
Wants to experience	: : : : : :	Wants to understand	(42)
Generates competitive feelings in others	: : : : : :	Generates safe feelings in others	(43)
Thought-oriented	: : : : : :	Action-oriented	(44)
Would enjoy practical subjects such as engineering	: : : : : :	Would enjoy basic research	(45)
Likes to apply the principle	: : : : : :	Likes to construct the principle	(46)
Tends to be self-sufficient	: : : : : :	Is willing to draw upon others	(47)
Describes a situation in general terms	: : : : : :	Describes a situation with specifics	(48)
Dreams about a better tomorrow	: : : : : :	Deals with today's problems	(49)

BI/POLAR® INCORPORATED

Form B

INVENTORY OF STRENGTHS

Seminar No. _____ Participant No. _____ Date _____

Participant's Name _____
(Please Print)

DIRECTIONS

You have been selected by the person named above as one of six people to help identify some of his/her characteristics. As you complete the items, you will observe that each descriptive phrase refers to a personality strength. Do not be concerned about being evaluative, since you cannot show up the person as being "bad" or "weak" on this inventory.

Please do not be overly concerned about the precise meaning of any particular word or phrase. Respond in terms of what the words or phrases mean to you in your everyday living. Also, please do not be overly concerned about whether you are highly consistent in your responses. Respond to each item as an individual element in the inventory.

On each of the scales in the inventory, place an "x" in the blank which best characterizes this person. If you feel that he/she should be placed or rated very close to one or the other end of the scale, you should place your "x" as follows:

X : : : : :

or

: : : : : X
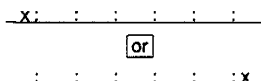
If you feel that they should be rated close to one or the other end of the scale (but not extremely), you should place your "x" as follows:

: : X : : : :

or

: : : : : X :
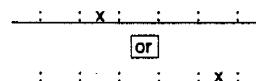
If you feel that both ends of the scale apply equally to this person, then place your "x" in the middle space as follows:

: : X : : :

If you feel that neither end of the scale applies, leave the scale blank. However, please try to minimize the number of scales left blank.

Do not place more than one "x" on a single scale.

Your name: _____
(Please Print)

_____ a. Sex: (50)
    (1) male
    (2) female

_____ b. Your age: (51)
    (1) Less than 15 yrs.
    (2) 16-20 yrs.
    (3) 21-30 yrs.
    (4) 31-40 yrs.
    (5) 41-50 yrs.
    (6) 51-60 yrs.
    (7) 61 yrs. or more

_____ c. Your relationship to this person: (52)
    (1) Spouse
    (2) Relative
    (3) Friend (but not co-worker)
    (4) Co-worker (can be friend, too, of course)
    (5) Other (specify)
    _____

_____ d. How long have you known this person? (53)
    (1) Less than 1 yr.
    (2) 1-3 yrs.
    (3) 4-6 yrs.
    (4) 7-10 yrs.
    (5) 11 or more yrs.

Mail no later than _____ to: **BI/POLAR, INCORPORATED**
P.O. Box 1237
Richardson, TX 75080

PLEASE TURN THE PAGE OVER TO BEGIN THE INVENTORY.

Do not place more than one "x" on a single scale.

