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The Clinical Appraisal Method of Evaluating Candidates for Management Positions: A Construct Validity Study

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THE CLINICAL APPRAISAL METHOD OF EVALUATING

CANDIDATES FOR MANAGEMENT POSITIONS:

A CONSTRUCT VALIDITY STUDY

by

Loretta Postillion van der Plas

A Dissertation Submitted to the Faculty of the Graduate School

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The author, Loretta Postillion van der Plas, is the daughter of the late Victor V. and Johanna C. (Todesco) Postillion. She was born in Oak Park, Illinois.

Her elementary education was obtained in several suburban area schools of Chicago, Illinois and in Tucson, Arizona. Her secondary education was completed in 1955 at Nazareth Academy, La Grange, Illinois. In 1959, she received the degree of Bachelor of Arts in philosophy and psychology from St. Mary's College, Notre Dame, Indiana.

After working for a time as a job analyst, Loretta van der Plas entered the graduate program in clinical psychology at Loyola University of Chicago where she earned a Master of Arts degree in January, 1966. During her graduate studies she completed a traineeship at Catholic Charities of Chicago, a clerkship in clinical psychology at the Loyola Guidance Center, an assistantship in the Loyola Psychometric Laboratory, and an APA approved doctoral internship in clinical psychology at Rush-Presbyterian-St. Luke's Hospital in Chicago.

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CHAPTER I

INTRODUCTION

A large number of psychologists serving as consultants to
industrial corporations apply a "clinical appraisal" or "clinical
assessment" approach to psychological evaluations of manager candidates
in order to recommend their suitability for hire (Grant, 1980).
However, few studies have been conducted in recent years to investigate
the validity of this approach. This may in part be attributable to the
disappointing findings of its predictive power from studies conducted
in the 1950's and 1960's. Furthermore, the adequacy of both experts
and the clinical method to make valid predictions has been seriously
questioned.

The current investigation was conducted to address the need for
research validating the use of clinical appraisal by psychologists in
charge of making recommendations about the suitability of candidates
for management positions. A construct validity design was selected for
this purpose, in part because of its value for advancing understanding
regarding the nature of the process. In addition, a construct valida-
tion design was considered to be the most feasible and superior
alternative to the methodically flawed criterion-related studies that
are typically possible for investigating the value of the clinical
appraisal approach to predicting management effectiveness.

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A more detailed discussion follows regarding the nature of the clinical appraisal process, the difficulties inherent in its valida- tion, and issues of relevance to validation studies conducted within the context of personnel selection. Finally, a general description of the current investigation, including the major assumptions which it attempts to address, will be presented.

Clinical Appraisal

Clinical appraisal is defined by Sundberg (1977) "as the set of processes used by a person or persons for developing impressions and images, making decisions and checking hypotheses about one person's pattern of characteristics which determines his or her behavior in interaction with the environment" (pp. 21-22). This definition empha- sizes the judgmental nature of this assessment approach. In the indus- trial research literature, however, clinical appraisal is frequently referred to as a multiple assessment procedure (e.g., Albrecht, Glaser, & Marks, 1964; Dunnette, 1971; Grant, 1980; Thornton & Byham, 1982) in that a variety of assessment techniques (viz., intensive interviews, tests, exercises, personal history data) are used to obtain input for making judgments about an assessee on a variety of psycho- logical individual difference variables. What has typically been the interest of these researchers is the validity of predictions made by the composite of multiple assessment procedures relative to those made by single components of the approach. Thus, they are more concerned with the predictive validity of the approach than with understanding its judgmental nature.

The Process of Evaluating Manager Candidates

Irrespective of the method of collecting data on a candidate, the process involves a search for relevant information on which to judge a candidate. This search is typically guided by having some conceptual model of the general dimensions of personality that should be assessed, along with an idea of the individual difference variables or "attributes" that comprise each dimension.

Psychologists may select one (singular) or, more typically, several (multiple) methods of assessment. Both the clinical appraisal and the assessment center approaches use multiple assessment techniques and combine information about managers judgmentally. For this reason they are frequently compared in the research literature evaluating management selection procedures. However, clinical assessment is distinguished from other multiple assessment techniques (e.g., assessment centers) in the number and kind of assessors involved in the assessment process, as well as in the types of assessment techniques relied upon. Whereas the clinical approach typically uses one assessor (a psychologist) and relies on an intensive interview, personal history data, and some variable amount of psychological testing, assessment centers usually use multiple assessors (both psychologists and managers) and rely, especially, on various situational tests and exercises in addition to the above mentioned assessment techniques in arriving at group judgments regarding a candidate.

The next step of the clinical appraisal process involves the formation of a number of specific judgments about the evaluee on a set of "relevant" variables. The determination of what is relevant

involves some conceptualization by psychologists as regards both the common requirements of all management jobs as well as the specific requirements of the position for which a candidate is being evaluated. This step in the model is typically the least explicit and frequently a major target of critics of the clinical appraisal approach to management evaluation (e.g., Thornton & Byham, 1982). Yet, psychologists employing this approach attest to the fact that their goal is to achieve a "match" between the psychological qualifications of candidates and the requirements or psychological demands of the jobs for which candidates are being evaluated (e.g., Rohrer, Hibler, & Replogle, 1981).

Although the next step in the process is usually not explicit, psychologists must somehow combine the entire set of judgments about a candidate in order to arrive at some overall decision. The weighting given to individual judgments about the candidate is typically referred to as the psychologist's decision strategy. If psychologists only consider the requirements common to all management jobs when making their recommendation decisions, then one general decision strategy must be operative no matter what type of job the evaluee is being considered for. However, if psychologists alter their decision strategy because of different job demands, then one would expect different decision strategies to be evident for different homogeneous groupings of managerial work.

The resultant of these judgments and decision strategies is typically that some decision is made about the evaluee. While the final decision regarding a candidate also constitutes a judgment task,

it assumes more of the characteristics of decision-making when, as Bieri and his associates note (Bieri et al, 1966), the assignment of a stimulus (e.g., the candidate) to a category (e.g., recommend or not recommend) involves a consideration of the value, preference, or outcome of each response alternative (e.g., probable success or failure on the job). The decision may thus be conceptualized as reflecting the psychologist's prediction about an individual. In the case of consulting psychologists, these are typically dichotomous hire/not hire recommendations, although it is possible that the decision consists of a rating on some continuous dimension (e.g., degree of suitability for the position or probability of success on the job).

The lack of research on the clinical appraisal process has left unanswered a number of questions pertaining to its different aspects. For example, what individual difference characteristics are the focus of psychologists' judgments about management candidates? Also, what conceptual framework is empirically used by psychologists to guide their evaluation of candidates? Does this conceptual framework actually account for their final recommendations about candidates? One may also question how their judgments on various dimensions of a candidate's personality are weighted in order to arrive at a decision to recommend candidates for management jobs. Finally, one may ask whether differing job requirements lead psychologists to adopt differing decision strategies.

Reasons for the Lack of Clinical Appraisal Research

A number of reasons may be enumerated to account for the lack of research which has attempted to understand and evaluate the clinical

appraisal approach as a total assessment procedure or "test." Some of these reasons relate to the technical difficulties and problems frequently encountered when conducting managerial selection validation research, especially of a predictive design. Other reasons pertain to the complexity of the clinical judgment process and the difficulties inherent in defining and investigating its various components.

Technical difficulties. Several technical problems have hampered clinical assessment research. First, the positions for which candidates are being evaluated are usually unique higher level jobs in very disparate corporate settings. This increases the number of situational variables that may affect predictive criterion outcomes and also decreases the possibility of obtaining comparable samples for analysis. Second, defining and measuring a criterion of effectiveness for adequate size samples of higher level managers is typically beset with problems. Third, psychologists acting as outside consultants typically deal with a very restricted range of candidates who have previously been screened by referring companies, thereby leading to the likelihood of obtaining attenuated validity coefficients. Fourth, because psychologist consultants frequently use their initial assess-ment of a selected candidate as the basis of a continuing consultative relationship with the manager after being hired, the possibility of criterion contamination usually precludes the use of predictive models to assess the validity of their recommendations. At the same time, criterion range restriction typically occurs because subsequent performance evaluation is usually not possible with candidates who are not recommended. Fifth, insofar as the specific assessment procedures

used by different psychologists or consulting firms vary considerably (Koten, 1978), the lack of standardization of the approach limits the generalizability of findings from the few studies that do exist. Also, the probability of obtaining adequate size samples for analysis is limited by the variability amongst clinicians employing the approach.

The complexity of the clinical judgment process. As indicated earlier, clinical judgment is exercised by psychologists in a number of ways when assessing candidates for a determination of their suitability for management jobs. Psychologists must select the appropriate procedures for eliciting information from candidates which will provide the basis of their judgments. They must also determine the relevant characteristics of the candidate which should be assessed. From the description they receive of the vacant job's functions and the needs of the client organization, they must determine the psychological characteristics most critical for effective performance in the job. Finally, these separate judgments regarding the candidate and the job's demands must somehow be combined in order to arrive at an overall judgment, or "decision," regarding whether or not to recommend the candidate. In arriving at this decision, various characteristics of the candidate may be given more or less importance by the psychologist depending on their perceived relevance to the job in question. Because of the overall complexity of the clinical approach, it is a difficult task to examine its validity in a manner which preserves the differentiation of these steps, while at the same time maintaining the integrity of the entire process.

Validity Issues and Employee Selection Procedures

Since passage of the Civil Rights Act of 1964 (1972), governmental regulations have increasingly pointed to the need to demonstrate the validity of any procedure used to select employees. After passage of the act, the newly established Equal Employment Opportunity Commissions (EEOC) and other federal agencies (viz., Civil Service Commission, Department of Labor, and Department of Justice) were given responsibility to insure that employee selection procedures were not discriminatory by reason of race, color, religion, sex or national origin. Despite difficulty in reaching agreement, these varied governing bodies in 1978 adopted the Uniform Guidelines on Employee Selection Procedures (EEOC et al, 1978). Although in accord that tests used for selection must be validated, the various agencies had earlier differed on the legal and technical standards for judging the proper use of tests. Also, the word "test" came to be used in its broadest sense so as to include any procedure, such as an interview, used to evaluate employees for selection purposes.

In the American Psychological Association (APA) Standards, validity is defined as "the appropriateness of inferences from test scores or other forms of assessment" (APA et al, 1974, p. 25). However, as Dunnette and Borman (1979) point out, in this version of the Standards (APA et al, 1974), as in that of its predecessors (APA, 1954; APA, AERA, & NCME, 1966), validity continued to be compartmentalized into seemingly distinct "types" (namely, criterion-related, content, and construct). Dunnette and Borman (1979) noted that this

segmentation appeared in the 1978 publication of the <u>Uniform Guidelines</u> (EEOC et al, 1978) in an exaggerated and particularly mechanical form.

More recently, the type approach to validation is giving way to a more unified emphasis (see e.g., <u>The Principles for Validation and Use of Personnel Selection Procedures</u>, APA Division of Industrial and Organizational Psychology, 1980). Increasingly, the focus in <u>The Principles</u> and in the industrial/organizational literature is on the role of the validation process as one of developing and evaluating rational hypotheses about the meanings of tests or other assessment measures (see e.g, Campbell, 1976; Guion, 1976, 1980; Messick, 1975, 1980).

In pointing out that the unified notion of validity is much more closely related to the notion of construct validity than either criterion-related or content validity, Guion (1980) also raised the question whether the latter two facets of the validation process consistently serve as evidence of validity. He further cautioned that one should not confuse an evaluative interpretation of validity with an obtained validity coefficient. In fact, he reiterated (Guion, 1976, 1980) that in personnel selection better evidence of validity may come from a tightly reasoned hypothesis than may come from a criterion-related coefficient. Thus, in cases where it is not technically feasible to conduct a criterion-related study, a construct validity design, with well developed hypotheses to be tested, may not only be an adequate, but even a superior substitute to demonstrating the value of a procedure.

Construct Validity and Job Relevance

For a construct validity design to have value within the personnel selection context, both the constructs measured by an assessment procedure and the job factors to which they are to be linked must be clearly defined. In an unpublished draft of the Joint Technical Standards (JTS) presented at the 1982 convention business meeting of Division 14 (Industrial and Organizational Psychology), it was stated that a construct validation process must establish two important links. There must first be evidence for the validity of the "test" as a measure of the construct, and second, there must be evidence for the validity of the construct as a determinant of major factors of job performance (section 9.2, JTS unpublished draft, 1982). Furthermore, it was stated that a clear conceptual rationale must postulate the nature of these two links. Guion (1980) suggested that it would be an error to assume that job relatedness can only be evaluated in terms of a validity coefficient describing an observed relationship. He further stated that "the solid logic of a well developed hypothesis, where competent empirical research is unlikely, provides better evidence of the job relatedness of a predictor than does a validity coefficient obtained in a faulty study" (Guion, 1980, p.397).

The Present Investigation

In the current investigation, a construct validity model was applied in order to evaluate the clinical appraisal method used by a group of psychologists in charge of recommending candidates for management jobs. To demonstrate the construct validity of the method several theoretical assumptions were postulated. First, the set of

personality characteristics that are empirically used by psychologists in their assessments of candidates should account statistically for a major proportion of the variance in their hiring recommendations. An important corollary of this premise is that psychologists' hiring recommendations should <u>not</u> be contingent on (i.e., related to) such characteristics of candidates as their gender, age, or ethnic background. Also, the proportion of candidates recommended for different types of jobs should remain relatively stable across job categories. In order to examine these assumptions, a linear regression model of psychologists' recommendation decisions was used. The history and adequacy of such mathematical models of the clinical inference process and their use in capturing the decision policies of judges will be reviewed in the next chapter.

Second, the empirically derived dimensional structure (viz., through factor analysis) of the personality characteristics used to appraise manager candidates should bear similarity to the dimensional structure of the predictors of managerial effectiveness obtained by other researchers. Therefore, a number of studies on the dimensions of personality predictive of success in management will be reviewed in the next chapter.

Because the conceptual framework which psychologists use a priori to organize their judgments about candidate characteristics is typically based on rather broad dimensional considerations, it is expected that an empirically derived structure will be both more complex and better able to capture the variance in their judgments of candidate suitability. Thus, the current investigation aims to address

such a comparison of dimensional structures in accounting for the variance in psychologists' hiring recommendations.

Finally, the validation of any measure used to select personnel should also show that there is a link between job demands and the personality characteristics required to meet those demands. One way to do this within the context of a construct validation procedure is to demonstrate that the weights psychologists give to different dimensions of personality when making their recommendations about candidates change as a function of the types of jobs for which the candidates were appraised. Thus, if psychologists indeed take into account differing job demands when recommending candidates, psychologists' knowledge of candidates' memberships in categories of jobs with differing require-ments should have a moderating effect on the weights given factor based dimensions of personality in models of the psychologists' recommend-ation policies. Stated differently, including information about the jobs for which candidates were assessed in the model of the psycholo-gists' recommendation decisions should lead to significantly greater predictability of their recommendations than would information regard-ing personality dimensions alone. The analytic strategy used to test this hypothesis (viz., hierarchical regression analysis of sets and the analysis of a set of interaction effects) will be discussed in greater detail in the chapter entitled "Method" presented later.

In order to examine the moderating effects of job information, candidates were categorized along several dimensions of management jobs which the research literature has demonstrated to differ in job demands. The dimensions along which management jobs have been found to

differ which were used in this study include their supervisory requirements, their level in the organization hierarchy, and their functional specializations. These job dimensions, as well as the personality characteristics found to be differentially predictive of effective performance along these dimensions, will be reviewed in greater detail in the next chapter.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Models of Assessment Research

McReynolds (1971) has described two major conceptual models of assessment: the attribute model and the decision model.   Studies investigating the clinical appraisal approach to selection have typically adopted one or the other of these models.   The classic and conventional approach to assessment is termed the "attribute model." Research using this model "focuses on prediction to a criterion of the attribute" (McReynolds, 1971, pp. 5-6).   The other major approach to conceptualizing psychological assessment is the "decision model." Whereas the attribute model focuses on validity, the decision model is more often concerned with issues of utility and focuses on the strategies clinicians use to arrive at useful outcomes (see Cronbach & Gleser, 1965, pp. 133-149 for the systematic development of this model).   In studies of clinical appraisal applied to industrial selection, either the predictive validity of attributes assessed by psychologists or the strategies of the decision making process has been emphasized.   A discussion of these two sets of literature follows.

Predictive Validity of the Clinical Approach

A number of studies were conducted in the 1950s and 1960s to investigate the validity of predictions made by psychologists using the

clinical appraisal approach (e.g., Albrecht, Glaser, & Marks, 1964; Campbell, 1962; Campbell, Otis, Liske, & Prien, 1962; De Nelsky & McKee, 1969; Dicken & Black, 1965; Gordon, 1967; Hilton, Bolin, Parker, Taylor, & Walker, 1955; Huse, 1962; Kelly & Fiske, 1951; Otis, Campbell, & Prien, 1962; Prien, 1962; Prien & Liske, 1962; Stern, Stein, & Bloom, 1956; Trankell, 1959). Most of these studies reported findings of low to moderate predictive validities. However, Trankell (1959) found clinical prediction to be superior to test prediction alone. He demonstrated that a clinically oriented multiple assessment approach used by psychologists to select airline pilots resulted in higher validity coefficients than standardized tests alone (e.g., $\underline{r}$ = .55 for clinical assessment versus $\underline{r}$ = .42 for test assessment of the variable "simultaneous capacity"; also, median $\underline{r}$ = .32 for clinical and median $\underline{r}$ = .28 for test assessment). On the other hand, findings of low but statistically significant (median $\underline{r}$ = .28) predictive validity were obtained by Hilton and his associates (Hilton et al, 1955) in their study evaluating the clinical appraisal method used in assessing men during 1951 and 1952 in the Personal Audit Program of the Personnel Research Institute.

A series of studies were conducted at Western Reserve University to investigate the validity of both the total clinical assessment approach as well as the validity of its various components (Campbell, 1962; Campbell et al, 1962; Prien, 1962; Prien et al, 1962). Based on interview and test data, ratings of candidates for managerial jobs were made by a psychologist on eight scales (sociability, persuasiveness, supervisory ability, ability to handle complex problems, originality,

planning, drive, and overall effectiveness). Correlations of ratings from the total multiple assessment procedure with ratings made by first and second line supervisors ranged from .05 to .46 (Campbell et al, 1962).

Albrecht, Glaser, and Marks (1964) correlated a combined criterion (based on the combined ratings of immediate supervisors, peers, and rankings by general regional managers) with psychologists' ratings of 31 district marketing managers on four performance variables (forecasting and budgeting effectiveness; sales performance; effectiveness in interpersonal relations; and overall effectiveness). With the composite criterion, validity coefficients improved to moderately high and significant levels (.49, .58, .43, and .46 on the four above named variables). In contrast, absolute ratings made by immediate supervisors correlated with psychologists' ratings only .07, .23, .19, and .09 on the four variables. This discrepancy in validity coefficients highlights the importance of obtaining reliable and valid criterion measurements in order to obtain findings of high validity for the clinical appraisal method. As discussed elsewhere in this presentation, this is frequently not technically feasible.

In contrast to studies demonstrating low to moderate predictive validity of the clinical appraisal approach, a series of five studies reported by Miner (1970) failed to find a significant relationship between psychologists' recommendations for hiring and a variety of success criteria (e.g., tenure, compensation increase, supervisor ratings, and level in organization). Thus, evidence regarding the predictive validity of this procedure has been quite mixed.

The Clinical-Statistical Controversy

The lack of strong evidence to support clinical appraisal as a predictive approach led researchers to examine various explanations for the findings. On the basis of reviews of the literature on prediction, some researchers (e.g., Meehl, 1954, 1965; Sawyer, 1966) suggested that the clinical combination of data to arrive at decisions was more subject to error and less efficient than an actuarial or statistical method of combining information and that the latter approach should be used wherever possible. The usefulness of the clinical approach was perceived to be limited to the data gathering function.

In Meehl's (1965) review only one study (Lindzey, 1965) was found to favor clinical prediction, yet even this study was later seriously questioned (e.g., Wiggins, 1973). Sawyer (1966), in his review of research studies comparing the merits of clinical versus actuarial (i.e., psychometric) prediction, contributed to an understanding of the issues involved by discussing the gathering and combining of data as separate steps. He further indicated that either or both of these processes could be clinical or actuarial. A number of researchers have subsequently concluded that whereas the clinician may make a valuable contribution in the data gathering phase, mechanical combination of data should be done wherever possible when making predictions.

Not all researchers have reached the same conclusions. McReynolds (1968) raised the question whether the clinical approach had been adequately represented in the studies previously reviewed. Korman (1968), after reviewing both judgmental and psychometric methods of

predicting managerial performance, came to a conclusion in favor of clinical prediction. Holt (1970) cited a number of methodological problems in earlier studies of clinical prediction, in addition to criticizing the reviews concluding in favor of statistical prediction. More recently, Epstein (1983) has also suggested that much of the existing validation literature might be underestimating actual predictor-criterion relationships.

Because of its specific relevance to the prediction of managerial effectiveness, Korman's (1968) review will be discussed in somewhat greater detail. After comparing a group of studies investigating the actuarial predictability of each of such measures as ability tests, objective personality inventories, projective tests, and personal history data to another group of studies employing a judgmental prediction model (i.e., one that interpretively and judgmentally combines data from several sources), Korman (1968) concluded that the judgmental model could do as well or better than the actuarial approach. He found this to be true despite the small samples typically reported in the judgmental prediction studies, as well as the general paucity of research overall. He suggested that one reason for the possible superiority of the clinical prediction of managerial effectiveness may be the consequence of the restricted range of characteristics (cognitive ability, in particular) to be found in a management sample. He further suggested that the changing and factorially complex nature of criteria used in management prediction studies (e.g., performance ratings, level changes, salary, etc.) makes psychometric prediction problematic. He described the situation as one of the unknown (i.e.,

the predictor variables) predicting the unknown (i.e., the subsequent performance variables).

According to Korman (1968), the judge (clinician) in judgmental prediction may be implicitly incorporating an evaluation of an individual's adaptability to change, and subsequently to changing standards of effectiveness criteria, as aspects of the behavior that is being predicted. In his conclusion, Korman (1968) suggested that future research be directed at bringing about a greater understanding of the nature of the personal variables related to leadership behavior, the kinds of behaviors they are related to, and the situational influences which affect these relationships.

One of the most articulate defenses of clinical judgment approaches was made by Holt (1970). Holt delineated a number of points at which clinical judgment may enter the predictive process. These include the steps of analyzing and selecting criteria to be predicted, discovering situational and intrapersonal intervening variables that need to be measured in order to predict the criteria, selecting appropriate assessment instruments, pilot testing of predictor variables, and finally, applying what has been learned in the preceding steps in a cross-validation study. The last step is twofold, involving first the rendering of data in a manner that is amenable to statistical treatment and then combining these scores (or ratings, etc.) in order to arrive at a final prediction. Holt (1970) noted that only this last aspect (i.e., the combining of scores) had been of interest to those researchers interested in the statistical-clinical controversy. He further suggested that, while a fair comparison of the two approaches

should hold all prior steps constant, none of the studies cited by critics of the clinical prediction approach had done this. He also insisted that the majority of studies cited by Sawyer (1966) as evidence for the limitations of clinical prediction methods were flawed. Holt (1970) included among these flaws such things as criterion contamination of un-crossvalidated formulas, inadequate criterion measures, misleading classification of judges as "clinicians," insufficient power to detect differences, and use of quantitative data only.

As an example of the overreliance on quantitative data by critics of the clinical prediction method, profiles from the MMPI (Minnesota Multiphasic Personality Inventory) were the primary source of data in a number of studies (e.g., Hoffman, 1960; Kleinmuntz, 1967; Meehl, 1954) and in six of the 45 studies cited by Sawyer (1966). Yet, a study by Sines (1959) found that the addition of interview data to MMPI data considerably improved clinical predictions. Comparing sources of input data for predictive judgments, average validity coefficients were 0.595 for 10 psychologists with access to a biographical data sheet, interview data, plus the MMPI, whereas omission of interview data resulted in an average validity coefficient of only 0.378.

The technical difficulties in conducting studies of the predictive validity of the clinical appraisal approach continue to be a problem. Recently, some researchers (e.g., Sackett & Wade, 1983; Schmidt, Hunter, & Urry, 1976) have presented statistical evidence to show the sizable samples which are required to detect true criterion-

related validity for different levels of range restriction of predictor variables and for different levels of criterion reliability. Based on this evidence, one might conclude that earlier research on the predictive validity of clinical approaches rarely had samples of adequate size to detect significant relationships. Because managers are already a preselected group at the time of assessment, and further, because only hired managers can typically be examined for subsequent criterion performance, range restriction of predictor and criterion variables is considerable. As noted by a number of researchers (e.g., Borman, 1978; Holt, 1970; Jackson & Paunonen, 1980), there are serious difficulties inherent in obtaining criterion reliability.

Recently, Schmidt and his associates (Schmidt, Hunter, Croll, & McKensie, 1983) compared the expert judgments of the validity of a set of predictor measures by a group of personnel psychologists to the known validity of these measures based on large sample ($\underline{n}$ = 3,258 to 14,723) military studies of criterion-related validity. They found that the sample size of a criterion-related validation study for one job title would have to be 92 in order to equal the accuracy of a single judge in estimating the validity of a predictor measure. In view of the finding that the typical validation study had a sample size of 68 (Lent, Aurbach, & Levin, 1971), Schmidt and his colleagues (Schmidt et al, 1983) concluded that expert judgments can contain substantially more information than that yielded by most local criterion-related studies. In view of the difficulties inherent in obtaining criterion reliability, this issue of statistical power raises

considerable doubt as to whether clinical prediction has yet been adequately investigated.

Thornton and Byham (1982) also noted that the statistical-clinical controversy may not yet be resolved. Owing to the fact that, even in corporate management assessment centers (where somewhat higher coefficients of predictive validity have been obtained), it is seldom possible to empirically derive reliable cross-validated weights because of small samples, unreliable criteria, heterogeneous collections of jobs, or unstable job environments, they concluded that the clinical combination of data was still the preferred mode of making predictions of managerial effectiveness.

Jackson and Paunonen (1980) have also pointed to conceptual and methodological inadequacies of the research literature cited as supporting evidence of the inadequacy of human judges to gauge personality. More specifically, they discussed difficulties inherent not only in obtaining stable criterion measures but also in obtaining stable predictor measures as well. They suggested that raters, as well as other measuring instruments, operate as distorting lenses introducing systematic method variance and imposing practical limits on the validity coefficient. As supporting evidence they cited a study by Borman (1978) who, despite having contrived a nearly ideal situation for rating job performance, found that validity coefficients were limited by lack of interrater agreement and by the differing personal constructs raters had regarding job relevant behavior. In their concluding remarks, Jackson and Paunonen (1980) suggested that "personality psychology, like applied psychology, has suffered from simplistic

preoccupations with criterion validity to the exclusion of the processes contributing to and restricting such validity" (p. 543).   To redress this imbalance they called attention to the value of multivariate approaches which take account of a variety of sources of variance, to investigations of the components of criterion performance, as well as to experimental studies of process.

Whereas some researchers have focused on the methodological and technical problems of validating clinical prediction, a number of other researchers in the area of person perception (e.g., Bourne, 1977; Fiske, 1978; Mischel, 1968, 1973; Schneider, 1973; Schneider, Hastorf, & Ellsworth, 1979) have questioned the utility of the human judge to accurately gauge personality at all.   For example, Schweder (1982) suggested that trait conceptions represent systematic distortions based on conceptual and semantic notions of "what goes with what" rather than actual behavioral co-occurrences.   Also, Mischel's (1968) argument that traits are primarily constructs of the observer rather than attributes of the observed, has led to considerable research interest focused on the situational determinants of behavior (e.g., Sarason, Smith, & Diener, 1975).   More recently, Mischel and Peake (1982) have criticized trait approaches to predicting behavior by pointing to their lack of cross-situational consistency.

The controversy regarding the relative contributions of situational and cognitive factors in judgment and prediction has certainly not been resolved.   However, efforts to model the clinical inference process may help in our understanding of clinical judgment and pre-

diction. Thus, mathematical modeling of the clinical judgment process will be briefly reviewed in the next section.

Models of Clinical Inference

Applying Brunswik's (1955, 1956) lens model conceptualization to the subject of clinical prediction, Hammond and his associates (Hammond, 1955, 1966; Hammond, Hursch, & Todd, 1964; Hursch, Hammond, & Hursch, 1964) suggested that the relationships among predictions, cues (input data or predictor variables), and criteria may be specified by means of correlational analysis. Not only was it found that simple linear regression models of cue utilization could be used to predict criterion variables, but they could be used to predict clinical judgments, as well (Hoffman, 1960). Recognizing that such models could not be assumed to conclusively exemplify the cognitive processes they are supposed to represent, Hoffman (1960) termed such models "paramorphic representations" of clinical inference and merely first approximations to the description of clinical judgment.

Subsequent research has substantially demonstrated the adequacy of linear models for capturing the policies of judges (e.g., Anderson, 1968; Dudycha & Naylor, 1966; Goldberg, 1968; Hammond et al, 1964; Hursch et al, 1964; Slovic, 1969; Wiggins & Hoffman, 1968) even when judges were utilizing cues in a configural rather than an additive manner (for reviews see e.g., Dawes & Corrigan, 1974; Slovic, Fischhoff, & Lichtenstein, 1977; Slovic & Lichtenstein, 1971; Wiggins, 1973). Moreover, models of judges' policies have been demonstrated to be equal to or more accurate in predicting criteria than the judges' own predictions. This bootstrapping effect has been thought to occur

because of the ability of the linear model to capture the essence of the judge's expertise while eliminating the judge's unreliability (Dawes, 1971; Dawes et al, 1974; Goldberg, 1970). More recently, however, Dawes (1979) has suggested that, in cases where there is a measurable criterion, random linear models (including those with equal weighting of the predictor variables) can be superior to bootstrapping models. As Dawes and Corrigan (1974, p. 105) concluded, "the whole trick is to know what variables to look at and then know how to add." However, in the absence of either reliable criterion measures or certainty regarding the variables to look at, a need exists to better understand psychologists' decision policies before one can seriously consider the possibility of replacing them with either their own or random models.

Recent Focus of the Personnel Selection Literature

Instead of subsequent research on the clinical appraisal method being directed at specifically addressing and correcting those method-ological problems serving to attenuate validity coefficients (e.g., criterion definition and measurement), research interest since the late 1960s has focused on another multiple assessment technique; namely, the assessment center approach to management evaluation (for reviews see e.g., Bray, Campbell, & Grant, 1974; Finkle, 1976; Huck, 1977; Moses & Byham, 1977; Thornton & Byham, 1982). Another major area of research interest is the selection interview (for recent reviews of this literature see, e.g., Arvey & Campion, 1982; Schmitt, 1976). Recent general reviews of the personnel selection literature have been provided by Dunnette and Borman (1979) and by Tenopyr and Oeltjen

(1982). Because of the similarity of the assessment center approach to the clinical appraisal method, and also because the interview is the major assessment component of the clinical approach, some findings from these two research areas which have relevance to this investigation will be discussed next.

The Assessment Center

By comparison with the clinical appraisal approach, studies of the assessment center method typically report relatively high predictive validity coefficients with success criteria. However, some controversy has surfaced in the literature regarding the meaning of such findings. Despite the high predictive validity of the assessment center approach, recent studies of the method suggest that assessment center ratings do not measure the intended constructs (Sackett & Dreher, 1982) and may simply be capturing the overall rater halo error of managers (Klimoski & Strickland, 1977). Such halo errors may occur in ratings of separate dimensions of behavior when the rater's overall impression of the assessee or the rater's impression of the assessee on one dimension deemed to be of particular importance then dominates all other ratings irrespective of veridicality. It was suggested by Klimoski and Strickland (1977) that the assessment center approach may yield such high validities as a result of capturing the rater halo of managers who are typically used as judges in the initial evaluations made of candidates rather than as a result of employing predictive dimensions which can be demonstrated to have construct validity. Since the criteria typically used to investigate the predictive validity of selection recommendations (e.g., performance appraisal, salary pro-

gress, or hierarchical level in the organization reached), are of a nature which also captures manager rater halo, a spuriously high correlation between the two measures may occur without any construct relevance of the initial predictors to the dimensions of behavior thought or intended to be measured. This points to the need for continued research that will serve to clarify the dimensions of personality that are most predictive of subsequent management performance.

The Interview

The selection interview as a decision making process has recently been the focus of a number of investigations (for recent reviews see e.g., Arvey & Campion, 1982; Schmitt, 1976). Insofar as the interview is a major component of the clinical assessment approach, some of the major findings from this research will be presented. Although most investigations of the interview as an assessment technique have either involved non-psychologist personnel interviewers in corporate settings or have used non-professionals (i.e., mainly students) as interviewers in simulated laboratory settings, some studies (e.g., Grant and Bray, 1969) have specifically evaluated the psychologist conducted interview.

Validity and reliability. In general, as with the research on the clinical appraisal approach, findings regarding the predictive validity of the interview have been disappointing (for major reviews of this research see e.g., Arvey & Campion,1982; Dunnette & Borman, 1979; Mayfield, 1964; Schmitt, 1976; Tenopyr & Oeltjen, 1982; Ulrich & Trumbo, 1965; Webster, 1964; Wright, 1969). These reviews suggest that

predictive validity findings are typically in the moderate range. This is so despite suggestions of relatively good inter-interviewer agreement (reliability coefficients typically range from 0.62 to 0.90). Structured interviews (viz., those conducted with some sort of guide or specified rating dimensions) have the highest reliability (Schwab & Heneman, 1969; Carlson, Schwab & Heneman, 1970) and validity. Nonetheless, validity coefficients are most typically reported to fall around 0.30 to 0.40. However, investigations of the validity of the interview suffer from methodological problems (e.g., low statistical power, unreliable and invalid criterion measures) similar to those previously discussed in regard to the clinical appraisal research literature.

The scope of the interview. A number of researchers have advocated limiting the scope of the interview to improve its validity (Rundquist, 1947; Ulrich & Trumbo, 1965, Wagner, 1949). Ulrich and Trumbo (1965) concluded that the two assessment variables which both heavily contribute to interviewer decisions and show greatest evidence of validity are personal relations and motivation to work. However, Grant and Bray (1969) found that 18 personality traits could be reliably coded from psychologists' interview reports and that they were relatively independent variables (see the section below on predictors of managerial effectiveness for a more complete discussion of this study). Howell and Vincent (1970), in a factor analysis of interview data, identified 10 factors which could be discriminated by interviewers. If interviewers are indeed limited in the number of assessment dimensions they can discriminate, it becomes especially important

to conduct more research aimed at clarifying both their nature and number.

Interviewer stereotypes. Based on studies of the interview conducted at McGill University, Webster (1964) concluded that interviewers make hiring decisions by matching and comparing job applicants against a stereotype of an ideal applicant. Subsequently, a number of researchers (e.g., Hakel, 1971; Hakel, Hollman & Dunnette, 1970; London & Hakel, 1974; Mayfield & Carlson, 1966; Rowe, 1963; Sydiaha, 1959, 1962) have been interested in determining what this stereotype may represent and what may modify its effect. The evidence suggests that interviewers do seem to have a common stereotype of an ideal applicant, although this generalized applicant may be the effect of rater halo (Hakel & Dunnette, 1970). Yet, when job information is provided interviewers, there is evidence to suggest that it is used to reduce the effect that irrelevant information about applicants may have on their decision making (Langdale & Weitz, 1973; Wiener & Schneiderman, 1974). Thus, job information may alter the stereotype of an "ideal applicant" so as to more closely fit job requirements. Further, Osburn, Timmreck and Bigby (1981) found that, as compared to the use of general rating dimensions, the use of rating dimensions specifically geared to the job description led to more accurate discriminations between more and less qualified applicants and also resulted in greater interviewer agreement. The critical question may therefore be, not whether the interviewer is operating in terms of a stereotype of an ideal applicant, but the degree to which this stereotype is modifiable by job information and is in conformity with job requirements.

Person perception research and the interview. The issue regarding the presence or modifiability of interviewer stereotypes is one example of the dovetailing of interests between industrial psychologists and those theorists and researchers whose general area of concern is the process of person perception. Dunnette and Borman (1979) suggested that insofar as it is the interviewer's job to develop accurate perceptions of applicants and to evaluate those perceptions in the light of job requirements, researchers investigating the interview should attend to the person perception literature as an aid to developing hypotheses and understanding the results of studies.

Applications of a theoretical model of person perception to the interview process may be found in two studies conducted by Jackson and his associates (Jackson, Peacock, & Smith, 1980; Rothstein & Jackson, 1980). Jackson (1972) proposed a model of "inferential accuracy" to describe the processes by which the network of implicative trait relationships may be employed to form accurate impressions of other people. Employing this model of social perception to study the process by which interviewers form an impression of a job applicant that may lead them to make a particular hiring decision, Rothstein and Jackson (1980) found that judges were differentially able to evaluate the characteristics of two contrived job applicants and that group consensus was a good way to optimize the accuracy of the judgments. The group consensus judgments attributed a pattern of associated behaviors to the applicants that accurately reflected the known characteristics of the applicants, as well as the empirical covariation of these behaviors obtained from an earlier factor analytic study of self-report

measures which was conducted by Seiss and Jackson (1970). Rothstein and Jackson (1980) also found that judgments of hiring suitability accurately reflected job criterion information as presented to the judges. However, the fact that judges were in part able to also use only a job label to identify a suitable applicant suggested to Rothstein and Jackson (1980) that there were perceived inferential links between behaviors related to occupations and general personality constructs. They suggested that the extent, use, and validity of such links as implicit criteria in the employment interview warrant further investigation. The judges in this study were undergraduate students. It would certainly be of value to investigate the use of such criteria amongst professional judges of personality for selection purposes.

In a series of three experiments, Jackson, Peacock, and Smith (1980) found that across both professional employment interviewers and university student interviewers approximately two thirds of the variance in judgments of job suitability was differentially attributable to the relevance or congruence of personality information provided by the candidate to the job. As in the Rothstein and Jackson(1980) study, relevance was determined from the intercorrelations of empirically-based occupational interest scales and personality scales (Siess & Jackson, 1970). Thus, Jackson and his associates (1980) concluded that these findings support the idea that there are stable implicit conceptions of personality (Bruner & Tagiuri, 1954; Lay & Jackson, 1969) that have reference to the world of work. While acknowledging that in the absence of criterion performance data one may not necessarily conclude that interviewers were making

differential judgments validly, Jackson and Paunonen (1980) suggested that the link between interview judgments and empirical data (Siess & Jackson, 1970) might raise some doubt that these judgments were wholly dependent on stereotypes and had no basis in reality.

In order to develop more specific hypotheses regarding the constructs likely to be emphasized by psychologists in their decisions to recommend candidates for management jobs, as well as to identify those constructs likely to take on differential importance for jobs with differing job demands, two interrelated and substantive areas of the management research literature will next be presented. Recognizing a certain amount of unavoidable overlap, this review will be directed at covering two major topic areas. First, research having a bearing on the nature of the predictor variables found to differentiate effective from ineffective managers will be presented. Following this, research regarding the nature of managerial work will be examined.

Predictors of Overall Managerial Effectiveness

One way that models of the clinical inference process can be especially useful is in the identification of variables that account for the variance in clinician's decisions. Once these variables are identified, they may then be the focus of several other kinds of investigation. For example, subsequent research may then examine their predictive power or the variables may be compared with those obtained in other studies of managerial effectiveness.

Most of the research literature pertaining to the specification of predictor variables starts with a number of characteristics of managers defined on an a priori basis which are subsequently correlated

with a variety of success criteria. These correlations between predictors and criteria have been examined for either heterogeneous groups of managers or for specific homogeneous management groups. A review of these studies suggests there are a number of variables that are common denominators of the requirements of managerial work in that they consistently appear in studies of a variety of management groups. However, because of semantic variations, and perhaps also because of differences in the types of managers studied, differences in predictor variables do occur. In this section an attempt will be made to both review significant research efforts to identify predictors of management success and also to attempt an integration of these findings.

Leader Traits

Stogdill (see Bass, 1981) summarized 52 factor analytic studies of leadership and management effectiveness conducted between 1945 and 1970. Twenty-six factors which appeared in at least three of these 52 studies were identified by Stogdill. These are shown in Table 1 along with their frequency of occurrence. The factors represent various descriptor categories: leader skills and capabilities, behaviors relevant to group relationships, and finally, personal characteristics.