Left		Right	
Likes to be independent	_ _ : _ : _ : _ : _ : _ _	Likes to be part of a group	____(05)
Prefers to deal with facts	_ _ : _ : _ : _ : _ : _ _	Prefers to deal with ideas	____(06)
Considers the views of others	_ _ : _ : _ : _ : _ : _ _	Follows own convictions	____(07)
Gets involved	_ _ : _ : _ : _ : _ : _ _	Analyzes	____(08)
Team worker	_ _ : _ : _ : _ : _ : _ _	Independent	____(09)
Reacts quickly	_ _ : _ : _ : _ : _ : _ _	Gives studied reaction	____(10)
Philosophical	_ _ : _ : _ : _ : _ : _ _	Down to earth	____(11)
Gives leadership to a group	_ _ : _ : _ : _ : _ : _ _	Cooperates with a group	____(12)
Thinks in terms of generalities	_ _ : _ : _ : _ : _ : _ _	Thinks in terms of specifics	____(13)
Practical	_ _ : _ : _ : ⁴ : _ : _ _	Imaginative	____(14)
Jumps into decisions	_ _ : _ : _ : _ : _ : _ _	Looks before leaping	____(15)
Values relationships	_ _ : _ : _ : _ : _ : _ _	Values independence	____(16)
Sees things as they could be	_ _ : _ : _ : _ : _ : _ _	Sees things as they are	____(17)
Depends on self	_ _ : _ : _ : _ : _ : _ _	Depends on others	____(18)
Concerned with principles	_ _ : _ : _ : _ : _ : _ _	Concerned with results	____(19)
Holds back	_ _ : _ : _ : _ : _ : _ _	Charges ahead	____(20)
Prefers to work alone	_ _ : _ : _ : _ : _ : _ _	Prefers to work on a committee	____(21)
Decides quickly	_ _ : _ : _ : _ : _ : _ _	Investigates carefully	____(22)
Moves into action	_ _ : _ : _ : _ : _ : _ _	Plans with care	____(23)
Asks for opinions	_ _ : _ : _ : _ : _ : _ _	Makes own decisions	____(24)
Concerned with what others think	_ _ : _ : _ : _ : _ : _ _	Concerned with maintaining personal standards	____(25)
Enthusiastic	_ _ : _ : _ : _ : _ : _ _	Reserved	____(26)
Thinks about the problem at hand	_ _ : _ : _ : _ : _ : _ _	Thinks about the overall concept	____(27)
Evaluates the risk	_ _ : _ : _ : _ : _ : _ _	Takes the risk	____(28)
Concerned with "why" something works	_ _ : _ : _ : _ : _ : _ _	Concerned with "how" something works	____(29)
Likes personal freedom	_ _ : _ : _ : _ : _ : _ _	Likes affiliation with others	____(30)
Tends to evaluate first	_ _ : _ : _ : _ : _ : _ _	Tends to react first	____(31)
Competitive	_ _ : _ : _ : _ : _ : _ _	Cooperative	____(32)
Likes to collect facts	_ _ : _ : _ : _ : _ : _ _	Likes to theorize	____(33)
Does own thinking	_ _ : _ : _ : _ : _ : _ _	Wants to know what others think	____(34)
Active	_ _ : _ : _ : _ : _ : _ _	Analytical	____(35)
Idea-oriented	_ _ : _ : _ : _ : _ : _ _	Reality-oriented	____(36)
Imagines various possibilities	_ _ : _ : _ : _ : _ : _ _	Looks for the practical way	____(37)
Emotionally expressive	_ _ : _ : _ : _ : _ : _ _	Emotionally reserved	____(38)
Seeks support from others	_ _ : _ : _ : _ : _ : _ _	Uses personal power	____(39)
Doer	_ _ : _ : _ : _ : _ : _ _	Thinker	____(40)
Observes what is going on	_ _ : _ : _ : _ : _ : _ _	Gets actively involved	____(41)
Wants to experience	_ _ : _ : _ : _ : _ : _ _	Wants to understand	____(42)
Generates competitive feelings in others	_ _ : _ : _ : _ : _ : _ _	Generates safe feelings in others	____(43)
Thought-oriented	_ _ : _ : _ : _ : _ : _ _	Action-oriented	____(44)
Would enjoy practical subjects such as engineering	_ _ : _ : _ : _ : _ : _ _	Would enjoy basic research	____(45)
Likes to apply the principle	_ _ : _ : _ : _ : _ : _ _	Likes to construct the principle	____(46)
Tends to be self-sufficient	_ _ : _ : _ : _ : _ : _ _	Is willing to draw upon others	____(47)
Describes a situation in general terms	_ _ : _ : _ : _ : _ : _ _	Describes a situation with specifics	____(48)
Dreams about a better tomorrow	_ _ : _ : _ : _ : _ : _ _	Deals with today's problems	____(49)

APPENDIX B

8 PATTERNS OF

I — STABLE and DEPENDABLE

Major Polar Strengths

- *Bi/Polar Thinking*
- *Practical Thinking*
- *Dependent Risking*

DESCRIPTION:

Consistent, cooperative, kind, factual, considerate, good listener, organized, thoughtful, steady, dependable, quiet, practical, cautious, hides feelings, orderly, deliberate, gentle, stable, "live and let live" philosophy, team player, runs loose ship, agreeable, likes people, concerned for others, down-to-earth, accepting, likeable, feet-on-the-ground, accepts advice, maintains status quo.

VOCATIONAL STRENGTHS: Administration of established procedures, gives understanding and practical counsel to others, stable and dependable manager of practical affairs, keeps activities organized, maintains stability.

TYPICAL PROBLEM: Self-confidence, underrates own importance.

II — REALISTIC and INDEPENDENT

Major Polar Strengths

- *Bi/Polar Thinking*
- *Practical Thinking*
- *Independent Risking*

DESCRIPTION:

Objective, feet-on-the-ground, individualistic, reserved, realistic, disciplinarian, self-sufficient, competitive, practical, ambitious, maintains control, bulldog tenacity, loner, runs tight ship, stable leader, efficient, uncompromising, represents the establishment, consistent, blunt, observant, serious, stoic, strong-willed, analytical, critical, holds feelings within, factual, law and order, follows own convictions.

VOCATIONAL STRENGTHS: Provides stable leadership in practical affairs, establishes and maintains control, analyzes a situation realistically and takes independent action to solve the problem, brings efficiency to an organized effort.

TYPICAL PROBLEM: Reliance on others, overly critical of others.

III — THEORETICAL and COOPERATIVE

Major Polar Strengths

- *Bi/Polar Thinking*
- *Theoretical Thinking*
- *Dependent Risking*

DESCRIPTION:

Philosophical, articulate, quiet, intellectual, refined, theoretical, orderly, abstract, accepting, dutiful, avoids conflict, naive, learned, organized, shy, thin-skinned, considerate, cultured, sensitive, understands abstract concepts, idealistic, dependable, academic, hides feelings, soft-spoken, gentle, introspective, scholarly, lives in the world of ideas, knowledgeable.

VOCATIONAL STRENGTHS: Teaches organized knowledge to others, writes textbooks, historical works and poetry, the guardian of cultural values achieved by civilization.

TYPICAL PROBLEM: Self-confidence, exaggerates own weakness.

IV — INVENTIVE and INDEPENDENT

Major Polar Strengths

- *Bi/Polar Thinking*
- *Theoretical Thinking*
- *Independent Risking*

DESCRIPTION:

Imaginative, intelligent, philosophical, theoretical, discovers new ideas, perfectionist, idealistic, ingenious, shy, individualistic, gadgeteer, reserved, sensitive, original, introspective, loner, reflective, rebel, naive, radical, questions established theories, self-sufficient, avoids relationships, creative lone wolf, insightful, subjective, innovator, introvert, abstract, follows own convictions.