As pointed out by Bass (1981), the factors that emerged from Stogdill's summary depended to a large degree on item mix, numbers of items in different categories, and on the nature of the populations described in the studies he surveyed. The studies included analyses of work behavior, situational exercises, supervisory and peer ratings, a variety of psychological tests, and self-ratings. The managers and other groups serving as subjects in these studies varied considerably,

Table 1

Stogdill's Summary of Managerial and Leader Trait Factors

Appearing in Three or More of 52 Studies Between 1945 and 1970

Factor	Factor Name	Frequency
1	Social and interpersonal skills	16
2	Technical skills	18
3	Administrative skills	12
4	Leadership effectiveness & achievement	15
5	Social nearness, friendliness	18
6	Intellectual skills	11
7	Maintaining cohesive group work	9
8	Maintaining coordination & teamwork	7
9	Task motivation & application	17
10	General impression (halo)	12
11	Group task supportiveness	17
12	Maintaining standards of performance	5
13	Willingness to assume responsibility	10
14	Emotional balance and control	15
15	Informal group control	4
16	Nurturant behavior	4
17	Ethical conduct, personal integrity	10
18	Communication, verbality	6
19	Ascendance, dominance, decisiveness	11
20	Physical energy	6
21	Experience and activity	4
22	Mature, cultured	3
23	Courage, daring	4
24	Aloof, distant	3
25	Creative, independent	5
26	Conforming	5

Source: Adapted from Bass (1981, p. 90).

including such diverse samples as enlisted Navy personnel (e.g., Bare, 1956), students (e.g., Frutcher & Skinner, 1966), heterogeneous groups of managers (e.g., Ghiselli, 1960; Grant, 1955), and lower level supervisors (e.g., Mandell, 1956; Peres, 1962) or even foremen (e.g., Creager & Harding, 1958). Despite this variety of subjects, methods and items, the factors which emerged bear considerable similarity to the variables found in studies focusing exclusively on predicting managerial effectiveness.

Bass (1981), based on a review of 163 studies conducted between 1948 and 1970, characterized leader traits along six dimension. In addition to physical and social background characteristics, he summarized the literature on psychological traits as follows. Intelligence and ability was found to be a fair predictor of success at low to middle levels of management but declined in discriminating effectiveness in higher level managers. In general, the personality factors of alertness, originality, self-confidence, personal integrity, and ascendance orientation were predictive of effectiveness. The relationship of emotional balance to effectiveness was less determinate. In describing the task-related characteristics associated with success, Bass (1981) included a high need for achievement, sense of responsibility, task orientation, dependability, and strong motivation, drive, and persistence. As regards social characteristics, effective managers were described as active participants in a variety of activities, interpersonally skilled, and cooperative.

The AT&T Management Progress Study

The findings from the Management Progress Study conducted by Bray and his associates (e.g., Bray, 1964, 1982; Bray et al, 1974; Bray & Grant, 1966; Grant & Bray, 1969) over a 27 year period at AT&T (American Telephone & Telegraph) is perhaps the most conclusive evidence that one may cite regarding the variables that predict managerial effectiveness. After selecting an a priori list of 25 personal characteristics hypothesized to be related to management progress, a variety of techniques were devised in order to reveal the variables. These assessment procedures (including in-depth interviews, a variety of psychological tests, and situational exercises) were then used to arrive at predictions regarding the progress of 422 entry level managers. These predictions were then not only evaluated longitudinally, but were uncontaminated by divulging assessment findings to the organization. Because of the importance of this body of research, findings regarding each of the assessment procedures will be dealt with in some detail.

The AT&T assessment center dimensions. After assembling, reviewing, and discussing the results of all assessment techniques, each assessee was rated on the 25 personal characteristics using a 5 point scale. Ratings were made by an assessment staff usually consisting of nine members which included psychologists, other professionally trained assessors, and, in some cases, company managers. After a discussion of rater differences whereby ratings could be changed, a final consensus rating was obtained on each variable by averaging the ratings of the entire assessment staff. A trichotomized overall rating

of the likelihood of the assessee progressing to middle management within 10 years or less was also made. This rating was made taking into account the degree of staff agreement. The 26 ratings were then intercorrelated and the resulting matrix factor analyzed using a hierarchical method (developed by Wherry, 1959) which solves for higher order factors. One "general" higher order factor was obtained for the noncollege educated assessees which was interpreted as reflecting the assessment staff's overall "model" of managerial potential (viz., influenced by overall rater "halo effects"); three such general higher order factors were found for the college sample. These general factors accounted for nearly half the accounted-for variance in the ratings and were the best predictors of subsequent management progress.

In addition to these general effectiveness higher order factors, a number of first-order factors were determined (7 for the college sample and 6 for the noncollege sample) which were interpreted to reflect more specific judgments of the assessment staff. The 26 variables and the seven specific first order factors on which they loaded (for both the college and noncollege samples) are shown in Table 2 (Bray et al, 1966; Bray, 1982). While the zero order correlations of the general effectiveness factors with progress were considerably higher, the specific factors also showed some validity as predictors. In particular, administrative and interpersonal skills, intellectual ability, lack of passivity and control of feelings (i.e., stability of performance) showed a relationship to management progress (Bray et al, 1966).

Table 2

The AT&T Management Progress Study Assessment Center Dimensions

Factor Name	High Loading Variables
Administrative skills	Organizing and planning Decision making Creativity
Interpersonal skills	Leadership skills Oral communication skills Behavior flexibility Personal impact Social objectivity Perceptions of threshold social cues
Cognitive skills	General mental ability Range of interests Written communication skills
Stability of performance or Control of feelings[a]	Tolerance of uncertainty Resistance to stress
Work motivation	Primacy of work Inner work standards Energy Self-objectivity
Career orientation	Need for advancement Need for security Ability to delay gratification Realism of expectations Bell system value orientation
Dependency	Need for superior approval Need for peer approval Goal flexibility

Source: Adapted from Bray & Grant (1966) and Bray (1982).

[a]Bray and Grant (1966) originally named this factor "control of feelings;" more recently Bray (1982) referred to it as "stability of performance."

The AT&T personality test predictors. A number of personality test factors were found to be highly and reliably correlated to these assessment center dimensions (Bray, 1982). Motivation to lead was related to all seven assessment center predictors. Ambition and optimism were related to all assessment factors except general mental ability and independence. Self-esteem and impulsivity were related to three of the seven factors, and affability was negatively correlated with independence from others.

The AT&T interview predictors. In the Grant and Bray (1969) study, a large number of the 18 interview variables which they used were found to be correlated with staff judgments derived from other information sources. Of 36 correlations of two groupings of these 18 variables with staff predictions, 22 were significant at the .05 level. The most potent interview variables for predicting staff predictions were ratings of personal impact/forcefulness, oral communication skills, energy, and need for advancement. In addition, a number of variables were determined to be reliably predictive of subsequent management progress. Variables reflecting career motivation, lack of dependency needs, work motivation, and interpersonal skills were related to individual differences in salary increases 8-10 years later. While general mental ability was not among the 18 variables coded from interview reports, a related variable, "range of interests", was also found to predict salary progress.

AT&T follow-up. The most recent follow-up of the research sample has led Bray (1982) to conclude that successful managers were found to be high in the factor dimensions of administrative and

leadership skills, intellectual ability, work motivation, career orientation, stability of performance, and independence from others. Of the 25 singly rated personal characteristics, the best for predicting managers' promotions included skill in human relations, organization and planning, oral communications, a need for advancement, high energy, and a tolerance of uncertainty and resistance to stress.

The Ghiselli Managerial Talent Study

In a fifteen year study of diverse samples of managers, Ghiselli (1971) assessed (by means of a self-report checklist) the relative importance of 13 ability, personality, and motivational traits to the differentiation of successful versus unsuccessful managers. The six traits that played a major role in this differentiation (in order of importance) were the following: supervisory ability; need for occupational status; intelligence; need for self-actualization (n.b., defined similarly to work motivation); self-assurance; and decisiveness. Three other variables played a minor and somewhat equal role: a lack of a need for security; a lack of working class affinity; and, initiative. With the exception of the variable "decisiveness," each of Ghiselli's (1971) predictors has its parallel among Bray's (1982) set of assessment center and personality test predictors.

The McBer & Company Research on Competence

Psychologists in the management consulting firm of McBer & Company conducted a study aimed at determining the competencies shared by effective managers across all types of management jobs (Boyatzis, 1982). Of 21 hypothesized competency variables, 12 were found to significantly differentiate effective and ineffective managers.

Multiple assessment techniques were employed to determine both type and level of competencies. These included a weighted self-report check-list, behavioral event interviewing, (Flanagan, 1954, McClelland, 1975) tests to reveal motives (e.g., nAchievement based on work by Atkinson, 1958; McClelland, 1961) and learning style (Kolb, 1971, 1976). A cluster analysis was selected to group these 21 competency variables because of the assumption that competencies and clusters operate in the context of one another to result in effective performance and are not orthogonally related. The resultant clusters with the corresponding competencies found to relate to effectiveness are as follows:

1. The goal and action management cluster consisted of the following competencies: efficiency orientation (in part assessed by nAchievement); diagnostic use of concepts; proactivity; and concern with impact (partly assessed by nPower).

2. The leadership cluster consisted of the competencies labeled: self-confidence; use of oral presentation; and conceptual-ization (only significant at middle manager and executive levels). A fourth competency in this cluster which was labeled logical thought was only moderately related to effectiveness.

3. The human resource management cluster included the following competencies; use of socialized power (i.e., team or alliance building influence); and, the ability to manage group process (which was significant only for mid and executive level managers). Two more competencies in this cluster were moderately related to success. Positive regard for others was only related to the effectiveness of

middle managers. Accurate self assessment skills were moderately related to success at all management levels.

4. The focus on others cluster included variables conceptualized to reflect aspects of emotional maturity. Self-control (which was especially significant for entry level managers), perceptual objectivity (particularly important at the mid-manager level), and stamina and adaptability were found to be related to success. Excepting executives, a concern with close relationships (in part assessed by nAffiliation) was somewhat related to ineffectiveness. This finding of a negative relationship between effectiveness and affiliation is similar to Bray's (1982) finding of a negative correlation between the personality variable of affability and the predictor variable of independence from others (which in turn was correlated with success). It was also found that effective managers in manufacturing were higher on affiliation, effective marketing managers were next most likely to be affiliative, and finance managers were least likely to possess this characteristic.

5. A fifth cluster entitled directing subordinates was only moderately related to effectiveness in managers. The three competencies included in this cluster were developing others, use of unilateral power and spontaneity. These were important only for entry level managers and declined in importance as managers moved up the organizational hierarchy.

The McBer Company findings have some interesting implications. As Boyatzis (1982) points out, the intent was to find the common denominators of managerial effectiveness. In general, they found

successful managers to be high in achievement orientation, able to use concepts diagnostically, proactive, concerned with impact, confident, verbal, able to use socialized power in team or alliance building, and having stamina and adaptability. Despite their interest in identifying predictors of effectiveness common to all managerial jobs, these researchers found a number of predictors to be differentially relevant to the effectiveness of managers differing in hierarchical level within their organizations or differing in their functional specializations. For example, conceptualization skills and the ability to manage group process were related to success at middle manager and executive levels only. The need for affiliation was related to the success of executives and manufacturing personnel, but in other groups it was related to ineffectiveness. Self-control, developing others, and use of unilateral power were differentially relevant at only the entry level of management. Positive regard for others and perceptual objectivity were especially important for the success of middle managers, but not for those at the entry or top levels of management.

Predictors of Success for Homogeneous Management Jobs

Thus far, this review of the research literature on the predictors of managerial effectiveness has primarily focused on characteristics common to all managers. However, a number of studies have focused on specific homogenous groups of managers. For example, studies of effective top level executives (see e.g., Kotter, 1982a,b; Levinson, 1980) have emphasized conceptual and interpersonal skills, whereas studies of first line supervisors and entry level managers (e.g., Borman, 1973; Ghiselli & Barthol, 1956; Sartain & Baker, 1978)

stress administrative skills, motivational qualities such as loyalty, and the ability to direct subordinates. Some theoretical and observational findings relevant to different homogeneous managerial groups will be discussed next.

Predictors for Differing Management Levels

Katz and Kahn (1978) presented a model in which they hypothesized a different set of cognitive and affective abilities for managers at different management levels. They hypothesized that managers at the lowest level of management need technical knowledge, understanding of rules, and interpersonal skills to deal effectively as supervisors of others. Middle managers were hypothesized to need a broader intellectual perspective and scope along with the human relations skills to integrate the formal and informal relationships within the organization. Executives were thought to need the greatest intellectual scope and be able to perceive the organization as a whole unit within the larger outside environment, as well as needing to be "charismatic."

This model is a bit too general and theoretical for predictor identification purposes; however, some other research findings provide additional support for its overall credibility. For example, Guglielmino (1979) concluded from a nationwide survey of directors of training in Fortune 500 companies, professors of management, and a sample of mid-level managers that there is a hierarchy of management skills. In his investigation of the skill mix needed at three levels of management (entry, middle, and top), Guglielmino (1979) categorized 20 activities of managers within the content domains of conceptual, human relations, or technical skills. He found that while managers at all levels needed

conceptual, human relations, and technical (including administrative) skills, the perceived importance of the skills varied with level of management. Conceptual skills were most important for top level managers and least important for entry level managers. The reverse relationship held for technical and administrative skills. Human relations skills were most important for middle managers in this study.

Conceptual skills were similarly found by Pavett and Lau (1983) to be rated as more important by top level managers. However, in this study, no significant differences were found between three levels of managers in their ratings of the perceived importance of human, technical, or political skills.

Executive Characteristics

Two researchers (Kotter, 1982a,b; Levinson, 1980) have recently focused their attention on managers at the top of the management hierarchy; namely, general managers, chief executive officers and presidents of corporations. Kotter (1982a,b) conducted a five year study of 15 general managers (GMs) in 9 corporations to determine what they do. Characterizing the GM job as consisting primarily of "agenda setting" and "network building," successful GMs had a number of qualities that facilitated these goals. Kotter (1982a) summarized these by describing the GMs as having above-average intelligence, good analytical and intuitive skills, they were optimistic and achievement oriented. Further, they were very ambitious and like power. They were also described as being personable, good at developing relationships, were emotionally even, and had an unusual ability to relate to diverse groups of business specialists. They were aggressively inquisitive and

had a broad base of organizational understanding. They were practical in selecting goals and strategies within their power to implement. They had considerable stamina and adaptability. Of great importance to the effectiveness of these GMs was the ability to build a larger network of interdependent relationships. Considerable skill in interpersonal relations was demonstrated. A wide range of interpersonal tactics were used in wielding influence (most often indirect) and in obtaining information. In general, Kotter's (1982a,b) characterization of these GMs rather closely parallels the findings of the AT&T studies (Bray, 1964, 1982; Bray et al, 1966, 1974).

Levinson (1980) identified 20 dimensions of personality as criteria for selecting chief executives and categorized them within the following three content domains: thinking; feelings and interrelationships; and, outward behavior characteristics. They are shown in Table 3 below. The three categories are not empirically derived and have little resemblance to the factors emerging from the AT&T studies. However, from a perusal of the variables themselves, some similarities and differences may be noted. Motivational and emotional variables are similarly stressed; however, Levinson (1980) seems to place greater emphasis on conceptualization skills, interdependence (as compared with independence) of others, and less emphasis on administrative or technical skills.

Leader Behaviors and Supervisory Characteristics

Another perspective on the predictors of effectiveness may be drawn from the extensive literature on leader behavior and supervisory styles (for reviews see e.g., Bass, 1981; Bowers & Seashore, 1966). A

Table 3

Levinson's Criteria for Choosing Chief Executives

I. THINKING

1. Capacity to abstract, to conceptualize, to organize, and to integrate different data into a coherent frame of reference.
2. Tolerance for ambiguity, can stand confusion until things become clear.
3. Intelligence, has the capacity not only to abstract but also to be practical.
4. Judgment, knows when to act.

II. FEELINGS AND INTERRELATIONSHIPS

5. Authority, has the feeling that he or she belongs in the boss's role.
6. Activity, takes a vigorous orientation to problems and needs of the organization.
7. Achievement, oriented toward organization's success rather than personal aggrandizement.
8. Sensitivity, able to perceive subtleties of other's feelings.
9. Involvement, sees self as a participating member of the organization.
10. Maturity, has good relationships with authority figures.
11. Interdependence, accepts appropriate dependency of others as well as of himself or herself.
12. Articulateness, makes a good impression.
13. Stamina, has physical as well as mental energy.
14. Adaptability, manages stress well.
15. Sense of humor, does not take self too seriously.

III. OUTWARD BEHAVIOR CHARACTERISTICS

16. Vision, is clear about progression of his or her own life and career, as well as where the organization should go.
17. Perseverance, able to stick to a task and see it through regardless of the difficulties encountered.
18. Personal organization, has good sense of time.
19. Integrity, has a well established value system that has been tested in various ways in the past.
20. Social responsibility, appreciates the need to assume leadership with respect to that responsibility.

Source: Levinson, 1980.

series of factor analytic studies conducted by researchers at Ohio State University, at the University of Michigan Survey Research Center, and at the Research Center for Group Dynamics consistently derived two major dimensions of leader behavior. These factors were named "consideration" and "initiation of structure" in the Ohio State Studies (Halpin & Winer, 1957), "employee orientation" and "production orientation" in the Michigan studies (Katz et al, 1950), and "group maintenance functions" and "goal achievement functions" at the Research Center for Group Dynamics (Cartwright & Zander, 1966). While these factors varied slightly in their definitions, their similarities and the consistency of findings regarding their importance for leader effectiveness has been quite noteworthy. Therefore, in any research endeavoring to predict success in leadership roles, account must be taken of these characteristics.

A number of studies of the attributes of effective first line supervisors and entry level managers typically stress skills related to the direct activities of directing subordinates, carrying out tasks responsibly, and demonstrating company loyalty. As an example, Borman (1973) empirically determined that effective first line insurance supervisory performance could be predicted from the following factor dimensions (in order of their validity): ability to handle administrative detail; motivational qualities inclining support of company policies and directives; initiative and a sense of responsibility; and, ability to organize and utilize manpower resources. Consideration toward subordinates (which included sociability and sociometric popularity ratings) did not differentiate effective and ineffective

supervisors.   On the other hand, Sartain and Baker (1978) found successful first-line insurance company supervisors to be more person-centered, supportive, democratic and flexible than their less success-ful counterparts.   Borman's (1973) finding of loyalty was supported in the Sartain and Baker (1978) study.

Ghiselli and Barthol (1956) similarly found that being well liked was not among the self-ratings of successful supervisors; however, this did characterize those considered ineffective.   Effective supervisors depicted themselves as planful, loyal to the company and to subordinates, and feeling the responsibility of working with people to achieve organizational goals.

Predictors of Success in Different Job Functions

As an example of how managers differing in functional special-ization may require different characteristics for effectiveness, Hinrichs' (1978) study of marketing managers may be cited.   In addition to the characteristics of self-confidence and oral communication skills often found to be predictive of the success of managers, this study found successful marketing managers to be high in aggressiveness and persuasiveness.   As an another example of the differing characteristics found in different management specialties, Boyatzis (1982) found affiliativeness to characterize effective manufacturing managers, but not financial managers.

Summary of Predictor Research

A number of characteristics seem to be predictive of effective-ness across all management jobs.   Included among these are interper-sonal skill, integrity, self-confidence, and motivation to work.

General mental ability may only be differentially important for effectiveness at entry levels of management while broad conceptual skills appear to increase in importance as managers move up the organizational hierarchy. Emotional stability appears to be primarily important for success at lower levels of management. The ability to directly plan and direct the work of subordinates and handle administrative detail appears to decline in importance as managers move up in level of authority. Such skills appear to be especially important for jobs with strong supervisory requirements (a large number of which are located at lower levels of management. In addition, supervisory positions appear to require great awareness of and loyalty to organizational policies and issues. Team and group oriented skills appear to be most important for middle managers.

The role that sociability and affiliative tendencies play in effectiveness is less clear. While such tendencies appear to be negatively related to effectiveness in entry and middle managers, as well as those in financial specialties, it appears that there may be a positive relationship of these traits to the success of managers in marketing or manufacturing. Also, there is some indication that affiliativeness increases in importance for top management as long as these managers are able to remain relatively self-sufficient and not be dependent on others for the satisfaction of these needs. Some traits may be uniquely important to some functional areas. For example, persuasiveness seems to be primarily important to the success of manager in marketing and sales.

It appears that more research is needed to determine the psychological variables having differential relevance for a number of management specialties. In the next section, the research literature addressing the need to understand and categorize the nature of managerial work will be presented. By obtaining a clearer understanding of the nature of the demands common to homogeneous groups of management jobs, the groundwork may be laid for deducing the psychological characteristics required to meet those demands.

The Nature of Managerial Work

Management jobs are multidimensional entities, yet in the quest for valid predictors of effectiveness, the typical validation study seems to implicitly assume that some unidimensional definition can be used as a criterion against which to evaluate predictors. Dunnette (1976) suggested that the research literature is "filled with studies where the possibility of dimensionality of work performance within jobs has been ignored in favor of obtaining global ratings of...job performance" (p.497). Recognizing the difficulties of such an approach, a number of researchers (e.g., Fleishman, 1967; Dunnette, 1976) have called attention to the need for establishing a link between a taxonomy of the nature of work itself and a taxonomy of the nature of the human attributes (i.e., knowledge, abilities, skills and other personal characteristics) required to perform work. Ideally, such a linkage would enable one to specify the needed attributes for each dimension of work and then weight attribute requirements according to job dimension weightings.

Dunnette and Borman (1979) have, however, outlined a number of thorny methodological issues which stand in the way of accomplishing linkages between jobs (and/or components) and the attributes needed for their successful performance. As examples, they mentioned problems of determining methods for sampling the total job domain, for estimating accurately the relative importance, complexity, difficulty, etc., of job elements, and then determining appropriate statistical criteria to arrive at job dimensions and the relative similarities/differences among jobs. Of special relevance to the current investigation, Dunnette and Borman (1979) also pointed to methodological concerns regarding the appropriate role of experts in describing jobs, in judging personal qualifications for those jobs, and in determining the relative degree of congruence between job dimensions and attribute measures.

The ability to describe a job in terms of its job components and then link these to attributes required for their successful performance has important implications for the issue of validity generalization. Schmidt and Hunter (1977, 1980), rejecting the notion that validity is situation specific, have proposed the concept of validity generaliza-tion as a way of obtaining samples sufficiently large to detect differences. One approach that has been used to increase sample sizes in predictive studies has been to employ the job component or "syn-thetic" (Balma, 1959, Lawshe, 1952) validity procedure advocated by some researchers, most notably by McCormick (1959, 1976, 1979). In this approach predictor variables may be validated against the perform-ance of a job component which a variety of jobs commonly possess.

Another approach has been to cluster whole jobs into "job families" on the basis of their job component similarities in order to obtain large enough samples to determine reliable predictor relationships (for a thorough review of this research literature see e.g., Pearlman, 1980).

In order to empirically demonstrate the differential relevance of psychologists' decision strategies to differing job requirements, a simplified job family approach was employed in the current study. Therefore, efforts to describe and group management jobs on the basis of their job components will be dealt with next.

While a number of research efforts have been directed at developing general taxonomies of worker activities and behavior (e.g., Fine, 1955; Hackman, 1968; McCormick, Cunningham & Gordon, 1967; McCormick, Jeanneret, & Mecham, 1972), less research has specifically focused on the development of a taxonomy of managerial work. In this domain, the most noteworthy functional taxonomies have been developed by Hemphill (1960) and, in an extension of Hemphill's work, by Tornow and Pinto (1976).

Tornow and Pinto (1976) conducted an analysis of the content of management jobs in six diverse and autonomous subsidiaries of Control Data Corporation. This was done through the administration of a questionnaire (The Management Position Description Questionnaire, MPDQ) which was developed to aid compensation practitioners in evaluating the worth of management jobs. The content domains followed Hemphill's (1960) categorization; activities, concerns, responsibilities, demands or restrictions, and miscellaneous characteristics. Care was taken to obtain a representative sample of managerial behaviors independent of

worker traits, abilities, or other individual difference variables. Later revisions were made to the questionnaire to provide scope data (e.g., size of budget, payroll, etc), to include more items directed at lower levels of management, and to assess more accurately the nature of position decisions, contacts, and know-how in order to improve the interpretability and usefulness of the MPDQ results for compensation analysts (Page, Gomez, & Tornow, 1982). A factor analysis of incumbents' responses to the MPDQ resulted in a 13 factor solution. Although computed differently, these factors bear considerable similarity to Hemphill's 10 factors. The resulting factor dimensions with descriptions based on high loading items can be found in Appendix A.

After obtaining the 13 factor dimensions, Tornow and Pinto (1976) computed cluster analyses of the profiles of factor scores obtained for each manager. A cluster solution clearly assigned 70 percent of the 433 jobs analyzed, 22 percent of the jobs overlapped clusters, and approximately 8 percent were either misfits or isolated jobs. Of the 10 clusters, six clearly corresponded to three management levels in the organizations (upper, middle, beginning) and three functional specializations (marketing, personnel, and legal). Table 4 shows the standard score mean profiles of these six clusters.

Some trends and generalizations may be seen from an examination of Table 4. In comparing levels of management, one can observe that only beginning managers' jobs included an emphasis on direct supervision of others and on performing staff services. Supervisory responsibilities decreased with higher levels of management; however, the establishment of policies and broad responsibility for human re-

Table 4

Managerial Cluster Profiles
for Jobs at Different Levels of Management and Function

	U P P E R	M I D D L E	E N T R Y	M A R K E T I N G	P E R S O N N E L	L E G A L
1. Product, marketing, & financial strategy planning	1.3	-.6	-.6	.3	1.1	-.8
2. Coordination of other organiz'l units & personnel w/o direct control	-.7	.5	-.3	.6	1.0	.1
3. Internal business control: allocation of resources, budgeting, goal setting, etc.	.4	.7	-.3	-.8	.4	-.8
4. Products & services	-.2	.7	.7	.3	-1.4	-.6
5. Public & customer relations	-.3	-.3	-1.0	1.2	-.1	.9
6. Advanced consulting involving technical expertise	-1.1	.2	-.5	-.4	.0	.5
7. Autonomy of action & decision making	.6	.6	.8	.0	.3	.9
8. Approve financial commitments	.5	.1	-.1	-.2	-.4	1.7
9. Staff services to supervisors	-.9	-1.1	1.0	.1	.7	1.1
10. Direct supervision of others	-.5	.0	.8	.5	.2	-1.0
11. Complexity & stress	.2	.1	-.2	.1	-.2	.6
12. Advanced financial responsibility	-.1	.0	-.2	-.6	-.4	.9
13. Broad personnel responsibility	1.3	-.4	-.1	-.2	2.0	-.8

Source: Adapted from Tornow & Pinto, 1976. Profiles are standard
scores transformed to a mean of 0.0 and a standard deviation of 1.0.

sources was a major component of only top levels of management. Strategic planning was also only evident at the top level; however, internal business control appeared to be primarily a middle management responsibility. Incumbents at all three management levels equally described autonomous decision making, dealing with abstract or unstructured problems, and complexity and stress as moderate components of their jobs. In keeping with other studies differentiating management levels, top managers described having very little responsibility for using technical expertise in a consultative capacity.

Tornow and Pinto (1976) also obtained three clusters that were composed of specialists in the areas of marketing, personnel, and law. Marketing specialists were primarily involved in public and customer relations; to a lesser degree, they had an organizational coordination function without any direct control, and they engaged in supervisory functions. Second only to top level management, they had some responsibility in the area of long range strategic planning.

Personnel specialists' jobs were characterized by having broad responsibility for the management of human resources, having a major coordination function of organizational units without any direct control and, engaging in staff services. However, they had little responsibility for company products, corporate strategy planning, or financial commitments and asset preservation.

The legal cluster, in order of importance, was characterized by the following job components: having a major role in making irreversible decisions regarding financial commitments; providing staff services; having major responsibility for the preservation of financial

assets; public relations and negotiations; and, autonomous decision making under considerably complex and stressful circumstances.

The intent of Tornow and Pinto's (1976) study was to categorize jobs for compensation purposes, rather than as a selection validation system. Therefore, this investigator is not aware that research at Control Data Corporation was directed at linking performance within cluster groupings to the attributes predictive of that performance.

The research literature reviewed earlier suggested the possible differential relevance of psychological predictor variables to different management levels or to jobs varying in supervisory responsibilities or functional specializations. The analysis of management jobs conducted by Tornow and Pinto (1976) has identified some clusters of jobs varying in their job component profiles. The present investigation was undertaken in part to determine the attributes considered by one group of "experts" to be relevant to management effectiveness both across all management jobs and for subgroups divided by management level, supervisory responsibility, or functional specialties. If the attributes deemed important by a group of psychologists (experts) when evaluating the suitability of candidates for either any type or differing categories of management jobs were found similar to those found by other investigators to be predictive of success, it was assumed that the construct validity of their approach would be supported. In addition, further evidence of construct validity was expected to be found by logically linking psychologists' differential policies for some homogeneous subgroups of management jobs to the job demands found by Tornow and Pinto (1977) to constitute these subgroup-

ings.   The method used to investigate these expectations is described

in the next chapter.

CHAPTER III

METHOD

Psychologists

Forty-seven Ph.D. level psychologists with a minimum of two years experience on the staff of a corporate consulting firm were the source of data. Because only aggregate data were to be analyzed, any information identifying the psychologists was blind coded. Psychologists from 16 of 18 nationwide offices of the firm responded to the request for data.

The Consulting Firm

The consulting firm supplying data in this study has 18 North American offices (including one in Canada) plus two European offices (not included in the study because of potential language difficulties). Evaluating candidates for jobs in client companies is a small but important element of their management consulting practice.

Despite the considerable variety of methods used by different consulting firms to assess managers (Koten, 1978), this firm follows a rather standardized evaluative approach. Using an assessment procedure that consists primarily of an in-depth interview taking two to three hours, plus a twelve minute objective intelligence test, psychologists make judgments regarding the psychological characteristics of candidates. Unlike some consulting firms which simply evaluate candidates in terms of their psychological functioning without regard for the

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particular requirements of the job in which the candidate must ulti-
mately function, this firm also makes it a standard practice to
evaluate a position's psychological demands before determining a
candidate's suitability for the job. The evaluation of a candidate's
technical competence is left to the referring company. In an effort to
achieve a compatible match between the psychological requirements of a
specific vacant position in a specific company and the psychological
characteristics of the candidate, the firm's policy is to obtain
relevant information about a job from the company prior to meeting with
the candidate.

Psychologists' A Priori Five-dimensional Model

This consulting firm advocates that every candidate be assessed
in terms of the following five broad dimensions of personality: intel-
lectual functioning; emotional maturity; interpersonal skills; insight
into themselves and others; and, organizational and supervisory ability
(Rohrer, Hibler, & Replogle, 1965, 1981). The firm's policy is to have
psychologists report in an unequivocal manner their judgments regarding
the specific candidate characteristics (intellectual and personality)
thought to comprise these dimensions. These judgments regarding the
candidate are reported in a narrative format to the referring company,
along with a hiring recommendation and suggestions for the future
development of the candidate. The report format is described in
greater detail below and a sample report is provided in Appendix B.

Data Collection

Initial Sampling

An initial pool of 692 reports and questionnaires on candidates for management jobs were collected using a purposive sampling technique. In an effort to increase external validity, a model of deliberate sampling for heterogeneity was selected (Cook & Campbell, 1979). The objective was to define a target class of reports that were heterogeneous with respect to psychologist report writer, district office, geographic location, client companies requesting reports on candidates, and such candidate characteristics as age, gender, the types of jobs for which they were appraised, and hiring recommendations. Because random sampling was not feasible, it was decided that the procedure likely to result in the least selection bias would result from having secretaries select a representative sample of reports. In order to achieve this objective the following procedures were followed.

Collection Procedures

A packet of materials (see Appendix C), including a letter explaining the general purpose of the research project, was sent to each of the 18 district office managers. Also, a detailed set of instructions for district administrative secretaries was provided to guide then in selecting and xeroxing 15 reports on manager candidates per staff psychologist, and then blind coding any identifying data regarding psychologists, candidates, or client companies. Secretaries were also given responsibility for distributing to and collecting from each psychologist a copy of their reports to review along with a letter of introduction to the study plus instructions for completing a brief

questionnaire (see description below). Finally, secretaries were charged with forwarding the materials collected from the psychologists to the Chicago office.

Description of Research Materials

Reports

The psychologists' reports on candidates (see example in Appendix B) consist of two to three page single-spaced typed narratives covering the firm's a priori five dimensional model for describing a manager candidate's personality. Although varying in narrative style to some degree, each report typically makes reference to approximately six to eight specific candidate characteristics within each of the following five dimensions: intellectual effectiveness, emotional maturity, skill in human relations, insight into self and others, and the ability to organize and direct the work of others. Following these descriptive statements, hiring recommendations to the client company are specified. Finally, the reports conclude with a section highlighting a candidate's strengths and needs for future development.

Questionnaires

The psychologist writing each report completed a one page questionnaire assessing information regarding 1) the demographic characteristics of the manager candidates (viz. age, gender, and ethnic group membership) and 2) the types of jobs for which hiring recommendations were made. A copy of the questionnaire and its accompanying set of instructions to psychologists is included in Appendix D. The instructions to psychologists include the definitions used to operationalize the job categories.

Psychological Traits as Independent Predictor Variables

Because the reports were in narrative form, it was necessary to transform them into a set of quantified traits appropriate for determining psychologists' decisions about candidates (c.f., De Nelsky & McKee, 1969; Dicken & Black, 1965; Grant & Bray, 1969 for other instances of this procedure). A set of 55 psychological traits was initially selected so as to be representative of the five dimensions of personality covered in the reports (Rohrer et al, 1965, 1981), as well as to include personality characteristics reported in the research literature on management to be the best predictors of effectiveness. While the term "psychological traits" is used here to provide a brief and encompassing descriptive label for the characteristics that were rated, the set of variables included abilities, skills, personality characteristics, motives, and behavioral descriptors.

Development of the psychological trait rating scale. A systematic sample of 15 reports (designated the developmental sample) was drawn from the total pool of reports in order to define and anchor the levels of each trait. With the exception of the variable general mental ability (which had seven levels), a five-point scale was used to rate each of the 54 traits from low (1) to high (5). In addition, examples of scoreable responses drawn from this developmental sample were used to anchor the five levels of each trait. The trait definitions and their anchors are included in Appendix E.[1]

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[1]The definitions and anchors provided in Appendix E represent the final revision of the trait rating scale obtained after an initial check of intercoder agreement on 25 cases. In the original version, ratings of (6) were allowed on 12 variables to represent an excessive amount of the characteristic. Because the distinction between very

Definition of the Research Population

Sampling

A systematic sample of 455 reports was selected from the pool of 692 reports so as to achieve a stratification of district offices and psychologist report writers. The reports were then reordered randomly and numbered to identify a coding sequence. The first five cases were used solely for the purpose of training coders leaving 450 cases to constitute the total research sample. The rationale for selecting 450 cases was based on balancing considerations of having sufficient statistical power to conduct subsequent regression and factor analyses (see below) while keeping costs reasonable with respect to the time required to code materials.

The first set of 25 cases (designated Sample 1) was used to initially examine interrater reliability. The next set of 25 cases (designated Sample 2) was used to re-examine interrater reliability after a refinement of the coding scheme and coder retraining.

Manager Candidates

The 450 manager candidates who were the subjects of the psychologist's reports served as the units of analysis in this study. Candidates ranged in age from 21 to 62 (median age = 37). The sample consisted of 88.2% males and 11.8% females. Ethnic group origins were reported as follows: 97% of the candidates were White, 1.6% were of Hispanic origin, 0.9% were Oriental, 0.2% were Black, and 0.6% of the cases were designated as not known, other, or missing.

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high and excessive was found to be difficult and redundant (an excessive rating on one trait typically suggested a low rating on some other characteristic), any initial ratings of 6 were subsequently recoded.

Nearly two thirds (61.1%) of the candidates were appraised for positions having supervisory responsibilities. In regards to the level of management of the positions for which hiring recommendations were made, 14.9% were at a top level, 46.4% were at a middle level, and 37.3% were lower level. The functional specialties of candidate positions were distributed as follows: 177 jobs (41.6%) were in marketing or sales; 24 (5.6%) were in personnel or human resources development; three (.7%) were legal positions; 77 positions (18.2%) involved responsibilities for financial, accounting, or management information systems; 28 jobs (6.6%) were in engineering or research and development; 70 jobs (16.5%) were involved with the production, construction, or manufacture of products; 17 positions (4%) were in general administration; and 29 jobs (6.8%) were categorized as general management positions. Psychologists were not able to categorize 21 cases with this scheme and these cases were designated as missing along with four other cases with missing values due to coding errors.

Although the actual number and geographic location of client companies for whom these manager candidates were assessed is not known (due to blind coding), the method of collecting reports should have insured that at least 200 companies were represented.

Research Design

Overview

The overall aim of this investigation was to determine the construct validity of the clinical appraisal method used by a sample of psychologists to evaluate manager candidates. Towards this aim a number of logically derived assumptions regarding psychologists' hiring

recommendations were empirically examined through statistical modeling procedures (viz., linear regression and factor analytic models described in greater detail below).

Hypotheses

1. The first expectation to be examined was that the psychological characteristics used in psychologists' reports to describe candidates would be found to account for the major proportion of variance in their hiring recommendations.

2. Demographic characteristics of candidates (e.g., age, gender, ethnic origin) were not expected to be a significant factor in determining psychologists' hiring recommendations.

3. An empirically derived dimensional structure of the personality characteristics used to appraise candidates was expected to bear similarity to the dimensional structure found by other researchers to be predictive of managerial effectiveness.

4. It was further hypothesized that an empirically derived set of personality dimensions would be both more complex and efficient for capturing the variance in psychologists' recommendation decisions than the five dimensional framework used on an a priori basis by this sample of psychologists to organize and present their findings about candidates. Nonetheless, it was also expected that the five dimensional a priori model would also be found to statistically account for a significant proportion of the variance in their recommendations.

5. The types of jobs for which candidate recommendations were made were not expected, in and of themselves, to significantly affect the degree of candidates' judged suitability in psychologists' recom-

mendation decisions. Thus, the likelihood of a favorable hiring recommendation was expected to remain constant across different dimensions of management jobs (viz., supervisory responsibility, management level, and job function).

6. The relative importance given separate dimensions of personality in accounting for variance in psychologists' hiring recommendations (i.e., defined in terms of their regression weights) was expected to vary as a function of candidate differences in the types of jobs for which recommendations were made. Thus, linear regression models which included the interaction of job category information with personality dimension ratings were expected to account for significantly more variance in the psychologists' recommendations than would a model encompassing the personality dimensions alone.

Research Variables

Recommendation criterion. The psychologists' recommendations regarding candidates constitute the criterion measure. The manner of coding this variable is shown in Appendix F and described below. In order to define this variable in a manner that would account for as much variance as possible in the predictor ratings (see below), various means of operationalizing the variable were compared. Towards this aim, two through five level definitions of this variable were examined. Findings are presented in the next chapter.

Predictor variables. The set of 55 psychological traits described above were used to predict the recommendation criterion. Not only the entire set of single traits, but also several reduced dimen-

sional structures of these traits were examined for their ability to model psychologists' recommendations.

Moderator variables. Three different dimensions of managerial jobs were hypothesized to moderate the weights given the personality predictors in linear regression models of psychologists' recommendation policies. These dimensions include 1) the job's supervisory requirements, 2) the jobs's level in the organizational hierarchy, and 3) the job's primary functional nature. The operational definitions used to categorize and differentiate jobs along these dimensions were described above and can be found in Appendix D. The original coding of these variables is described in greater detail below.

Covariates. Demographic characteristics of managers were not expected to be constant across job categories (e.g., top managers are typically older and a higher proportion of females are typically found in personnel or marketing jobs than in engineering or manufacturing). To remove any possible effect of these differences, demographic characteristics were treated as covariates and statistically controlled for when accounting for variance in psychologists' recommendations.

<center>Coding Procedures</center>

Coders

The author (designated Coder A), who developed the coding frame, and an advanced graduate student in clinical psychology (designated Coder B) served as primary coders in this study. The fifty cases used to determine coder agreement were coded by both Coders A and B, and then each coder independently coded half of the remaining cases in the research sample. A third coder (designated Coder C), a psychologist

from the firm, coded the training cases plus three cases from the second sample of cases used to assess coder agreement.