VOCATIONAL STRENGTHS: Has original ideas, creates "new theory", takes individual initiative to explore and invent, has "leaps of insight" into unexplored avenues of thought, writes "new theory".

TYPICAL PROBLEM: Reliance on others, difficulty in seeing reality.

POLAR STRENGTHS

V — OUTGOING and PRACTICAL

Major Polar Strengths

- Bi/Polar Risking
- Dependent Risking
- Practical Thinking

DESCRIPTION:

Warm, outgoing, sympathetic, likes people, friendly, aggressively helpful, talkative, emotional, likeable, down-to-earth, concerned for others, soft-sell, practical, service oriented, inspires trust, generous, gregarious, sociable, lives in a world of people, pours oil on troubled waters, coordinator, compromisor, accepting, extrovert, involved with people, sensitive to feelings of others, heart rules reason, diplomatic, likes to work with people, trusts others.

VOCATIONAL STRENGTHS: Ability to work with people, most effective where "people relationships" is the primary concern, develops and maintains long term relationships, effective in "soft-sell" sales situations.

TYPICAL PROBLEM: Lets the demands of others rule life, self-confidence.

VI — OUTGOING and INTUITIVE

Major Polar Strengths

- Bi/Polar Risking
- Dependent Risking
- Theoretical Thinking

DESCRIPTION:

Diplomatic, outgoing, sociable, emotionally expressive, flair for dramatics, joiner, idealistic, witty, feel for people, abstract, optimistic, excitable, changeable, talkative, romantic, flamboyant, uninhibited, heart rules reason, warm, accepting, cultural interests, likes to work with groups, extrovert, subjective, lives in world of people, performer, aggressive in relationships, wears heart on sleeve, imaginative, intuitive.

VOCATIONAL STRENGTHS: Sensitive to the emotional needs and moods of people, ability to perform as an actor, ability to entertain people and maintain good public relations, facility with words and ideas.

TYPICAL PROBLEM: Idealizes people, fails to recognize the reality of their faults.

VII — ASSERTIVE and ENTERPRISING

Major Polar Strengths

- Bi/Polar Risking
- Independent Risking
- Practical Thinking

DESCRIPTION:

Self-starter, forceful, self-confident, competitive, ambitious, dynamic, resourceful, high drive, actionist, enthusiastic, practical, independent, hard driver, impetuous, impatient, stimulates change, seeks freedom and power, aggressive, individualistic, self-reliant, enterprising, debator, lift up by own bootstraps, realistic, takes calculated risks, activator, outspoken, takes the initiative, self-assertive, follows own convictions.

VOCATIONAL STRENGTHS: Provides initiative and "push" for practical projects, gives forceful and dynamic leadership, enterprising and resourceful in achieving tangible results, makes it work, stimulated by difficult challenge, sales, typical entrepreneur.

TYPICAL PROBLEM: Impatient with people, difficulty delegating authority.

VIII — DYNAMIC and PERSUASIVE

Major Polar Strengths

- Bi/Polar Risking
- Independent Risking
- Theoretical Thinking

DESCRIPTION:

Dynamic, persuasive, forceful, idealistic, self-starter, self-confident, aggressive, intuitive feel, competitive, sees potential, pioneer of ideas, visionary, explosive personality, strong emotional impact, active imagination, optimistic, impetuous, emotionally involved, magnetic personality, irrepressible, colorful, spellbinder, promoter, risk taker, enthusiastic, bored with details, charming, attracted by possibilities, subjective, stimulates change.

VOCATIONAL STRENGTHS: Strong personal impact fired by visions of possibility and deep emotional involvement, ability to persuade and promote, gives dynamic leadership to group efforts.

TYPICAL PROBLEM: Talks when should be listening, fails to see practical problems.