Coding Forms

Two 80 column machine scoreable forms were used. A frame containing brief information regarding the coding of each column was specially designed to hold the forms and facilitate the coding task.

Codes

Identification codes. A number of codes were established to record on the first coding form the case sequence number, the firm's office identification number, the candidate identification number, and the coder's identification. A three digit code was used to record the case sequence number which represented the sequence of coding followed by coders. After the first 50 cases (which were coded by both coders) even numbered cases were coded by Coder A and odd numbered cases by Coder B.

Coders were required to transfer both the office identification number and the candidate identification number assigned by district office secretaries from the upper right hand corner of each psychological report and from Section IA of the Questionnaire. A two digit code was used to record the office identification number. The candidate identification number also consisted of a two digit code. A single digit code was used to represent the coder's identification.

Intelligence test score and form number. A two digit code was used to record the raw score achieved by a candidate on a twelve minute intelligence test (PPT raw score). Coders were required to transfer this number from the upper right hand corner of the psychological

report. A single digit code was used to record the PPT form number accompanying each test score.

Psychological trait variables. Columns 12 through 66 of the first coding form was used to record coders' ratings of the 55 trait variables. General instructions to coders for rating these psychological characteristics, along with the trait definitions and the anchors exemplifying trait levels, are included in Appendix E. To facilitate the coding task, the order in which the traits are listed was based on the probable order of each trait's occurrence in the reports.

Proportion of report content. After completing the trait ratings, coders recorded the proportion of content in the psychological report which was covered by the scale. This was used to assess the adequacy of the trait rating scale to capture the material contained in the reports.

Report difficulty. Coders were also asked to rate their estimate of the overall difficulty of translating each report into the set of rated traits. This variable was added after coders had rated 29 cases and was used to determine the relationship of overall difficulty to coder agreement (see below). Sources of difficulty were defined to include insufficient, contradictory, or ambiguous information. A rating of (1) was used to indicate that the report was relatively easy to rate and the statements in the report were clear, discriminating, and covered variables conforming to the trait rating scale. A rating of (2) was assigned to those reports perceived by coders to be moderately difficult and of average difficulty. A rating of (3) was used

when coders judged the report to be <u>very difficult</u> to translate due to deficient, ambiguous, or contradictory information.

   <u>The psychologist's hiring recommendation.</u>   The psychologist's hiring recommendation was the criterion variable used to determine decision policies.   In an effort to obtain as much variance as possible in the strength of the recommendations, nine double digit coding categories were employed.   The instructions to coders and descriptive anchors for these nine categories are provided in Appendix F.

   The first digit of the code was used alone to indicate whether the report included a separate recommendation section and, if so, the code reflected whether or not the candidate was recommended for hire. If no recommendation section appeared in the report, the first digit was coded 0; if the candidate was not recommended for a position, the first digit was coded 1; if the candidate was recommended, the first digit was coded 2.   Thus, the first digit alone could be used to dichotomize the recommendation criterion (viz., by only considering the 1 and 2 codes) in subsequent analyses.

   The second digit of the two digit code was used to indicate the apparent strength of a psychologist's appraisal of a candidate's suitability for the job.   Both the recommendation and/or conclusions sections of the reports were used in order to make this determination. In general, the strength of recommendation was based on whether the psychologist emphasized a candidate's limitations or strengths, or presented a balanced view of both (see Appendix F for the specific definitions used to anchor each level).

Demographic variables. Information on the demographic char-acteristics of each manager candidate was transfered from the question-naires (discussed above and shown in Appendix D) accompanying each report. The demographic variables included age, gender, and ethnicity of the manager candidates.

Job categories. The job variables included the supervisory requirements, level in the management hierarchy, and primary functional specialization of the positions for which hiring recommendations were made. These single digit coded variables were directly transferred from Section III of the questionnaire (included in Appendix D).

Coder Confidence

Rationale. In an effort to improve the quality of meta-analytic research, Orwin and Cordray (1985) suggested that a distinction be made between coding complexity and reporting quality as explanations for differences in coder agreement across variables involving inferential ratings. To facilitate this differentiation, they used a 3-point confidence scale to rate the perceived accuracy of each data point recorded on the coding form. Orwin and Cordray's (1985) finding that confidence ratings were associated with both reliability and the strength of observed interrelationships suggested that using confidence ratings could help counter spurious conclusions that may result from deficient reporting.

Because the reports to be transformed into trait ratings in the current investigation varied in the explicitness with which each of the traits was discussed, coders' confidence in making each trait rating was also expected to vary as a function of the degree of the explicit-

ness. Thus, additional ratings of the confidence with which coders made each of their trait ratings were included in this study. Such confidence ratings were expected to be useful in accomplishing several objectives. First, they were expected to facilitate making a distinction between reporting deficiencies (i.e., lack of explicitness in the report leading to lower coder confidence) and coding complexities (e.g., attentuation due to lack of variance in the ratings, ambiguous trait definitions, or unclear trait anchors) when accounting for coder disagreement and when calibrating coder agreement. Also, as an alternative to obtaining large amounts of missing data on the trait ratings when coder confidence was low, the use of confidence ratings permitted a forced rating format to be adopted for the trait variables. In this manner, any decisions about whether to treat a trait rating as missing in subsequent analyses could be made after an empirical examination of the relationship of low confidence to coder agreement. Finally, confidence ratings were also used to provide a means of empirically checking the specification of trait variables used in transforming the reports. In the event that a trait was referred to explicitly in less than one third of the reports, and the lack of explicitness was not related to other research factors (e.g., job types or demographic subgroups), then that trait could be dropped from subsequent analyses as being irrelevant to the psychologist report writers.

Confidence ratings. A 3-point confidence scale was used to record on a second coding form coders' ratings of the explicitness of information contained in each narrative report for making each of their

55 psychological trait ratings. A high confidence rating of 3 indicated that a trait rating was based on explicit reference in the report to a candidate's standing on the trait. A moderate confidence rating of 2 indicated that the coder made an inferential judgment regarding a trait rating. Coders gave the lowest confidence rating of 1 to those trait ratings made on the basis of a simple guess.

Coder Agreement

Overview

Because of the large number of variables (69) to be coded in this study, and the judgmental nature of the coding task for the 55 psychological trait variables, coder agreement was examined from several vantage points. The agreement between coders A and B on two samples of cases (n_1 = 24, n_2 = 25, total n = 49) was investigated using different estimates of interrater reliability. Pearson r correlations were computed for the personality trait ratings and for other integer variables (viz., case identification number, office ID, candidate ID, PPT score, PPT form number, candidate age, proportion of content, and report difficulty). Cohen's (1960) kappa was used as a coefficient of agreement on the following nominal scale variables: ethnic group membership, supervisory requirements, job level, and job function. The Phi coefficient was used to assess agreement on sex.

Coder agreement was not expected to be a problem across non-judgmentally coded variables (i.e., where information such as identification codes, test scores or questionnaire items was merely recovered). However, on variables requiring coder inference or judgment, agreement was expected to be more problematic. Included among these

variables were the following: strength of the psychologists' recommend-ations, the coders' estimate of the proportion of report content covered by the trait rating scale, the coders' perception of the difficulty of coding each report, the coders' confidence in rating each trait, and, finally, the 55 psychological traits.

The reliability of the trait rating scale, as well as the training and calibration of coder agreement in rating the traits, was a major focus of interest in the earlier phases of this research project (van der Plas & Bryant, 1985). Because the trait ratings were based on an interpretive reading of reports, coder agreement on these variables was a major consideration in this investigation. As pointed out by Dicken and Black (1965), such ratings are actually two interpretive steps from the original source data provided by candidates. Despite this, Dicken and Black (1965) concluded that the very satisfactory reliabilities they obtained in rating personality variables from psychological reports suggested that the necessity of rendering narra-tive reports into a form suitable for statistical treatment should be no obstacle to researchers.

Several factors having a potential effect on the size of the Pearson r estimates of interrater reliability of the personality trait variables were investigated. The distributions of the ratings made on the personality traits were examined to assess whether correlations might be attenuated by skewness or lack of variation. The effects of retraining and reclarification of the coding categories for some trait variables between Samples 1 and 2 were examined. Also, the potential effects of coder confidence (as an indicator of report quality) on

intercoder reliability were examined.   Procedures for training coders and assessing the effect of factors having a potential effect on the magnitude of agreement will be discussed in greater detail below.

Coder Agreement on the Psychological Trait Variables

Initial training of coders.   Five pilot cases were used by Coder A to initially train Coder B.   The first two cases were coded together.   The next three cases were coded independently.   After each case, coders discussed any items of disagreement.

Sample 1.   Twenty-five cases were then independently coded by both coders following the same prescribed random sequence of cases. The first case in this sample was subsequently determined to be contaminated by coder discussion and later dropped.

Initial check of coder agreement.   Pearson r reliability coefficients were computed for each of the 55 trait ratings in order to examine the agreement between coders A and B on the cases in Sample 1. Traits with reliability coefficients less than .60 were examined for degree of disagreement, possible coding complexities, and possible effects of deficient reporting.   The source of low coder agreement was attributed to deficient reporting when either or both coders rated a large proportion of cases on a trait under conditions of low confidence and other types of coding complexities were not an apparent source of disagreement.   In order to assess whether coding complexities were the source of unreliability, the distributional characteristics of each trait, as well as coder reports of rating ambiguities, were taken into consideration.

Calibration of coder agreement. Sources of disagreement on the trait variables rated from the reports in Sample 1 were discussed by coders A and B. Two strategies were then adopted for calibrating coder agreement. For those trait variables with low agreement across confidence levels (i.e., unrelated to deficient reporting), efforts were directed at improving the trait's definition and anchors. However, where lack of coder agreement appeared to be a function of deficient reporting, retraining focused on clarifying the inferential processes coders were using to make lower confidence ratings.

Recheck of coder agreement. Twenty-five additional cases were then independently rated by coders, again following a prescribed random sequence. Pearson r reliability coefficients were computed for these cases. Again, the distributional characteristics of the traits were examined and coders discussed the basis for disagreement on ratings made on any traits having reliability coefficients less than .60.

Comparison of Samples 1 and 2. The two reliability samples were compared by examining the significance ($p < .05$, two-tailed) of both the mean change in r (via Fisher's z' transformation of r, Cohen, 1977) across all traits, as well the significance of change in r for each of the 55 variables. Also, change in r was examined for subsets of these traits categorized by type of between-sample retraining treatment received.

One question to be addressed pertained to whether coders or samples systematically differed in the distribution of trait ratings, or if these two factors interacted in some manner. While a two-way multivariate analysis of variance (MANOVA) would have been a desirable

approach to answering this question, no overall F tests could be obtained for these effects due to multicollinearity and an insufficient ratio of cases to variables. Therefore, univariate effects were examined, instead. Because of the error rate problem inherent in multiple F tests, a more stringent value of alpha (.001) was employed (see Cook & Campbell, 1979 for a discussion of this problem and the compensatory technique for dealing with it).

Combined sample reliability. Samples 1 and 2 were combined in order to compute final Pearson r coefficients of reliability. This was done both to gain greater statistical power and to obtain a better estimate of the dispersion of ratings on each trait variable. Of particular concern was the identification of traits having either a severely skewed dispersion of ratings or a serious lack of variation, leading to attenuated correlation coefficients.

Intercoder agreement as a function of coder confidence. It was important to determine empirically whether coder agreement was related to deficient reporting (as suggested by coders' confidence ratings). Samples 1 and 2 were combined in order to examine this relationship. Interrater reliabilities for all 55 trait variables were computed for three conditions of confidence. Condition I included all valid cases rated at all levels of coder confidence. Condition II included only those cases where the trait was rated with at least moderate coder confidence. Condition III included only those cases rated with high coder confidence. Differences in mean r for each of these conditions were then examined.

Conceptual Distinctiveness of Coder Agreement and Coder Confidence

Although it was expected that reliability would be higher under conditions of higher coder confidence, the findings of Orwin and Cordray (1985) suggested that confidence and reliability were, nonetheless, conceptually distinct. In order to demonstrate this distinctness, the 55 trait variables were first ranked twice - on the basis of their proportion of high confidence ratings and on the basis of the magnitude of their interrater reliability coefficients. Then a Spearman Rho rank correlation was computed on the two sets of rankings to obtain a measure of the degree of relationship between confidence and reliability.

Coder Agreement as a Function of Coder Experience

In order to examine the the possible effect of coder experience on coder agreement, the percentage of overall agreement (viz., across 69 variables on the first coding form) obtained on the 49 cases in the combined reliability sample was regressed on the coding sequence followed by both primary coders.

Agreement Rates for Three Coders

The percentages of overall agreement (i.e., across 69 variables) obtained by Coders A and C and by Coders B and C were compared to the percentage of overall agreement between Coders A and B on three cases from the second reliability sample. Because only three cases were available from Coder C, no other statistical comparisons were made.

Coder Agreement as a Function of Report Difficulty

To assess whether coder judgment of the overall difficulty of coding a report was related to the overall percentage of exact agree-

ment between coders, these two measures were correlated using Pearson r. Because this variable was added later, only the last 20 cases from the second reliability samples were used in its computation.

Reduction of Multiple Ratings to Single Scores

It was necessary to combine the dual ratings made on the 55 trait variables in the 49 cases of the reliability sample before further analyzing the data. On an odd/even case basis, the 55 ratings made by one or the other coders were selected. This method was chosen after determining that it correlated highly with another possible approach (viz., taking the mean of the two coders' ratings). (The two methods were correlated (r = .86) using coders' ratings on the variable which showed the greatest coder effect, viz., need for power.) In those cases where one coder failed to give a rating, the rating of the other coder was used. The variables which were redefined and re-anchored after the first sample check of intercoder agreement (n = 24) were subsequently recoded as missing.

Empirical Relevance of Traits to Psychologists

Coder's confidence ratings were used to ascertain whether the personality characteristics selected a priori were in fact representative of the traits explicitly used by psychologists in their reports. It was important to ascertain not only the relevance of the traits in describing the aggregate population of managers, but, also, the relevance of the traits to subgroups of this population defined on the job category variables. In order to empirically assess trait relevance, traits were ranked according to their proportion of high coder confidence ratings. The entire sample (n = 450) of cases was used for

this purpose. Chi square was used to examine the relationship of high versus lower confidence ratings across subgroups of managers categorized along the following dimensions: gender; supervisory responsibility; level of authority; and job function. Traits demonstrating differential relevance ($\underline{p}$ < .05) across subgroups were retained for subsequent factor and regression analyses irrespective of the proportion of its ratings made with high confidence.

Final Specification of the Predictor Variable Set

Both the final estimates of intercoder reliability and the empirical relevance of the traits to the psychologists writing the reports were considered in making a final determination of the trait variables to be retained for subsequent analytic treatment. Thus, a variable was considered suspect and likely to be dropped if all of the following were true: first, it was rated with high confidence in a very small proportion of the total sample of cases (e.g., less than one-third); second, it did not show differential relevance to subgroups of the research sample; and, third, its intercoder reliability was lower than .60.

Dimensional Reduction of Personality Predictors

Factor Analyses

In order to develop a set of personality scales that would have a simpler and less redundant structure than the original set of individual predictors, several different factor analyses of the ratings were done. Both Harmon's (1976) principal axis factoring (PAF) and Jöreskog and Lawley's (1968) maximum likelihood (ML) extraction techniques were planned. Because some correlation amongst factors was

expected, oblique, as well as orthogonal (Varimax), rotations of factor solutions were planned.

The final factor solutions were obtained using SAS (1982); however, earlier attempts to factor analyze the data using SPSS[x] (SPSS, 1983) resulted in a message that the matrix was "ill conditioned" (i.e., that squared multiple correlations could not be computed as initial communality estimates) and that the factor solution provided might be unstable. However, a principal components (PC) analysis (i.e., with unities in the diagonals) could be done without problem.

Initially, multicollinearity was suspected as the cause of the unstable factor solution in SPSS[x]. Therefore, a number of measures were taken in an effort to resolve this problem. In order to identify those variables that may have been a linear combination of others in the set with the aim of collapsing such variables, each of the 55 variables was in turn regressed on all other variables in the set. The fact that the largest $\underline{R}^2$ value was only .78 suggested that merely collapsing variables would not lead to a simple solution to the problem. This was indeed the case and reducing the set of variables to 40 (by collapsing variables with the highest multiple or bivariate correlations) still failed to produce a stable factor solution.

It was subsequently learned that a number of other problems operating together may have contributed to the ill conditioned matrix. Included among these was the relatively small sample to variable ratio (8 to 1), the insufficient discriminatory power of the five point scale ratings in relation to the large number of variables, as well as the

precision and/or algorithm used by SPSS[x] to invert the correlation matrix.

As a result of the initial difficulty using SPSS[x], serious questions were raised regarding both the number and composition of factors. To address these questions, a variety of approaches were taken. A nonparametric approach based on Kendall's tau beta was used to compute the intercorrelations among traits (see e.g., Veroff, Feld and Gurin, 1962, for a discussion of this approach). However, a factor analysis of the nonparametric correlations using the SPSS[x] program again resulted in an ill-conditioned matrix and an unstable factor solution. Nevertheless, the factors extracted from both the PAF and ML solutions with Varimax rotation (the Oblimin rotation failed to reach convergence) proved very similar to solutions based on Pearson product moment correlations.

Number of factors. Several criteria were used in determining the number of factors to extract.[2] First, the minimum eigenvalue or roots criterion was examined. This criterion involves retaining factors having eigenvalues greater or equal to 1.0 when unities are in the diagonal of the correlation matrix. When squared multiple correlations are in the diagonal, the criterion leads to extracting factors having eigenvalues greater than 0.0. However, Gorsuch (1974) and others (e.g., Stewart, 1981) have cautioned against sole reliance on

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[2]It was in pursuit of this goal that a switch to SAS (1982) was made and, serendipitously, it was discovered that a stable factor solution could be obtained using the SAS factor analysis programs. Thus, final factor solutions were obtained using SAS.

the roots criterion when large numbers of variables (e.g., greater than 40) are involved.

The application of Cattell's (1966) scree test, in addition to the roots criterion, has been recommended by a number of authorities (e.g., Cattell, 1978: Gorsuch, 1974; Harman, 1976). The scree test involves plotting the eigenvalues and determining the number of factors just prior to the point where the eigenvalues begin to level off forming a straight line with an almost horizontal slope (Kim & Mueller, 1978). Although this procedure is not quite as simple and straight forward as it may at first appear, it is a useful procedure for determining the minimum number of factors to retain (Stewart, 1981).

Another approach which was taken to evaluate the appropriate number of factors was the large sample chi-square test associated with the maximum likelihood (ML) method of extracting factors. In this statistical approach, residual variance is tested for significance after subtracting the reproduced correlation matrix from the original correlation matrix. The procedure involves repeatedly specifying the extraction of an additional factor until there is a non-significant change in chi-square. Some major limitations of this approach have been noted (see e.g., Gorsuch, 1974; Kim & Mueller, 1982 for critiques). One problem with this approach is that it tends to result in the extraction of a large number of factors which, although statistically significant, are uninterpretable and of trivial importance. Furthermore, the problem increases with sample size and large numbers of variables. Also, ML is susceptible to Heywood cases, an anomaly that may occur in the iterative process of determining communalities

(SAS, 1982). Despite these shortcomings, the chi-square test is useful in determining the upper bounds of the number of factors.

The chi-square values and degrees of freedom obtained from the ML solutions for varying numbers of factors were also used to assess the best fitting model. More specifically, the Tucker-Lewis coefficient (T-L) was computed for successive numbers of factors. This measure of relative fit reflects the ratio of the amount of variance accounted for by a model to the amount of total variance (see Tucker & Lewis, 1973; Bryant & Veroff, 1984). The T-L coefficient approaches unity as the fit of the model improves.

The default criterion used by SAS (1982) to determine the number of factors to extract when performing an exploratory factor analysis is based on the proportion of common variance accounted for by the retained factors using the prior communality estimates. Although lower values may be specified, the default value for ceasing to extract factors is 100%.

In the present study, all of the above criteria were examined in order to determine the number of factors to retain. Other important considerations in determining whether to retain factors included their interpretability, as well as their ability to be replicated across different extraction and rotation methods and across different sub-samples of the total set of cases. Both a random split and a sample of cases in which low confidence ratings were omitted were factor analyzed to determine the similarity of factors which were extracted. In the next section, other considerations for determining the final set of personality dimensions will be presented.

Multiple Regression of Recommendation on Individual Predictors

The next step involved examining the standardized regression weights (betas) of the entire set of predictor variables to determine those given the greatest weight (i.e., statistically significant) in predicting psychologists' recommendations. In addition, the determination of the sign of each variable's relationship to the recommendation criterion was of interest because of its relevance to the next stage of analyses involving the construction of a dimensionally reduced set of predictor scales.

As a cross validation procedure, the recommendation criterion was also regressed on a random split of the pooled sample, a reduced sample omitting low confidence ratings, and on a few of the larger subgroups of the total sample of managers (viz., the marketing/sales subgroup, supervisors and nonsupervisors, and lower and middle managers). The variance accounted for (R^2), as well as the significance and sign of the regression weights, were examined for stability.

The Recommendation Criterion

A five level scale was used to measure the strength of psychologists' hiring recommendations.[3] Thirty-nine cases for which no explicit recommendation was stated in the report were coded as missing. The recommendation criterion for the remaining 411 cases was recoded as follows: (1) Not recommended, and candidate limitations are

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[3]In order to employ a criterion variable that would permit the greatest amount of variance to be accounted for by the trait variables, several approaches were empirically compared for defining the psychologists' hiring recommendation. Two through five level definitions of the hiring recommended were examined, as was a logistic regression procedure (see SAS Institute, Inc., SUGI Supplemental Library User's Guide, 1983).

emphasized; (2) Not recommended, however, candidate would be good for some other position; (3) Recommended with reservations or qualifications; (4) Recommended, and candidate demonstrates both strengths and developmental needs; (5) Recommended, and the report writer specified that this was a highly qualified candidate who was well suited for the position in question.[4]

Final Set of Factor-based Personality Dimensions

The intent in factor analyzing the characteristics rated from psychologists' reports was not so much to derive the most parsimonious structure underlying these ratings, but rather to determine a simpler structure which still retained sufficient complexity to assess any differential decision strategies of psychologists. Therefore, the next stage involved the development of a set of personality scales based, not only on the dimensional structure of the ratings, but on additional considerations, as well.

One important consideration used in developing scales was that variables comprising a scale should have a similar directional relationship with the recommendation criterion as determined from the multiple regression analysis of the individual traits in the pooled sample of managers. The decision was made to split clusters of variables loading on the same factor into two scales when they indicated different relationships with the recommendation criterion. Although an optional approach could have been taken which involved retaining both positive and negative variables on the same factor by

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[4]The manner used to collapse the original coding categories of the recommendation is shown in Appendix F.

reverse scoring those which were negatively related to the criterion, this choice was rejected. The primary reason for this lay in the speculation that clusters of variables having different directional relationships with the criterion in the total sample of managers might have similar directional criterion relationships within subgroups of the management population (or vice versa).

To determine empirically whether this might be the case, the recommendation criterion was regressed on several adaptations of the factor based model for each of several subdivisions of the total sample considered separately (viz., males/females; supervisors/nonsupervisors; lower/middle/top managers; marketing & sales/human resources/research & development/finance & accounting/production & manufacturing/general management). Because of the independence of these subgroups, no cross group comparisons could be made; however, the sign and significance of the regression coefficients of the personality scales within each subgroup considered separately provided clues for determining the final set of scales to use in the subsequent hierarchical regression analyses. More specifically, clusters of variables were retained in a separate scale when their regression coefficients in different subgroups indicated different directional relationships to the criterion. On the other hand, if a scale was not significantly related to the recommendation of candidates in any of the subgroups, it was dropped as a separate scale and the variables comprising it returned to the original factor based scale.

Several other bases were used in deciding on the final personality scales. One pertained to the hypothesized relevance of the scales

to subgroups of the manager population. Another concern was to develop a set of scales that would approximate as closely as possible the variance accounted for (R^2) in the recommendation criterion that the original set of individual predictor variables accounted for. In addition, the internal consistency (Cronbach's alpha) of the scales was considered in assessing their value as personality predictor indices.

Scale scores were derived by computing an unweighted average of the values of variables comprising the scales. A rather extensive literature has shown that unit weighting of variables does not differ appreciably from optimal weighting methods (e.g., Dawes, 1979; Green, 1977; Tellegen et al, 1982).

Comparison of Factor-based and Psychologists' A Priori Models

Scales were developed based on the a priori five dimensional framework used by psychologists to structure their discussions of candidate characteristics. Scale scores were similarly computed by obtaining an unweighted average of the values of variables comprising each scale. Both the scale reliabilities (Cronbach's alpha) and ability of the set of five scales to account for variance (R^2) in their recommendation decisions were compared to the scales of the empirically derived model.

Psychologists' Recommendation Policies

The ultimate purpose of deriving a dimensionally reduced set of personality predictors was to determine psychologists' policies in making recommendations regarding the suitability of candidates for management jobs. The standardized regression weights (betas) of the linear regression model were used to assess the relative importance of

these dimensions in psychologists' recommendations for the pooled management candidate sample. However, it was further predicted that psychologists' policies were moderated by their consideration of the type of jobs for which candidates were evaluated. To empirically test this hypothesis, a hierarchical multiple regression strategy was employed in which sets of variables were entered sequentially to determine the significance of changes in variance-accounted-for (R^2) in the recommendation criterion (see Cohen & Cohen, 1975, for a discussion of this procedure). More specifically, in order to examine the moderating effects of each of the job dimensions in turn (viz., supervisory requirements, job level, and job function), four sets of variables were hierarchically tested for the significance of change in R^2. A more detailed description of these four sets and the steps involved in hierarchically entering them into the regression analysis follows.

The first set of variables that was entered (designated Set D) were the demographic variables of age (d_1) and gender (d_2).[5] Although it was not expected that Set D would account for a significant proportion of variance in the recommendation criterion (indeed, it should not), this set was treated as a set of covariates, namely, a set of variables to be statistically controlled by a partialing procedure while studying the effects of the subsequent sets of variables.

The second step involved entering the entire set of personality dimensions (designated Set P). The scales comprising Set P which were simultaneously entered at step 2 were designated p_1, p_2, ..., p_k. It

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[5]Gender was entered as a dichotomous variable coded 0 or 1.

was expected that a sizable and highly significant change in R^2 would result. In the event that the incremental change in the multiple correlation squared going from step 1 to step 2 was significant based on the overall F-test ($p < .05$), the magnitude and significance of the standardized regression coefficients of the separate personality dimensions (p_1-p_k) within Set P were to be examined. Thus, Fisher's protected t-test procedure was employed for examining the significance of multiple single effects.

The third set which was entered hierarchically was the job dimension under question. This step and the next were separately repeated for each of the three job dimensions examined in this study. The supervisory/nonsupervisory dichotomy (s_1, dummy coded 0 or 1) was designated Set S; the job level trichotomy (l_1, l_2, effects coded) was designated Set L; and, the set of seven job functions (f_1 to f_6, effects coded) was designated Set F.[6] Because candidate membership in any categories of these sets was not expected to affect psychologists' recommendations when considered alone (i.e., as main effects), no change in the multiple correlation squared (R^2) was predicted with the inclusion of Sets S, L, or F on step 3 of the hierarchical regression procedure. Nevertheless, the job dimension set was included so as to partial out any variance-accounted-for (however trivial) before

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[6]Effects coding was selected as the most appropriate of several methods possible for representing and interpreting the nominal scales of the job dimensions because the focus in this investigation was on comparing the model of the psychologists' decision policies for a given subgroup with the model applicable to the pooled set of job categories. Furthermore, as Cohen and Cohen (1975) have noted, the raw-score regression coefficients of effects coding have the desirable property of independence from varying subgroup sample proportions.

considering the variance in the recommendation criterion at the next step which could be attributed to an interaction between sets of personality and job dimensions.

The fourth and final step in the hierarchical regression procedure involved an examination of the change in R^2 that would result from the inclusion of a set of the cross products of personality dimensions and one of the job dimensions (e.g., Set S). Thus, when the moderating effects of the supervisory requirements of jobs were examined, the Set P X S was entered and the individual variables constituting the set were carried by the cross products of the components of Sets P and S (viz., p_1s_1, p_2s_1, ..., p_ks_1).

Steps 3 and 4 were separately repeated when examining the moderator effects of job level and job function. Thus, three separate hierarchical regression analyses were done and are summarized as follows:

Analysis I: Moderating effects of supervisory requirements

      Step 1. Enter Set D (d_1 = age, d_2 = gender, dummy coded)

      Step 2. Enter Set P (p_1, p_2, ..., p_k = personality scales)

      Step 3. Enter Set S (s_1 = supervisory requirement, dummy coded 0 or 1)

      Step 4. Enter Set P X S (p_1s_1, p_2s_1, ..., p_ks_1 = cross products of personality scale scores and supervisory requirements of job, effects coded)

Analysis II: Moderating effects of job level

      Step 1. Enter Set D (d_1 = age, d_2 = gender, dummy coded)

      Step 2. Enter Set P (p_1, p_2, ..., p_k = personality scales)

Step 3. Enter Set L (l_1, l_2 = job level, effects coded)

Step 4. Enter Set P X L (p_1l_1, p_2l_1, ..., p_kl_1, p_1l_2, p_2l_2, ..., p_kl_2 = cross products of personality scale scores and job level, effects coded)

Analysis III: Moderating effects of job function

Step 1. Enter Set D (d_1 = age, d_2 = gender, dummy coded)

Step 2. Enter Set P (p_1, p_2, ..., p_k = personality scales)

Step 3. Enter Set F (f_1, f_2, ..., f_6 = job functions, effects coded)

Step 4. Enter Set P X F (p_1f_1, p_2f_1, ..., p_kf_1, p_1f_2, p_2f_2, ..., p_kf_2, ..., p_kf_6 = cross products of personality scale scores and job functions, effects coded)

Interpretation of Significant Single Effects

Any significant main effects on the personality scale variables could be interpreted as indicating those characteristics important for candidates' being recommended for any type or management job. However, information regarding the differential importance of these personality dimensions to recommendations made for specific subgroups of manager candidates were derived from an examination of the single interaction effects comprising Step 4 in each analysis. As noted by Cohen and Cohen (1975) the test for the significance of the difference between or among the regression coefficients from independent samples (as is the case with the management subgroups) "can be accomplished routinely as a test of significance of an interaction" (p. 53).

Despite the fact that Fishers protected t test procedure was employed and none of the single effects were to be evaluated for significance unless the overall F-test associated with the incremental variance accounted for by Step 4 was significant, the increasingly large number of single effects to be tested (particularly, after entering Set P X F) could have presented an error rate problem. Therefore, after the set of personality scales was determined, a priori hypotheses were formulated regarding the likely relationship of single effects to the recommendation criterion. Although these hypotheses were established on the basis of theoretical considerations and prior research findings (see Chapter 2), they were not specified until after the set of personality scales was determined.

Two types of expectations were specified. Predictions were made regarding which of the main effects for the personality scales would be important across all subgroups of the manager candidate population. Furthermore, specifications were made regarding which personality scales were expected to show a conditional relationship to the recommendation criterion as a function of type of management subgroup. However, in order to present a complete model of the personality scales found to be important either to all management jobs or to specific categories of management jobs, all significant single effects (main and interaction, hypothesized or not) were evaluated.

CHAPTER IV

INTERCODER AGREEMENT

Agreement on All Variables Excluding Psychological Traits

The coding of a number of variables required little more than the recovery of information from either the report or questionnaire. As expected, coder agreement on these variables was not a problem. The correlation (Pearson r) between Coders A and B across the 49 cases of the combined reliability samples was 1.00 for the following variables: case sequence number, office identification number, candidate identification number, intelligence test (PPT) score, and candidate age. For PPT form number, $r = .96$. The Phi coefficient for agreement in coding candidate sex was also 1.00.

Agreement between Coders A and B on several nominal scale variables was assessed using Cohen's kappa (Cohen, 1960). For the categories of job supervisory requirements and job functions on the 49 cases of the combined reliability samples, kappa was 1.00. Kappa was .935 for job level. For ethnic group membership, kappa was .79 across the entire 49 cases but 1.00 for the 25 cases in the second reliability sample.

Coder agreement on the criterion variable, psychologist's hiring recommendation, was determined in three ways. For the three category recommendation (no recommendation stated, not recommended, or recommended), kappa was .83 in the combined reliability sample ($n = 49$) and

1.00 in the second reliability sample ($\underline{n}$ = 25). For the original judgmentally based nine category coding of strength of recommendation (see Appendix F), kappa was .73 in the combined sample and .94 in the second reliability sample. After collapsing the nine category coding system into the recoded five level recommendation criterion (also shown in Appendix F) which was used in subsequent regression analyses , kappa was .80 across the 49 cases of the combined reliability samples; across the 25 cases of Sample 2, kappa was .94.

In the first check of coder agreement (Sample 1, $\underline{n}$ = 24) on coders' estimates of the proportion of content in each report which was covered by the 55 psychological trait variables, the Pearson $\underline{r}$ correlation was .01. In the second sample ($\underline{n}$ = 25) it was .60. However, in both samples these was considerable range restriction. In the first sample, the judged percentage of content covered ranged from 88 to 98 for Coder A and from 88 to 99 for Coder B. In the second sample check of coder agreement, the range for Coder A was 87 to 98 and for Coder B it was 86 to 98.

Across 20 cases of the second reliability sample, the correlation (Pearson $\underline{r}$) between coders regarding their judgment of the overall difficulty of coding each report was .76.

Coders' confidence ratings for each of the 55 traits were correlated using Pearson $\underline{r}$. The median $\underline{r}$ across all traits based on the combined reliability samples ($\underline{n}$ = 49) was .48.

Psychological Trait Variables

In order to assess the agreement between Coders A and B in rating the 55 trait variables, Pearson r coefficients of reliability were computed separately for two samples of reports (n_1 = 24 and n_2 = 25). The reliabilities obtained in these two samples are shown in Table 5, along with a measure of the change in correlations obtained in the second sample as determined by q, the difference in Fisher z' transformed values of each sample r (Cohen, 1977).

In Sample 1, the Pearson correlation coefficients (r) between Coders A and B on the 55 trait variables ranged from a high of .97 (general mental ability) to a low of .37 (emotional expressiveness). All coefficients were significantly different from zero at p < .05. In Sample 2, r ranged from .25 (verbal skills) to .99 (general mental ability). Only "verbal skills" failed to achieve significance (a result of a lack of variance and two extreme disagreements).

In general, the two samples did not differ significantly in terms of overall reliability. The mean of the reliability coefficients across all 55 traits was .70 in Sample 1 and .72 in Sample 2. Using the Fisher z' transformation of r in order to examine effect sizes, the difference (q = z'_2 - z'_1, Cohen, 1977) between samples was trivial. However, there was indication that the between sample retraining treatment which 24 variables received led to some improvement in coder agreement. Before retraining (Sample 1), the mean r of these 24 variables was .58; after retraining (Sample 2) the mean r was .70. The mean change in reliability as represented by q was .23 on these 24 variables, an effect size approaching the medium range as suggested by

Table 5

Change in Interrater Reliabilities Between Samples

via Fisher $\underline{z}'$ Transformation of $\underline{r}$

Variable	$\underline{r}^a$	$\underline{r}^b$	Change $(\underline{q} = \underline{z}'_2 - \underline{z}'_1)$
General mental ability	.966***	.987***	.48
Analytic reasoning	.572**	.775***	.38
Data gathering	.685***	.636***	− .09
Deliberation skill	.726***	.690***	− .07
Practical judgment	.721***	.671***	− .10
Detail orientation	.546**	.762***	.39
Abstract thinking	.857***	.885***	.12
Creativity	.868***	.836***	− .12
Intuition	.863***[c]	.709***	− .42
Long range thinking	.575**	.938***	1.06***
Curiosity	.678***[c]	.650***[c]	− .05
Intellectual focus[R]	.616**	.637***	.03
Mental agility	.756***	.864***	.32
Verbal skill	.752***	.253	− .72*
Results orientation[R]	.728***	.826***	.24
Adjustment & maturity	.870***	.671***	− .58
Emotional stability	.745***	.764***	.04
Adaptability to change	.588**	.614***	.04
Decisiveness[R]	.839***	.725***	− .30
Risk taking[R]	.767***[c]	.794***	.07
Tolerance for ambiguity	.815***	.785***	− .08
Tolerance for stress, pressure, & frustration	.839***	.811***	− .09
Emotional expressiveness[CR]	.374*	.763***	.61*
Optimism	.769***	.589**	− .34
Energy & drive	.862***	.909***	.52
Perseverance[C]	.413*	.742***	.52
Initiative	.764***	.786***	.05

Table 5 (continued)

Independence[R]	.774***	.561**	– .40
Need for autonomy	.695***	.787***	.21
Need for advancement	.822***	.390*	– .75*
Need for power/dominance[R]	.587**	.545**	– .06
Interpersonal skills	.848***	.616**	– .53
Social skill/facility	.796***	.682***	– .26
Affiliativeness	.686***[c]	.742***	.11
Assertiveness[R]	.813***	.754***	– .15
Persuasiveness	.452*[c]	.324*	– .15
Insight into others	.860***	.859***	– .00
Interpersonal flexibility	.780***	.774***	– .02
Listening/responding skills	.789***	.693***	– .22
Respect for others[R]	.697***	.693***	– .01
Insight into self	.862***	.864***	.01
Self confidence[R]	.463*[c]	.857***	.78*
Openness to negative feedback	.749***[c]	.769***	.05
Commitment to self–development	.570**[c]	.860***	.65*
Personal integrity[C]	.518**	.762***	.43
Commitment to excellence[CR]	.457*	.642***	.27
Administrative skills	.445*	.768***	.54
Planning/organizing skills	.759***	.865***	.32
Leadership ability	.559**	.754***	.35
Team orientation	.789***	.638***	– .31
Fairness/objectivity	.589**	.616**	.04
Ability to develop others	.689***	.697***	.02
Political savvy[CR]	.499***	.663***	.25
Organizational awareness	.743***	.814***	.18
Extra-organizational awareness	.591**	.503**	– .13

Note. Underlined variables are those which were subject to extensive coder retraining efforts between samples.
[a]n = 24. [b]n = 25. [c]missing value = 1.
[C]Variables redefined between samples due to coding complexities.
[R]Variables recoded to eliminate ratings of 6 (excessive).
*p <.05. **p <.01. ***p <.001.

Cohen (1977).[5] For the 31 variables not subjected to retraining treatment between samples, the mean $\underline{r}$ in Sample 1 was .79 and .73 in Sample 2. In terms of Cohen's (1977) effect size index, $\underline{q}$, the mean decrease of -.07 across these 31 variables represents a trivial change in reliabilities between samples. Despite an inability to totally rule out regression towards the mean as a source of overall improvement in the retrained variables, the significance of the changes that occurred between samples on these variables was examined. To do so, distinctions were made regarding the nature of the between-sample coder retraining treatments which subsets of these variables received.

Recoded Variables

Twelve variables (marked with a superscript R in Table 5) which initially had been given ratings of 6 in Sample 1 were recoded because of coders' expressed difficulties in differentiating between very high and excessive levels of a trait and, also, because an excessive level on one trait typically led to a low rating on another trait. Of these 12 variables, seven had reliabilities higher than .60 in Sample 1 after recoding and did not receive any other retraining treatment. These seven recoded traits and their changes in terms of $\underline{q}$ between Samples 1 and 2 are as follows: intellectual focus (.03); results orientation

[5]Cohen (1977) operationally defined the size of a difference between two correlation coefficients via the Fisher $\underline{z}'$ transformation of $\underline{r}$ using the following values of $\underline{q}$ ($\underline{z}'_2 - \underline{z}'_1$): $\underline{q}$ = .10 represents a small effect size; $\underline{q}$ = .30 represents a medium effect size; $\underline{q}$ = .50 represents a large effect size. Because the statistical power associated with the sizes of the samples ($\underline{n}_1$ = 24 and $\underline{n}_2$ = 25) used to assess change in reliabilities in this study was so low (approximately .25), Cohen's conventions were used to determine the magnitude of change effects. According to Cohen (1977), each sample would have required 66 cases to detect significance of a $\underline{q}$ value of .50 at power = .80 and alpha = .05, two-tailed.