APPENDIX C

The data contained on the following five pages consist
of the item means, standard deviations, and intercorrelation
matrix used in the factor analysis and reliability studies.
The data are in the exact form as produced by the SPSS FACTOR
procedure with Options 5 and 8. Thus, item means followed by
standard deviations are written as 80 column records in 8F10.4
format. These data are followed by successive rows (or columns)
of the original correlation matrix R written as 80 column records
in 8F10.7 format.

```
     4.4840       3.5727       3.9625       4.5366       3.9073       3.9020       3.1715       4.4456
     3.4140       3.5029       3.0305       3.2166       3.8779       4.9648       4.0951       4.3218
     4.3936       3.5776       3.6485       4.0049       4.4009       4.7174       3.8576       3.7087
     3.9392       4.4395       3.4282       3.8698       3.5134       4.5814       4.5994       3.8157
     3.8587       4.2930       3.8299       4.6401       4.4544       3.9983       3.4648       4.1887
     4.1814       3.6544       4.6358       3.5157       3.6285
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 .3416794  -.0674451   .3402549  -.1019478   .3343862    .0160362    .0443011   .1975915
-.1016006  -.0027889   .0049561   .4020923  -.0813936    .3744848  -.1020027   .1653924
 .2966468   .0609945   .0754685   .4665144   .3596640  -.0577535    .1052354   .1432105
-.0403372   .3323923   .0084320   .2530186   .0099329    .4404620  -.0251499  -.0308987
-.0678561  -.1740324  1.0000000  -.0268509   .0286017    .0293539    .2271491   .0650069
-.0428975   .1388549   .4250276  -.0844398  -.1010048
 .0004971  -.1261295  -.0269054   .4633592  -.1375342    .3190198  -.3075270   .1836268
-.0374910  -.1194924   .1802159  -.1089040  -.0917071    .1469551  -.1399154   .3766424
-.0798853   .2629002   .3019952   .0143916   .0174475    .3788633  -.1809479   .2468435
-.1060641   .0023067   .2274733   .1163004  -.2345805    .1028787   .5343820  -.1304271
-.1215822   .2706717  -.0268559  1.0000000   .4176533    .3120559   .1048555   .6125180
-.1635127  -.1780845   .1019223  -.0468726  -.1740017
-.1253005   .0763252   .0298032   .4432014  -.1230708    .2206559  -.1449156   .2570334
-.0475977   .0480121   .1479060  -.1161902  -.0011746    .0556310  -.0879002   .3965773
-.1696465   .1924283   .2112029   .0496676   .0570569    .4261776  -.0357305   .2921888
-.0790167  -.1339290   .2054219   .0839087  -.0418666    .0438994    .3525099  -.0564530
-.0060442   .2867578   .0286017   .4176533  1.0000000    .2534972    .0517051   .4694999
-.0430970  -.0091176  -.0220608  -.1207136  -.0942405
 .0018633   .0184325   .0385278   .2803325  -.0191167    .2602310  -.0587973   .1041746
 .0408371   .0646356   .2477153  -.0298079   .0747466    .0353945  -.1202020   .2633528
-.0412628   .2725657   .2923617   .0625474  -.0292135    .2509650  -.1624644   .2572874
-.1025578   .0469898   .2530377   .1639421  -.0001181    .0867597    .3315409   .0488662
 .0543694   .2203808   .0293539   .3120559   .2534972  1.0000000    .1827047   .3219323
-.0946936  -.0901144   .0498064   .0426293   .0588121
 .1635618  -.0438108   .2481575  -.0053935   .2249937    .2169020    .1229830   .2000713
-.0234457   .0177210   .2287573   .2253778   .0476569    .0890519  -.1420496   .2693850
 .1529247   .2247783   .2438147   .1666216   .0558056    .0744820  -.0237016   .1906746
-.0187905   .2197298   .1953413   .5613022   .0218682    .1767757   .0912256   .0963101
 .0759039   .0457077   .2271491   .1048555   .0517051    .1827047  1.0000000   .1224173
-.0695186   .1114410   .1967812   .0068047   .0663780
-.0522098  -.0481466   .0533600   .4074167  -.0637444    .3447303  -.3077983   .1671270
```

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-.0637076  -.0375870   .2556299  -.0320269  -.0911084   .0667961  -.2146735   .4286113
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-.1499534  -.0621386   .3319346   .1446560  -.1556411   .0400699   .5054571  -.1666905
-.1507192   .2340882   .0650069   .6125180   .4694999   .3219323   .1224173  1.0000000
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1.0000000   .1997966  -.0379487   .0405528   .1081448
 .0927301   .1953282   .1152634  -.1516135   .1518759  -.0265256   .2549865   .1132576
 .0313322   .2219886   .0038989   .1049537   .1303749   .0573915   .0526986   .0577893
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 .0749234   .0503608  -.0228564   .1195366   .2447763   .0906308  -.1842442   .2275847
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-.0123551   .4233261  -.0745005   .2702481  -.1065116   .4786501   .0798971  -.0075127
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-.0379487   .0429117  1.0000000  -.0514858  -.0991971
-.0296082   .1621615  -.0731631  -.0011355  -.0407458   .0750977   .0846748  -.1063515
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 .0599754   .0013886   .0939754  -.0365008   .2181212  -.0867773   .0453547   .1649249
 .0921062  -.0041434  -.0844398  -.0468726  -.1207136   .0426293   .0068047  -.0621205
 .0405528   .0310135  -.0514858  1.0000000   .2370262
-.0260236   .3063467   .0086407  -.0649925   .0514477   .0380464   .3022546  -.0715339
 .2119296   .3214829   .1820613  -.0299109   .4337658  -.1468000   .1164421  -.0525745
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 .1430630  -.0028852   .1219982   .0513298   .3205347  -.1056284  -.0734505   .3727582
 .3385988   .0832818  -.1010048  -.1740017  -.0942405   .0588121   .0663780  -.1609219
 .1081448   .1278337  -.0991971   .2370262  1.0000000
```