(.24); decisiveness (-.30); risk taking orientation (.07); independence (-.40); assertiveness (-.15); and respect for others (-.01). The mean change on these seven traits was trivial (mean q = -.07). The other five recoded variables (viz., emotional expressiveness, need for power, self-confidence, commitment to excellence, and political savvy) were among seventeen traits discussed below (and underlined in Table 5) which were found to have interrater reliabilites lower than .60.

Basis of Differential Coder Calibration Strategies

Of the 17 variables having reliabilities less than .60, five variables seemed low due to coding complexities. Included among these complexities were ambiguous trait definitions, severely skewed distributions of ratings, or lack of variance. The median percentage of high confidence ratings given for these variables was 70 per cent and low interrater agreement appeared to be constant across confidence levels. Twelve variables appeared low primarily as the result of deficient reporting. The median percentage of ratings made with high confidence on these variables was 49.5 per cent and interrater agreement appeared higher when coders were highly confident of their trait ratings.

As a consequence of the apparently different sources of unreliability, two different strategies were adopted to calibrate coder agreement. For those trait variables with low agreement across confidence levels (i.e., unrelated to deficient reporting), efforts were directed at improving the trait's definition and anchors, and then coders were retrained to use these refinements. However, for those traits whose ratings appeared related to report quality, retraining focused on the differential inference processes being used by coders to

make moderate level confidence ratings. In the next section, changes in agreement across samples for these two subsets of variables will be presented.

Variables with coding complexities. Five variables (super-scripted with a capital C in Table 5) were identified as having low coder agreement primarily as the result of coding complexities. The specific traits subjected to this between sample treatment included: emotional expressiveness; perseverance; personal integrity; commitment to excellence; and political savvy). Whereas, the mean r of these five variables was .44 in Sample 1, in Sample 2 the mean r was .73. This positive difference represents a medium to large effect size (q = .46).

Of the five variables identified as having coding complexities in Sample 1, the following showed improvement in Sample 2. Emotional expressiveness improved significantly to .763 from an r of .374. Integrity went from r = .518 to r = .762. Perseverance improved from an r of .413 to an r of .742. Political savvy increased in reliability from .499 to .663. However, the reliability coefficient for persua-siveness decreased from .452 to .324.

Deficiently reported variables. Twelve other variables of the 17 with r < .60 appeared to have low coder agreement primarily as the result of deficient reporting. The mean r of these 12 variables in Sample 1 was .54; after retraining the mean r was .69. The mean change in r in terms of q values was .32, suggesting an effect size within the medium range.

The effect sizes of seven of the 12 deficiently reported variables suggested improvement in reliability to a medium or large

degree, while only two decreased in agreement a small amount. Analytic reasoning improved to a moderate degree (q = .38), going from r = .572 to r = .775. Detail orientation increased in r to .762 from .546. Long range thinking significantly improved to r = .938 from an r of .575 (q = 1.06). Self-confidence was significantly higher in Sample 2, showing an increase in r from .463 to .857 (q = .78). Commitment to self-development also showed a significant improvement to r = .860 from r = .570 (q = .65). Although not statistically significant, administrative skills showed a large improvement as the result of retraining (q = .54), improving to r = .768 from an r = .445 in the first sample. Leadership ability showed a medium increase from r = .559 to r = .754 (q = .35). The other five variables and their q values are as follows: adaptability to change (.04); need for power (-.06); persuasiveness (-.15); fairness (.04); and extra-organizational awareness (-.13).

Distributional Characteristics of the Trait Ratings

In general, the ratings were somewhat skewed but still within the bounds of a normal distribution of ratings. Some skew could be expected because candidates were a preselected group and approximately 80% were subsequently recommended for hire. Of greater concern for the purposes of assessing intercoder agreement was the attenuation of correlation that would result from a lack of variance in the ratings.

The means and standard deviations of the ratings made by Coders A and B in Samples 1 and 2 are shown in Table 6. On a five point rating scale (applicable to all the traits except the first, general mental ability) the ideal distribution might have a mean of approximately 3.0 and a standard deviation of 1.0. Some variables may be

Table 6

Means and Standard Deviations of Coders A and B

on the Second Reliability Sample

Variable	Coder	Sample 1 Mean (s.d.)	Sample 2 Mean (s.d.)
General mental ability	A	4.71 (1.12)	5.28 (1.24)
	B	4.71 (1.04)	5.32 (1.22)
Analytic reasoning	A	3.50 (1.22)	3.84 (.99)
	B	3.62 (.97)	3.68 (.80)
Data gathering	A	3.46 (1.10)	3.68 (.99)
	B	3.29 (1.08)	3.52 (1.00)
Deliberation skill	A	3.58 (.93)	3.76 (1.01)
	B	3.79 (.83)	3.56 (.92)
Practical judgment	A	3.58 (.83)	3.80 (.65)
	B	3.96 (.62)	3.80 (.58)
Detail orientation	A	3.54 (.88)	3.80 (1.00)
	B	3.83 (1.01)	3.64 (1.00)
Abstract thinking	A	3.37 (1.10)	3.68 (.95)
	B	3.37 (1.28)	3.64 (.95)
Creativity	A	2.92 (1.21)	3.28 (1.14)
	B	3.04 (1.16)	3.44 (.96)
Intuition	A[b]	2.63 (1.44)	3.16 (1.31)
	B[b]	3.04 (1.19)	2.92 (.95)
Long range thinking	A[a]	2.54 (1.25)	2.88 (1.27)
	B[a]	3.37 (1.10)	3.00 (1.19)
Curiosity	A	3.46 (.98)	3.76 (.72)
	B	3.61 (.94)	3.83 (.82)
Intellectual focus	A[a]	3.37 (1.21)	3.00 (1.04)
	B[a]	4.21 (.88)	3.60 (.82)
Mental agility	A	3.04 (1.00)	3.68 (.80)
	B	3.58 (1.06)	3.68 (.75)
Verbal skill	A	3.58 (1.18)	3.88 (.73)
	B	3.67 (.87)	3.92 (.40)
Results orientation	A	3.75 (1.07)	3.80 (.96)
	B	3.58 (.97)	3.72 (.98)
Adjustment & maturity	A	3.13 (.85)	3.08 (.86)
	B	3.46 (.98)	3.20 (.76)
Emotional stability	A	3.46 (1.02)	3.28 (.84)
	B	3.71 (.86)	3.16 (.90)

Table 6 (continued)

Adaptability to change	A	3.04 (1.27)	3.28 (1.06)
	B	3.17 (1.27)	3.52 (.92)
Decisiveness	A	3.33 (1.01)	3.32 (.80)
	B	3.50 (.98)	3.48 (.87)
Risk taking	A	2.65 (1.27)	3.40 (.91)
	B	2.96 (1.27)	3.16 (.94)
Tolerance for ambiguity	A	2.79 (1.18)	3.68 (.95)
	B	2.92 (1.25)	3.56 (.87)
Tolerance for stress, pressure, etc.	A	3.08 (1.18)	3.28 (1.06)
	B	3.21 (1.22)	3.20 (.71)
Emotional expressiveness	A	2.83 (1.17)	3.16 (1.11)
	B	2.67 (.96)	3.12 (1.01)
Optimism	A	3.00 (.93)	3.60 (.71)
	B	3.37 (.97)	3.60 (.50)
Energy & drive	A	3.79 (1.10)	3.92 (.76)
	B	4.13 (1.03)	4.04 (.79)
Perseverance	A	4.17 (.76)	3.48 (.96)
	B	4.04 (.81)	3.44 (.92)
Initiative	A	3.58 (1.14)	3.64 (1.04)
	B	3.83 (.82)	3.56 (.82)
Independence	A	3.21 (1.18)	3.68 (.90)
	B	3.21 (1.28)	3.20 (.96)
Need for autonomy	A	2.83 (1.31)	3.32 (1.11)
	B	2.87 (1.08)	2.96 (1.02)
Need for advancement	A	3.83 (.76)	3.72 (.98)
	B	4.00 (.83)	3.88 (.78)
Need for power/dominance	A[a]	3.17 (1.24)	3.04 (.98)
	B[a]	3.75 (.90)	3.48 (.82)
Interpersonal skills	A	3.58 (.97)	3.44 (.71)
	B	3.63 (1.01)	3.44 (.87)
Social skill/facility	A	3.33 (1.13)	3.64 (.95)
	B	3.75 (1.11)	3.48 (.92)
Affiliativeness	A	3.38 (1.06)	3.48 (.65)
	B	3.78 (.85)	3.56 (.71)
Assertiveness	A	3.08 (1.32)	3.56 (.65)
	B	3.33 (1.27)	3.76 (.88)
Persuasiveness	A	3.21 (1.18)	3.42 (.97)
	B	3.33 (1.01)	3.20 (1.04)
Insight into others	A	3.08 (1.22)	3.28 (1.21)
	B	3.17 (1.40)	3.12 (1.13)
Interpersonal Flexibility	A	2.79 (1.18)	3.24 (1.01)
	B	3.33 (1.31)	3.24 (1.20)
Listening/responding skills	A	3.33 (1.13)	3.40 (.87)
	B	3.25 (1.07)	3.20 (.76)

Table 6 (continued)

Respect for others	A	3.17 (1.43)	3.76 (.83)
	B	2.96 (1.27)	3.68 (.80)
Insight into self	A	2.75 (1.03)	3.04 (1.02)
	B	3.08 (1.10)	3.00 (1.04)
Self-confidence	A	3.46 (1.06)	3.72 (.79)
	B	3.74 (.96)	3.56 (.92)
Openness to negative feedback	A	2.91 (1.28)	3.08 (1.19)
	B	3.46 (.98)	2.96 (1.10)
Commitment to self-development	A[b]	2.61 (1.16)	3.32 (1.11)
	B[b]	3.58 (1.10)	3.32 (1.07)
Personal integrity	A	4.17 (.82)	3.92 (.81)
	B	4.04 (.91)	3.96 (.73)
Commitment to excellence	A	4.25 (.90)	3.96 (.84)
	B	4.58 (.58)	4.00 (1.08)
Administrative skills	A	4.08 (.78)	3.24 (1.13)
	B	4.13 (.85)	3.20 (1.00)
Planning/organizing skills	A	3.71 (1.08)	3.60 (1.19)
	B	3.92 (.97)	3.48 (1.08)
Leadership ability	A	2.96 (1.08)	2.92 (1.19)
	B	2.92 (.93)	2.96 (1.02)
Team orientation	A	3.13 (1.26)	3.76 (1.05)
	B	3.54 (1.02)	3.40 (1.08)
Fairness/objectivity	A	3.21 (.78)	3.36 (.70)
	B	3.38 (.77)	3.64 (.70)
Ability to develop others	A	2.71 (1.08)	3.24 (1.16)
	B	2.92 (1.25)	3.20 (1.12)
Political savvy	A[a]	2.38 (1.21)	2.40 (1.00)
	B[a]	3.22 (1.13)	2.76 (.78)
Organizational awareness	A	2.83 (1.34)	3.20 (1.26)
	B	3.38 (1.24)	3.16 (.94)
Extra-organizational awareness	A	2.79 (1.25)	3.24 (.93)
	B	3.17 (1.05)	3.16 (.90)

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[a]Identical superscripts adjoining coder designations (A and B) indicate variables showing a significant univariate main effect for Coder at $p < .001$ (with 1,40 df).
[b]Univariate Coder X Sample interaction effect significant at $p < .001$ (1,40 df).

pointed to as having departed from this standard to a greater degree, particularly with respect to the attenuating effects of the dispersion of their ratings on reliability. Of note is the low variation on the variable verbal skills in Sample 2 (for Coders A and B the s.d. = .73 and .40, respectively) suggesting that the significant drop in reliability on this variable (q = -.72) was in part due to attentuation. In Sample 2 the mean r was .63 on six variables (viz., practical judgment, verbal skills, optimism, energy, affiliativeness, and fairness) for which the dispersion of ratings was low for both coders (s.d. < .80). Thus, while low variation had some attenuating effects on agreement, its effect appeared to be minimal for most variables. Also, low variation did not necessarily result in low reliability (e.g., r for energy in Sample 2 was .91 despite low variation).

Coder and sample differences. Visual inspection of the distributional characteristics of the trait ratings made by Coders A and B suggested that Coder B was generally more lenient in her ratings than Coder A. During the retraining period between samples, this tendency was discussed by coders with the aim of reducing any leniency bias. Therefore, it was important to ascertain whether a coder effect across the 55 trait variables was operative. In addition to the question of a possible coder effect, it was also of interest to determine whether the two samples differed in their distributional characteristics across all traits. The finding of a nonsignificant sample effect was an important factor in deciding whether to combine samples to obtain final reliability estimates and to determine the effect of coder confidence on reliability (see below).

In order to statistically examine the significance of a within subjects coder effect, a sample effect, or a coder by subject interaction effect, a doubly multivariate analysis of variance (MANOVA) was attempted. However, due to the multicollinearity amongst the trait ratings, accentuated by the large number of variables (55) and insufficent number of valid cases (42), no MANOVA solution (and, therefore, no overall F tests) could be obtained. Thus, the univariate F tests (with 1,40 degrees of freedom) for main and interaction effects were examined for each of the 55 traits. Because of the increased possibilities of making Type I errors when making multiple comparisons, an alpha level of .001 (i.e., .05 divided by 55) was used as a more stringent criterion for testing the significance of each of these effects (see e.g., Cook & Campbell, 1979, for a discussion of the error rate problem). In addition to the means and standard deviations of each trait's ratings, the significance of the univariate F tests for the main effects for coder and the coder by sample interaction effects has been indicated in Table 6. None of the 55 sample differences were significant, lending support to the subsequent decision to combine reliability samples (see below). Of the 55 variables, four variables (viz., long range thinking, intellectual focus, need for power, and political savvy) indicated significant coder effects. In all instances Coder B was more lenient than Coder A; however, differences between coders were less in Sample 2 than in Sample 1. Two variables (viz., intuition and commitment to self-development) manifested significant coder by sample interaction effects. In both instances Coder B's greater leniency of ratings on Sample 1 shifted in Sample 2 with coders

Table 7

Interrater Reliabilities (Pearson r) for Coders A and B
Under Varying Levels of Confidence

Variable	Condition		
	I[a]	II[b]	III[c]
	r(n)	r(cum %)	r(%)
General mental ability	.979(49)	.979(100%)	.993(94%)
Analytic reasoning	.652(49)	.661(98%)	.695(65%)
Data gathering	.666(49)	.671(98%)	.652(33%)
Deliberation skill	.685(49)	.685(100%)	.741(71%)
Practical judgment	.663(49)	.663(100%)	.625(55%)
Detail orientation	.638(49)	.638(100%)	.776(76%)
Abstract thinking	.868(49)	.867(98%)	.898(73%)
Creativity	.856(49)	.856(96%)	.905(53%)
Intuition	.761(48)	.776(90%)	.922(44%)
Long range thinking	.729(49)	.730(94%)	.918(33%)
Curiosity	·672(47)	.647(91%)	.780(38%)
Intellectual focus	.636(49)	.636(91%)	.647(31%)
Mental agility	.765(49)	.764(98%)	.907(43%)
Verbal skill	.643(49)	.632(94%)	.676(69%)
Results orientation	·773(49)	.781(98%)	.752(63%)
Adjustment & maturity	.768(49)	.768(100%)	.780(53%)
Emotional stability	.744(49)	.744(100%)	.837(53%)
Adaptability to change	.602(49)	.673(94%)	.756(33%)
Decisiveness	·789(49)	.793(98%)	.910(39%)
Risk taking	·760(48)	.780(92%)	.974(38%)
Tolerance for ambiguity	.820(49)	.820(98%)	.959(27%)
Tolerance for stress, etc.	.807(49)	.807(100%)	.858(63%)
Emotional expressiveness	.584(49)	.591(98%)	.681(65%)
Optimism	.706(49)	.723(98%)	.951(31%)
Energy & drive	.871(49)	.869(98%)	.940(67%)
Perseverance	.658(49)	.653(98)	.707(53%)
Initiative	.758(49)	.653(98%)	.927(47%)

Table 7 (continued)

Independence	.676(49)	.676(98%)	.678(57%)
Need for autonomy	.728(49)	.724(96%)	.745(45%)
Need for advancement	.576(49)	.569(92%)	.780(47%)
Need for power/dominance	.568(49)	.570(98%)	.875(51%)
Interpersonal skills	.756(49)	.756(100%)	.855(51%)
Social skill/facility	.713(49)	.713(100%)	.745(84%)
Affiliativeness	.678(48)	.678(98%)	.694(80%)
Assertiveness	.798(49)	.803(98%)	.840(84%)
Persuasiveness	·385(48)	.419(96%)	.433(48%)
Insight into others	.850(49)	.857(98%)	.869(80%)
Interpersonal flexibility	.753(49)	.755(98%)	.892(53%)
Listening/responding skills	.752(49)	.742(98%)	.818(43%)
Respect for others	.719(49)	.724(98%)	.691(71%)
Insight into self	.847(49)	.847(98%)	.860(90%)
Self-confidence	.603(48)	.645(94%)	.691(71%)
Openness to negative feedback	.720(48)	.736(90%)	.853(52%)
Commitment to self-development	.651(48)	.651(96%)	.707(48%)
Personal integrity	.626(49)	.726(94%)	.760(55%)
Commitment to excellence	.565(49)	.564(98%)	.577(71%)
Administrative skills	.712(49)	.721(98%)	.890(57%)
Planning/organizing skills	.809(49)	.811(98%)	.826(82%)
Leadership ability	.667(49)	.667(100%)	.828(65%)
Team orientation	.665(49)	.664(98%)	.698(61%)
Fairness/objectivity	.607(49)	.602(42%)	.935(18%)
Ability to develop others	.695(49)	.715(92%)	.755(29%)
Political savvy	.548(49)	.641(69%)	.843(22%)
Organizational awareness	.743(49)	.813(69%)	.962(24%)
Extra-organizational awareness	.542(49)	.795(39%)	.500(3%)

Note. Underlined variables are those which were subject to retraining efforts after a check of the intercoder reliability of Sample 1.

aCondition I = All cases are included.
bCondition II = Only high and medium confidence cases are included.
cCondition III = Only high confidence cases are included.

distributing their ratings in a nearly identical manner in the second sample of cases.

Relationship of Coder Agreement to Coder Confidence

Samples 1 and 2 were combined (n = 49) in order to determine empirically whether coder agreement was related to deficient reporting (as suggested by coders' confidence ratings). Interrater reliabilities for all 55 trait variables were computed for three conditions of confidence (see Table 7). Condition I included all cases rated at any of the three levels of coder confidence. Condition II included only those cases where the trait was rated with at least moderate coder confidence. Condition III included only those cases rated with high coder confidence. As expected, interrater reliabilities were typically higher when coder confidence was high. The median r for the high confidence ratings (Condition III) was .82. However, when coder inferences were called for, reliabilities generally decreased to some extent. When both high and moderate confidence ratings were combined (Condition II), the median r was .72. The median reliability coefficient of .71 obtained for ratings made under all levels of confidence combined (Condition III) was only minimally lower.

Conceptual Distinctiveness of Coder Agreement and Coder Confidence

Although an association between coder confidence and coder agreement was suggested by the overall improvement in reliability under conditions of high confidence, the conceptual distinctiveness of confidence and reliability was also empirically supported. As Orwin and Cordray (1985) also found, coder agreement was neither guaranteed by high confidence nor precluded by lower confidence. A Spearman Rho rank

correlation ($\underline{n}$ = 49) between variables ordered by their proportion of high confidence ratings and by the rankings of their interrater reliability coefficients was only .22.

Another indication of the distinctiveness of confidence and reliability was obtained by obtaining the mean interrater $\underline{r}$ of six traits for which the agreement between coders on their confidence ratings was the lowest. Despite low agreement in coders' confidence in rating these six traits (mean $\underline{r}$ = .12), the average interrater reliability for the trait ratings themselves was .64.

Summary of Agreement on Trait Variables

The intercoder reliabilities ranged in the combined sample (n=49) from .385 (persuasiveness) to .979 (general mental ability). The median $\underline{r}$ for samples 1, 2 and both combined were, respectively, .743, .754, and .713 when all ratings (low to high confidence) were included. This compares quite favorably with the findings of intercoder reliability reported by other researchers rating trait variables from interview reports. As an example, Grant and Bray (1969), based on a rating of 18 variables from interview reports, obtained a median $\underline{r}$ of .72 for a noncollege sample of managers and a median $\underline{r}$ of .80 for a college graduate sample. Only reports which were deemed 'ratable' were included in the check of each variable's reliability. Thus, their reliability coefficients are more comparable to the high confidence reliabilities reported in this study.