```
      PROGRAM VSSPRO(TTY,LOADPA2,CORMAT,VSSPA2,TAPE1=TTY,
     +TAPE2=LOADPA2,TAPE6=CORMAT,TAPE7=VSSPA2)
C
C     LOAD CONTAINS NUMBER OF FACTORS AND RELEVANT HIGHEST LOADINGS
C
C     CORMAT CONTAINS MEANS, STANDARD DEVIATIONS, AND ORIGINAL
C     CORRELATION MATRIX AS PRODUCED BY FACTOR PROCEDURE IN SPSS
C     USING OPTICNS 5 AND 8
C
C     THE DEGRADED FACTOR MATRIX IS ARRAYI
      DIMENSION ARRAYI(45,8)
C     THE TRANSPOSE IS ARRAYJ
      DIMENSION ARRAYJ(8,45)
C     THE DEGRADED CORRELATION MATRIX IS ARRAYK
      DIMENSION ARRAYK(45,45)
C     THE SQUARED ELEMENT RESIDUAL CORRELATION MATRIX IS ARRAYM
      DIMENSION ARRAYM(45,45)
C     THE SQUARED ELEMENT ORIGINAL CORRELATION MATRIX IS ARRAYN
      DIMENSION ARRAYN(45,45)
C     THE ORIGINAL CORRELATION MATRIX IS ARRAYL
      DIMENSION ARRAYL(45,45)
C     MEANS AND S.D.'S ARE DISCARDED INTO DUMMY
      DIMENSION DUMMY(8)
C
C     ARRAYL IS SET TO ZERO
C
      DO 195 J=1,45
      DO 195 I=1,45
      ARRAYL(I,J)=0
195   CONTINUE
C
C     THE ORIGINAL CORRELATION MATRIX IS INPUT TO ARRAYL FROM CORMAT
C
      DO 979 KK=1,2
      DO 976 II=1,5
      READ (6,977) (DUMMY(JJ), JJ=1,8)
977   FORMAT (8F10.4)
976   CONTINUE
      READ (6,978) (DUMMY(JJ),JJ=1,5)
978   FORMAT (5F10.4)
979   CONTINUE
      DO 879 KK=1,45
      DO 876 II=1,5
      READ(6,877) (ARRAYL(KK,(II-1)*8+JJ),JJ=1,8)
877   FORMAT (8F10.7)
876   CONTINUE
      READ(6,878) (ARRAYL(KK,40+JJ),JJ=1,5)
878   FORMAT (5F10.7)
879   CONTINUE
C
C     THE MATRICES ARE SET TO ZERO
C
89    DO 10 J=1,45
      DO 10 I=1,45
      ARRAYK(I,J)=0
10    CONTINUE
      DO 20 J=1,8
      DO 20 I=1,45
      ARRAYI(I,J)=0
20    CONTINUE
      DO 30 J=1,45
```

```
      DO 30 I=1,8
      ARRAYJ(I,J)=0
30    CONTINUE
      DO 60 J=1,45
      DO 60 I=1,45
      ARRAYM(I,J)=0
60    CONTINUE
      DO 80 J=1,45
      DO 80 I=1,45
      ARRAYN(I,J)=0
80    CONTINUE
C
C     THE NUMBER OF FACTORS IS ENTERED FROM LOAD
C
      READ(2,666) NFACTOR
666   FORMAT(I1)
      WRITE(7,150) NFACTOR
150   FORMAT(' NFACTOR=',1X,I1)
C
C     THE HIGHEST FACTOR LOADINGS IN EACH ROW ARE ENTERED FROM LOAD
C
C     ARRAYI BECOMES THE DEGRADED FACTOR MATRIX
C
1000  READ(2,333) I, J, ELMNT
333   FORMAT(I2,1X,I1,1X,F7.5)
      WRITE(7,111) I, J, ELMNT
111   FORMAT(' I= ',I2,1X,'J= ',I1,1X,'LOAD= ',F7.5)
      ARRAYI(I,J)=ELMNT
      IF (I.GE.45) GO TO 2000
      GO TO 1000
C
C     THE TRANSPOSE OF THE DEGRADED FACTOR MATRIX IS FORMED (ARRAYJ)
C
2000  DO 40 I=1,45
      DO 40 J=1,NFACTOR
      ARRAYJ(J,I)=ARRAYI(I,J)
40    CONTINUE
C
C     THE DEGRADED CORRELATION MATRIX IS FORMED (ARRAYK)
C
      DO 50 J=1,45
      DO 50 I=1,45
      DO 50 K=1,NFACTOR
      ARRAYK(I,J)=ARRAYK(I,J)+ARRAYI(I,K)*ARRAYJ(K,J)
50    CONTINUE
C
C     ARRAYM IS THE SQUARED ELEMENT RESIDUAL CORRELATION MATRIX
C
      DO 70 J=1,45
      DO 70 I=1,45
      ARRAYM(I,J)=(ARRAYL(I,J)-ARRAYK(I,J))**2
70    CONTINUE
C
C     SRES IS THE MEAN SQUARE FOR DEGRADED CORRELATION MATRIX ARRAYM
C
      I=2
      J=1
      K=0
      SQRES=0
1     SQRES=SQRES+ARRAYM(I,J)
      K=K+1
      J=J+1
```

```
       IF (I.GT.J) GO TO 1
       I=I+1
       IF (I.GT.45) GO TO 2
       J=1
       GO TO 1
2      SRES=SQRES/K
       WRITE(7,100) K,SRES
100    FORMAT(' K=',I4,' SRES=',F12.6)
C
C      ARRAYN IS THE SQUARED ELEMENT ORIGINAL CORRELATION MATRIX
C
       DO 90 J=1,45
       DO 90 I=1,45
       ARRAYN(I,J)=APRAYL(I,J)**2
90     CONTINUE
C
C      SCOR IS THE MEAN SQUARE FOR THE ORIGINAL CORRELATION MATRIX
C
       I=2
       J=1
       K=0
       SQCOR=0
3      SQCOR=SQCOR+ARPAYN(I,J)
       K=K+1
       J=J+1
       IF (I.GT.J) GO TO 3
       I=I+1
       IF (I.GT.45) GO TO 4
       J=1
       GO TO 3
4      SCOR=SQCOR/K
       WRITE (7,200) K,SCOR
200    FORMAT (' K=',I4,' SCOR=',F12.6)
C
C      VSS IS THE VALUE SOUGHT
C
       VSS = 1.0-(SRES/SCOR)
       WRITE(7,300) NFACTOR,VSS
300    FORMAT(' FOR ',I2,' FACTORS, VSS =',F13.10)
       IF (NFACTOR.LT.5) GO TO 89
       STOP
       END
```

BIBLIOGRAPHY

Allport, G. W. Traits revisited. In N. S. Endler and D.
Magnusson (Eds.), Interactional psychology and personality.
New York: John Wiley and Sons, 1976.

Amatora, M. Validity in self-evaluation. Educational and
Psychological Measurement, 1956, 16, 119-126.

Bem, D. J. Self-perception: An alternative interpretation of
cognitive dissonance phenomena. Psychological Review, 1967,
74, 183-200.

Bem, D. J. Self-perception theory. In L. Berkowitz (Ed.),
Advances in experimental social psychology (Vol. 6). New
York: Academic Press, 1972.

Bledsoe, J. C. and Wiggins, R. G. Congruence of adolescents'
self-concepts and parents' perceptions of adolescents' self-
concepts. Journal of Psychology, 1973, 83, 131-136.

Blumberg, H. H. Communication of interpersonal evaluations.
Journal of Personality and Social Psychology, 1972, 23, 157-
162.

Bradley, G. S. Self-serving biases in the attribution process:
A reexamination of the fact or fiction question. Journal of
Personality and Social Psychology, 1978, 36, 56-71.

Breslin, H. B. The relationship between the physically handi-
capped child's self-concept and her peer reputation.

(Doctoral dissertation, Oregon State University, 1968).

Dissertation Abstracts International, 1968, 29, 1493B.

Bruner, J. and Tagiuri, R. The perception of people. In G.

Lindzey (Ed.), Handbook of social psychology. Vol. 2.

Reading, Mass.: Addison-Wesley, 1954.

Burdsal, Jr., C. A. and Schwartz, S. A. The relationship of

personality traits as measured in the questionnaire medium

and by self-ratings. Journal of Psychology, 1975, 91, 173-

182.

Carroll, J. B. Ratings on traits measured by a factored per-

sonality inventory. Journal of Abnormal and Social

Psychology, 1952, 47, 626-632.

Cattell, R. B. The scientific analysis of personality. Chicago:

Aldine, 1966(a).

Cattell, R. B. The scree test for the number of factors.

Multivariate Behavioral Research, 1966, 1, 245-276(b).

Cattell, R. B., Eber, H. W., and Tatsuoka, M. M. Handbook for

Sixteen Personality Factor Questionnaire (16 PF).

Champaign, Ill.: Institute for Personality and Ability

Testing, 1970.

Cattell, R. B. and Vogelmann, S. A comprehensive trial of the

scree and KG criteria for determining the number of factors.

Multivariate Behavioral Research, 1977, 12, 289-325.

Cogan, L. C., Conklin, A. M., and Hollingsworth, H. L. An experimental study of self-analysis, estimates of associates, and the results of tests. School and Society, 1915, 2, 171-179.

Cooley, C. H. Human nature and the social order. New York: Scribner's, 1902.

Cooper, W. H. Conceptual similarity as a source of illusory halo in job performance ratings. Journal of Applied Psychology, 1980, 66, 302-307.

Cooper, W. H. Ubiquitous halo. Psychological Bulletin, 1981, 90, 218-244.

Cronbach, L. J. Response sets and test validity. Educational and Psychological Measurement, 1946, 6, 475-494.

Cronbach, L. J. Further evidence on response sets and test design. Educational and Psychological Measurement, 1950, 10, 3-31.

Cronbach, L. J. Processes affecting scores on "understanding of others" and "assumed similarity." Psychological Bulletin, 1955, 52, 177-193.

Cronbach, L. J. Proposals leading to analytic treatment of social perception scores. In R. Tagiuri and L. Petrullo (Eds.), Person perception and interpersonal behavior. Stanford: Stanford University Press, 1958.

Cronbach, L. J. and Gleser, G. C. Assessing similarity between
profiles. Psychological Bulletin, 1953, 50, 456-473.

Duval, S. and Wicklund, R. A. A theory of objective self
awareness. New York: Academic Press, 1972.

Edwards, A. L. The social desirability variable in personality
assessment and research. New York: Dryden, 1957.

Eisenmann, R., and Robinson, N. Peer-, self-, and test-ratings
of creativity. Psychological Reports, 1968, 23, 471-474.

Festinger, L. A theory of social comparison processes. Human
Relations, 1954, 7, 117-140.

Fey, W. F. Acceptance by others and its relation to acceptance
of self and others: A revaluation. Journal of Abnormal
and Social Psychology, 1955, 50, 274-276.

Fruchter, B. F. Introduction to factor analysis. New Delhi:
Affiliated East-West Press, 1954.

Funder, D. C. On seeing ourselves as others see us: Self-other
agreement and discrepancy in personality ratings. Journal
of Personality, 1980, 48, 473-493.

Goslin, P. A. Accuracy of self-perception and social acceptance.
Sociometry, 1962, 25, 283-296.

Gray, D. F. and Gaier, E. L. The congruency of adolescent self-
perceptions with those of parents and best friends.
Adolescence, 1974, 9, 299-304.

Guilford, J. P., Christensen, P. R., and Bond, N. A. The DF
Opinion Survey. Beverly Hills: Sheridan Supply Co., 1956.

Guilford, J. P. and Zimmerman, D. L. The Guilford-Zimmerman
Temperament Survey. Beverly Hills: Sheridan Supply Co.,
1949.

Guilford, J. S., Zimmerman, W. S., and Guilford, J. P. The
Guilford-Zimmerman Temperament Survey handbook. San Diego:
EdITS Publishers, 1976.

Guttman, L. Some necessary conditions for common factor analysis.
Psychometrika, 1954, 19, 149-161.

Harman, H. H. Modern factor analysis. Chicago: University of
Chicago Press, 1967.

Hase, H. D. and Goldberg, L. R. Comparative validity of dif-
ferent strategies of constructing personality inventory
scales. Psychological Bulletin, 1967, 67, 231-248.

Holland, J. L. The psychology of vocational choice. London:
Blaisdell Publishing Co., 1966.

Horowitz, F. D. The relationship of anxiety, self-concept, and
sociometric status among fourth, fifth, and sixth grade
children. Journal of Abnormal and Social Psychology, 1962,
65, 212-214.

Horowitz, L. M., Inouye, D., and Siegelman, E. Y. On averaging
judges' ratings to increase their correlation with an

external criterion. <u>Journal of Consulting and Clinical</u>
<u>Psychology</u>, 1979, <u>47</u>, 453-458.

Israel, J. Self-evaluation in groups. <u>Acta Sociologica</u>, 1958,
<u>3</u>, 29-47.

Johnson, J. A. The "self-disclosure" and "self-presentation"
views of item response dynamics and personality scale
validity. <u>Journal of Personality and Social Psychology</u>,
1981, <u>40</u>, 761-769.

Jones, E. E. and Nisbett, R. E. The actor and the observer:
Divergent perceptions of the causes of behavior. In Jones,
E. E., Kanouse, D., Kelley, H., Valins, S., and Weiner, B.
(Eds.), <u>Attribution: Perceiving the causes of behavior</u>.
New York: General Learning Press, 1972.

Jones, E. E., Kanouse, D., Kelley, H., Valins, S., and Weiner, B.
(Eds.), <u>Attribution: Perceiving the causes of behavior</u>.
New York: General Learning Press, 1972.

Jorgenson, G. Q. Relationships among self, peer, and teacher
evaluations of motivational dispositions and behaviors in
third grade. (Doctoral dissertation, University of Utah,
1967). <u>Dissertation Abstracts International</u>, 1967, <u>27</u>,
3314A-3315A.

Kaiser, H. F. The varimax criterion for analytic rotation in
factor analysis. <u>Psychometrika</u>, 1958, <u>23</u>, 187-200.

Kaiser, H. F. A second generation Little Jiffy. <u>Psychometrika</u>,
1970, <u>35</u>, 401.

Kaufman, L. and Murphy, N. C. Validation through self and other ratings on dimensions of six nonstressful multi-scaled personality instruments. Journal of Personality Assessment, 1981, 45, 86-89.

Kenrick, D. T. and Stringfield, D. O. Personality traits and the eye of the beholder: Crossing some traditional philosophical boundaries in the search for consistency in all of the people. Psychological Review, 1980, 87, 88-104.

Kinch, J. W. A formalized theory of the self-concept. American Journal of Sociology, 1963, 68, 481-486.

King, L. M., Hunter, J. E., and Schmidt, F. L. Halo in a multi-dimensional forced-choice performance evaluation scale. Journal of Applied Psychology, 1980, 65, 507-516.

Kirk, R. E. Experimental design: Procedures for the behavioral sciences. Belmont, Cal.: Brooks/Cole, 1968.

Landy, F. J., Vance, R. J., Barnes-Farrell, J. L., and Steele, J. W. Statistical control of halo error in performance ratings. Journal of Applied Psychology, 1980, 65, 501-506.

Lomont, J. F. Repressors and sensitizers as described by themselves and their peers. Journal of Personality, 1966, 34, 224-240.

Maddi, S. R. Personality theories: A comparative analysis. Homewood, Ill.: Dorsey Press, 1968.

Manaster, G. J. Adolescent development and the life tasks.

    Boston: Allyn and Bacon, Inc., 1977.

Manis, M. Social interaction and the self-concept. Journal of

    Abnormal and Social Psychology, 1955, 51, 362-370.

Mayo, C. C. and Thomas, J. W. Manual for the Bi/Polar Inventory

    of Strengths. Richardson, Texas: Bi/Polar, Inc., 1978.

Mead, G. H. Mind, self and society. Chicago: University of

    Chicago Press, 1934.

Mischel, W. Personality and assessment. New York: Wiley, 1968.

Mischel, W. Continuity and change in personality. American

    Psychologist, 1969, 24, 1012-1018.

Mischel, W. The interaction of person and situation. In

    Magnusson, D. and Endler, N. S. (Eds.), Personality at the

    crossroads: Current issues in interactionist psychology.

    New York: John Wiley and Sons, 1977.

Miyamoto, S. F. and Dornbusch, S. A test of the symbolic inter-

    actionist hypotheses of self-conception. American Journal

    of Sociology, 1956, 61, 399-403.

Mote, F. B. The relationship between child self-concept in

    school and parental attitudes and behaviors in child rearing.

    (Doctoral dissertation, Stanford University, 1966). Dis-

    sertation Abstracts International, 1967, 27, 3319A.

Nie, N. J., Hull, H. C., Jenkins, J. G., Steinbrenner, K., and

 Bent, D. H. SPSS Statistical Package for the Social

 Sciences. New York: McGraw-Hill, 1975.

Norman, W. T. and Goldberg, L. R. Raters, ratees, and randomness

 in personality structure. Journal of Personality and Social

 Psychology, 1966, 4, 681-691.

Nunnally, J. C. Psychometric theory (2nd ed.). New York: McGraw-

 Hill, 1978.

Orpen, C. and Bush, R. The lack of congruence between self-

 concept and public image. Journal of Social Psychology,

 1974, 93, 145-146.

Osgood, C. E. Ease of individual judgment-processes in relation

 to polarization of attitudes in the culture. Journal of

 Social Psychology, 1941, 14, 403-418.

Osgood, C. E. and Suci, G. J. A measure of relation determined

 by both mean differences and profile information. Psycho-

 logical Bulletin, 1952, 49, 251-262.

Osgood, C. E., Suci, G. J., and Tannenbaum, P. H. The measurement

 of meaning. Urbana, Ill.: University of Illinois Press,

 1957.

Peterson, D. R. Scope and generality of verbally defined per-

 sonality factors. Psychological Review, 1965, 72, 48-59.

Phillips, B. N. Age changes in accuracy of self-perception.

 Child Development, 1963, 64, 1041-1046.

Quarantelli, E. L. and Cooper, J. Self-conceptions and others:
A further test of the Meadian hypothesis. Sociological
Quarterly, 1966, 7, 281-297.

Ramseur, J. G. Interpersonal behavior measured and identified.
Unpublished Master's thesis, Texas Woman's University, 1968.

Rao, C. R. The utilization of multiple measurements in problems
of biological classification. Journal of the Royal Statisti-
cal Society, Ser. B, 1948, 10, 159-203.

Reeder, L. G., Donohue, G. A., and Biblarz, A. Conceptions of
self and others. American Journal of Sociology, 1960, 66,
153-159.

Revelle, W. and Rocklin, T. Very simple structure: An alternative
procedure for estimating the optimal number of interpretable
factors. Multivariate Behavioral Research, 1979, 14, 403-414.

Rokeach, M. Studies in beauty: II. Some determiners of the
perception of beauty in women. Journal of Social Psychology,
1945, 22, 155-169.

Rorer, L. G. The great response-style myth. Psychological
Bulletin, 1965, 63, 129-156.

Scheier, M. J., Buss, A. H., and Buss, D. M. Self-consciousness,
self-report of aggressiveness, and aggression. Journal of
Research in Personality, 1978, 12, 133-140.

Schneider, B. Relationship between various criteria of leader-
ship in small groups. Journal of Social Psychology, 1970, 82,
253-261.

Schoeneman, T. J. Reports of the sources of self-knowledge. Journal of Personality, 1981, 49, 284-294.

Schutz, W. The interpersonal world. Palo Alto, Cal.: Science and Behavior Books, Inc., 1966.

Scott, W. A. and Johnson, R. C. Comparative validity of direct and indirect personality tests. Journal of Consulting and Clinical Psychology, 1972, 38, 301-318.

Sherwood, J. J. Self-report and projective measures of achievement and affiliation. Journal of Consulting Psychology, 1966, 30, 329-337.

Shrauger, J. S. and Osberg, T. M. The relative accuracy of self-predictions and judgments by others in psychological assessment. Psychological Bulletin, 1981, 90, 322-351.

Shrauger, J. S. and Schoeneman, T. J. Symbolic interactionist view of self-concept: Through the looking glass darkly. Psychological Bulletin, 1979, 80, 549-573.

Stagner, R. Traits are relevant: Theoretical analysis and empirical evidence. In Endler, N. S. and Magnusson, D. (Eds.), Interactional psychology and personality. New York: John Wiley and Sons, 1976.

Stricker, L. J. "Test-wiseness" on personality scales. Journal of Applied Psychology, Monograph, 1969, 53(3, Pt. 2).

Thomas, J. W. Your personal growth. New York: Frederick Fell, Inc., 1971.

Thomas, J. W. Bi/Polar Inventory of Strengths. Richardson,
     Texas: Bi/Polar, Inc., 1977(a).

Thomas, J. W. Bi/Polar seminar. Richardson, Texas: Bi/Polar,
     Inc., 1977(b).

Thomas, J. W. Bi/Polar: A positive way of understanding people.
     Richardson, Texas: Bi/Polar, Inc., 1978.

Thomas, J. W. Bi/Polar team building program. Richardson, Texas:
     Bi/Polar, Inc., 1979.

Thorndike, E. L. A constant error in psychological ratings.
     Journal of Applied Psychology, 1920, 4, 25-29.

Todoroski, N. R. Self-acceptance and acceptance by peers.
     (Doctoral dissertation, Michigan State University, 1972).
     Dissertation Abstracts International, 1972, 33, 2359-2360B.

Tschechtelin, S. M. A. Self-appraisal of children. Journal of
     Educational Research, 1945, 39, 25-32.

Turner, R. G. and Peterson, M. Public and private self-
     consciousness and emotional expressivity. Journal of
     Consulting and Clinical Psychology, 1977, 45, 490-491.

Veldman, D. J. Simple structure and the number of factors
     problem. Multivariate Behavioral Research, 1974, 8, 191-200.

Veldman, D. J. The PRIME system. Computer programs for statis-
     tical analysis. Austin: R & D Center for Teacher Education,
     1978.

Webb, W. B. Self-evaluations, group evaluations, and objective
     measures. Journal of Consulting Psychology, 1955, 19, 210-
     212.

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

Winthrop, H. Self-images of personal adjustment vs. the estimates
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VITA

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