Hilton and his associates (1955) reported intraclass correlation coefficients (corrected by the Spearman-Brown formula) ranging from .51 to .77 on five variables rated by two psychologists from the audit

files of 100 managers. DeNelsky and McKee (1969), using a set of 25 variables to form an overall impression (single rating) of each subject, obtained reliabilities on two groups of assessment reports of .63 and .66.

The highest reliability estimates were obtained by Dicken and Black (1965). They used Ebel's (1951, p. 412) analysis of variance technique to estimate the reliability of the composite rating of four psychologists on one general variable (potential) and seven global personality variables related to those used in the Office of Strategic Services assessment study (OSS Staff, 1948). On the seven variables (intelligence, soundness, drive, leadership, likeableness, responsibility, and cooperativeness), Dicken and Black (1965) obtained an average r_{kk} of .92. The average Pearson r for seven comparable variables (general mental ability, emotional stability, energy and drive, leadership, interpersonal skill, integrity, and team orientation) in the second sample check of reliability in this study was .80. Given that composite ratings are generally more stable, and that Pearson r is a more stringent test of reliability than the analysis of variance technique of estimating reliability, the reliabilities obtained on the trait variables in this study were generally quite comparable. With very few exceptions (e.g., persuasiveness and commitment to excellence), the reliabilities were considered to be of acceptable magnitude for use in subsequent factor and regression analyses.

Coder Agreement as a Function of Coder Experience

The percentages of both exact and close (i.e., within one rating point on the 55 trait variables) agreement across all 69 variables on

the first coding form were regressed on the sequence followed by Coders A and B to code the 49 cases of the combined reliability sample. Case sequence was the operational measure of coder experience. A highly significant linear trend ($p < .001$) was found for both exact and close agreement. Forty-five percent of the variance in exact coder agreement could be accounted for by the linear trend ($R^2_{linear} = .45$); however, the consideration of quadratic and cubic trends added significantly to the total variance accounted for ($R^2_{cubic} = .52$, $p < . 001$). Although the trend in close agreement was of lesser magnitude ($R^2_{linear} = .40$; $R^2_{quadratic} = .43$; $R^2_{cubic} = .44$), all were significant ($p < .001$).

The relationship between agreement rates and coder experience is presented graphically in Figure 1. For simplicity of presentation the 49 cases have been grouped into seven averaged sets (seven cases in each set). On the first seven cases, Coders A and B had an average exact agreement rate of 56.2%. Although the average percentage of agreement improves considerably in the next seven cases (65.2%), it remains relatively constant until 35 cases have been coded. After 35 cases, and again after 42 cases, agreement improves considerably. On the last seven of the 49 cases the average agreement rate (exact) was 81.2%.

Thus, training on a minimum of seven cases was necessary to bring coders to a moderate level of agreement; however, for higher coder calibration, a training sample in excess of 40 cases may have been required. As a consequence, the interrater reliabilities for the 55 trait variables may be underestimates of the agreement ultimately reached between coders.

Figure 1. Mean Percentage of Exact and Close Agreement Between Coders A and B as a Function of Coder Experience (i.e., case sequence, grouped).

Agreement Amongst Three Coders

Because only three cases from the reliability sample (the 25th, 27th, and 30th) were coded by Coder C (after the initial training cases), no statistical tests of agreement were computed. The mean percentage of agreement on these three cases was 60.9% between Coders A and C and 59.9% between Coders B and C. The average agreement rate between the primary coders (A and B) was somewhat higher (65.7%), a likely result of their greater experience using the coding frame.

Coder Agreement as a Function of Report Difficulty

Although coders demonstrated relatively high agreement (r = .76) on the difficulty of coding the last twenty reports included in the second reliability sample, their average assessment of report difficulty was not related to the percentage of exact agreement they obtained on these cases. The Pearson r correlation between mean difficulty and percentage of exact agreement was −.04.

CHAPTER V

RESULTS

Overview

A number of considerations led to the final determination of both the single and the scaled sets of traits which should be used as the personality predictors in the final examination of psychologists' recommendation policies. In the first section of this chapter, findings will be presented regarding the empirical relevance of the individual trait variables to the psychologist report writers (as inferred from coders' confidence in rating the traits). Trait relevance was examined, not only across all manager candidates, but also for subsets of candidates subdivided by gender and job type. If, in all instances, a trait was found lacking in relevance to the report writers, then its inclusion as a predictor measure in subsequent factor and regression analyses was considered inappropriate. Low intercoder reliability on such traits was considered as an additional reason for a trait's exclusion.

The second section of this chapter focuses on the preliminary factor and individual trait regression analyses which were conducted as a means of arriving at a final set of dimensionally reduced personality predictor scales. Finally, the results of the moderated (hierarchical)

regression analyses showing psychologists' recommendation policies will be presented.

Trait Relevance

The 55 personality traits, ordered according to their proportion of high confidence ratings, along with their final estimates (and ranks) of interrater reliability, are shown in Table 8. The percentage of high ratings made with high coder confidence ranged across the trait variables from 98% (general mental ability) to 13.9% (extra-organizational awareness), providing evidence that there was considerable variation in the explicit use of these trait variables by the report writers to describe the aggregate group of manager candidates. The median proportion of high confidence ratings was .62.

The trait extra-organizational awareness was rated with high confidence in only 13.9% of the cases. In addition, intercoder agreement (r) was only .54 on this variable. Similarly, the trait political savvy was rated with high confidence in only 29.6% of the cases and had an intercoder reliability quotient of only .55. Due to the apparent lack of relevance of these traits to psychologists writing reports, coupled with the failure of coders to achieve substantial agreement on them, a tentative decision was made to drop these two traits from subsequent analyses if they failed to show relevance to any subgroups of the candidate sample. This was also true for three other traits having a low percentage of high confidence ratings, although reliabilities were at more acceptable levels on these variables. The traits in question included the following: fairness/objectivity (31.8% high confidence, r =.61); optimism (36.9% high confidence, r =.71); and

Table 8

Personality Trait Variables Ranked According to the Proportion
of Cases Rated with High Confidence

Confidence Rank[a]	Variable	High Confidence Percentage	r[b]	r Rank
1	General mental ability	98.0	.98	1
2	Insight into self	90.2	.85	5.5
3	Social skill	87.1	.71	28
4	Insight into others	86.7	.85	5.5
5	Assertiveness	85.1	.80	10
6	Deliberation skills	84.2	.69	30.5
7	Affiliativeness	81.3	.68	32.5
8	Planning/organizing	81.0	.81	8.5
9	Detail orientation	78.7	.64	43
10	Analytic reasoning	78.2	.65	40.5
11	Abstract reasoning	77.6	.87	2.5
12	Commitment to excellence	76.5	.57	51.5
13	Emotional expressiveness	75.1	.58	49.5
14	Team orientation	73.3	.67	35.5
15	Perseverance	70.8	.66	38.5
16.5	Practical judgment	70.7	.66	38.5
16.5	Self-confidence	70.7	.60	47.5
18	Independence	70.4	.68	32.5
19	Verbal skills	69.2	.64	43
20	Energy & drive	69.0	.87	2.5
21	Results orientation	68.2	.77	13
22	Respect for others	67.8	.72	25.5
23	Commitment to self-development	65.2	.65	40.5
24	Emotional stability	64.9	.74	21.5
25	Personal integrity	64.2	.63	45
26	Need for advancement	64	.58	49.5
27	Interpersonal flexibility	62.0	.75	19.5

Table 8 (continued)

28	Need for autonomy	61.9	.73	23.5
29	Administrative skills	61.3	.71	28
30	Creativity	60.4	.86	4
31.5	Leadership skills	59.1	.67	35.5
31.5	Persuasiveness	59.1	.39	55
33	Intellectual focus	58.7	.64	43
34	Mental agility	58.3	.77	13
35	Tolerance for stress, etc.	57.2	.81	8.5
36	Listening/responding skills	54.9	.75	19.5
37.5	Openness to negative feedback	52.7	.72	25.5
37.5	Decisiveness	52.7	.79	11
39	Data gathering skills	52.1	.67	35.5
40	Maturity & adjustment	51.1	.77	13
41	Curiosity	50.8	.67	35.5
42	Long range thinking	50.4	.73	23.5
43	Adaptability to change	49.6	.60	47.5
44	Need for power/dominance	48.8	.57	51.5
45	Initiative	48.7	.76	16.5
46	Ability to develop others	48.4	.69	30.5
47	Risk taking	44.2	.76	16.5
48	Interpersonal skills	43.5	.76	16.5
49	Intuition	43.1	.76	16.5
50	Tolerance for ambiguity	39.0	.82	7
51	Organizational awareness	38.5	.74	21.5
52	Optimism	36.9	.71	28
53	Fairness/objectivity	31.8	.61	46
54	Political savvy	29.6	.55	53
55	Extra-organizational awareness	13.9	.54	54

Note. Cases rated with high confidence are those in which the psycho-
logical report made explicit reference to the variable being rated.
[a]The high confidence ranks are based on all cases ($N > 420$).
[b]Reliability coefficients are based on the combined reliability sample
($n = 49$).

organizational awareness (38.5% high confidence, r =.74). Evidence regarding the relevance of these and all other traits to subgroups of the candidate population will be presented next.

Relevance of Traits to Subgroups of the Candidate Population

To empirically determine whether explicit reference to traits varied over subgroups of managers, the frequencies of high (i.e., explicit) versus lower (i.e., inferential) confidence ratings were contrasted across subgroups of manager candidates categorized by gender, supervisory requirements, management level, and job function. These findings are presented separately below for each of the subgrouping dimensions.

Gender differences in trait relevance. Four of the 55 traits showed significant differences in the percentage of high confidence ratings that could be made for males and females. However, some caution must be taken in interpreting the significance of these effects; 2.75 tests out of 55 might be expected to be significant on the basis of chance alone (p <.05). A significantly higher percentage of males (52.5%) than females (35.8%) were rated with high confidence on long range thinking, $\chi^2(1, N =449) = 4.55$, p <.05. On mental agility, a greater percentage of females (73.6%) were rated with high confidence than were males (56.2%), $\chi^2 (1, N = 448) = 5.11$, p <.05. A higher percentage of females (83%) than males (68.6%) were rated on independence with high confidence, $\chi^2 (1, N = 448) = 3.98$, p <.05. Again, on commitment to self-development, females were rated with high confidence in a greater percentage of cases (79.2% as compared to 63.2% for males), $\chi^2 (1, N = 447) = 4.61$, p <.05.

Differences between supervisors and nonsupervisors in trait relevance. As shown in Table 9, ten traits showed differences in the extent to which psychologists explicitly described supervisors and nonsupervisors in their reports (as operationalized by the percentage of high confidence ratings). The number of significant effects (10) exceeds the number of tests (2.75) out of 55 that may be expected on the basis of chance alone. Also, five of the traits were highly significant (p <.01).

Six traits were used significantly more often to describe supervisors than nonsupervisors: deliberation skill, maturity and adjustment, leadership ability, fairness and objectivity, ability to develop others, and organizational awareness. Manager candidates in nonsupervisory jobs were more frequently described explicitly on the following four traits: optimism, initiative, independence, and, need for autonomy.

Trait relevance as a function of management level. Thirteen traits were found to be rated with high confidence differentially as a function of management level (see Table 10). On the basis of chance alone, fewer than three traits would be expected to show significant effects. Four traits showed highly significant (p <.001) differences in relevance across levels: deliberation skill, long range thinking ability, results orientation, and, ability to develop others. In all four cases, the percentage of high confidence ratings increased with level of management (i.e., from lower to top). Five traits indicated significant changes in trait relevance as a function of management level at p < .01: analytic ability, decisiveness, insight into others,

Table 9

Percentage of High Confidence Ratings Made on Ten Traits

Used Differentially to Describe Supervisors and Nonsupervisors

Trait	Supervisors	Nonsupervisors	Significance Tests
Deliberation skill	86.9	78.6	$\chi^2(1, \underline{N} = 443) = 4.73*$
Maturity/Adjustment	56.0	42.9	$\chi^2(1, \underline{N} = 443) = 6.69**$
Optimism	32.8	44.3	$\chi^2(1, \underline{N} = 441) = 5.35*$
Initiative	32.8	44.3	$\chi^2(1, \underline{N} = 441) = 4.01*$
Independence	64.2	80.4	$\chi^2(1, \underline{N} = 442) = 12.22***$
Need for Autonomy	56.6	70.2	$\chi^2(1, \underline{N} = 442) = 7.67**$
Leadership Ability	63.3	51.8	$\chi^2(1, \underline{N} = 443) = 5.22*$
Fairness/Objectivity	36.0	25.6	$\chi^2(1, \underline{N} = 443) = 4.71*$
Ability to Develop Others	56.0	35.7	$\chi^2(1, \underline{N} = 443) = 16.38***$
Organizational Awareness	43.6	28.6	$\chi^2(1, \underline{N} = 443) = 9.42**$

Note. Underlined values indicate higher percentage.

*$\underline{p} < .05$.   **$\underline{p} < .01$.   ***$\underline{p} < .001$.

Table 10

Percentage of High Confidence Ratings Made on Thirteen Traits

Used Differentially to Describe Three Levels of Manager Candidates

| Trait | Level of Management | | | Significance |
	Top	Middle	Lower	Tests
Analytic Ability	89.4	79.9	70.8	$\chi^2(2, N = 443) = 10.42$**
Deliberation Skill	89.4	88.5	75.6	$\chi^2(2, N = 443) = 13.24$***
Long Range Thinking	69.7	51.2	41.7	$\chi^2(2, N = 443) = 15.01$***
Results Orientation	71.2	76.6	56.5	$\chi^2(2, N = 443) = 17.51$***
Decisiveness	59.1	58.2	42.8	$\chi^2(2, N = 440) = 10.13$**
Emotional Expressiveness	77.3	79.3	68.1	$\chi^2(2, N = 443) = 6.46$*
Independence	59.1	70.2	75.6	$\chi^2(2, N = 442) = 6.25$*
Insight into Others	81.8	93.8	89.3	$\chi^2(2, N = 443) = 8.50$**
Openness to Negative Feedback	60.6	45.5	57.1	$\chi^2(2, N = 443) = 7.32$*
Planning/Organizing	90.9	82.2	75.4	$\chi^2(2, N = 441) = 7.74$*
Fairness/Objectivity	48.5	30.6	28.0	$\chi^2(2, N = 443) = 9.61$**
Ability to Develop Others	65.2	51.7	38.7	$\chi^2(2, N = 443) = 14.63$***
Organizational Awareness	40.9	45.5	29.2	$\chi^2(2, N = 443) = 10.60$**

*$p < .05$.   **$p < .01$.   ***$p < .001$.

fairness and objectivity, and organizational awareness. With the exception of the trait, insight into others, traits again showed a tendency to increase in relevance with management level. Finally, four traits showed a significant relationship between relevance and management level at p <.05. Independence decreased in the percentage of high confidence ratings as level of management rose. The emotional expressiveness of lower level managers was less likely to be rated with high confidence than that of top and middle managers. Middle managers were least likely to be described explicitly on the trait of openness to negative feedback. The ability to plan and organize increased in relevance with level of management.

Relevance of traits to job functions. Ten of the 55 traits were differentially rated with high confidence across seven functional subgroups of managers (Table 11). This exceeds the 2.75 variables which might be expected to be significant on the basis of chance (p=.05). Three of the traits (verbal articulation skills, independence, and self-confidence) which indicated differences across subgroups in the percentage of their high confidence ratings were significant at p <.01; the other seven were significant at p <.05.

Whereas creativity was rated with high confidence for 82.1% of the candidates for engineering and other research jobs, it was rated with high confidence in only 50% of the cases of applicants for production and manufacturing positions. The trait, verbal skills, was also rated with high confidence least frequently (50%) in the subgroup of production and manufacturing personnel, but most often (93.8%) in the cases involving candidates for general administrative positions.

Table 11

Percentage of High Confidence Ratings Made on Ten Traits

Used Differentially to Describe Candidates Categorized by Job Function

Trait (Range of $\underline{n}$) =	Job Function							Significance Tests
	M/S (176–177)	HRD (24)	F/A (77)	R&D (27–28)	P/MFG (70)	GA (16–17)	GM (29)	
Creativity	58.2	79.2	59.7	82.1	50.0	70.6	51.7	$\chi^2(6, \underline{N} = 422) = 14.17*$
Verbal Skills	73.4	79.2	69.7	75.0	50.0	93.8	65.5	$\chi^2(6, \underline{N} = 420) = 19.98**$
Emotional Stability	59.9	58.3	79.2	50.0	61.4	82.4	69.0	$\chi^2(6, \underline{N} = 422) = 14.80*$
Ambiguity Tolerance	31.3	54.2	42.9	32.1	47.1	52.9	55.2	$\chi^2(6, \underline{N} = 421) = 14.07*$
Initiative	54.5	62.5	36.4	64.3	41.4	52.9	46.4	$\chi^2(6, \underline{N} = 420) = 13.19*$
Independence	77.8	75.0	70.1	75.0	60.0	58.8	44.8	$\chi^2(6, \underline{N} = 421) = 18.89**$
Self-Confidence	75.7	66.7	76.6	46.4	62.9	58.8	82.8	$\chi^2(6, \underline{N} = 422) = 16.97**$
Leadership Ability	52.0	45.8	64.9	60.7	71.4	64.7	75.9	$\chi^2(6, \underline{N} = 422) = 14.54*$
Team Orientation	69.5	79.2	81.8	92.9	68.6	58.8	79.3	$\chi^2(6, \underline{N} = 422) = 13.33*$
Developing Others	45.8	50.0	49.4	39.3	58.6	35.3	75.9	$\chi^2(6, \underline{N} = 422) = 13.86*$

Note. M/S=Marketing/Sales. HRD=Human Resources & Personnel. F/A=Finance/Accounting.
R&D=Research & Development/Engineering. P/MFG=Production/Manufacturing.
GA=General Administration. GM=General Management.
*$\underline{p}$ < .05. **$\underline{p}$ < .01.

The subgroup showing the highest percentage of high confidence ratings on emotional stability included candidates for general administrative positions (82.4%); engineering and research candidates were rated with high confidence on this trait in only 50% of the cases. Explicit reference to a candidate's tolerance for ambiguity was most likely if applying for positions in general management (55.2%), human resources and development (54.2%), or general administration (52.9%); however, this trait was rated with high confidence in only 31.3% of the candidates for marketing and sales positions and 32.1% of those applying for engineering or research positions. Initiative was most often discussed explicitly in the reports on candidates for engineering or research jobs (64.3%) and positions in human resources (62.5%); whereas, it was specifically referred to in only 36.4% of the reports on candidates for finance or accounting positions. Whereas the independence of general management candidates was rated with high confidence in only 44.8% of all cases, explicit reference was made to this trait in 77.8% of candidates for positions in marketing and sales, 75% of candidates for jobs in human resources, and 75% of those seeking positions in engineering and research. The self-confidence of general management candidates was referred to explicitly in 82.2% of all cases; however, only 46.4% of the cases of candidates for jobs in engineering and research were rated with high confidence on this trait. Candidates for general management and production—manufacturing positions were the functional subgroups most often rated with high confidence on leadership ability (75.9% and 71.4%, respectively); however, only 45.8% of candidates for positions in human resources and 52% of those seeking

marketing or sales jobs were so rated on this trait. Team orientation
was most relevant to candidates for positions in engineering and
research (92.9%) and finance and accounting (81.8%); only 58.8% of
candidates for general administrative positions were rated with high
confidence on this trait. Whereas ability to develop others was rated
with high confidence in 48.4% of the pooled sample of candidates (Table
8), the relevance of this trait varied considerably across functional
subgroupings (Table 11), ranging from a low of 35.5% of candidates for
general administrative positions to a high of 75.9% of those seeking
positions in general management.

Summary. The two traits with the lowest proportion of high
confidence ratings (and, by implication, of least relevance to the
report writers), extra-organizational awareness and political savvy,
were also rated with relatively low intercoder reliability. Further-
more, they did not show differential relevance to any of the dimen-
sional (gender and job) subgroupings of manager candidates. Therefore,
dropping these variables became a serious consideration. Subsequent
analyses were conducted both with and without these variables to
determine whether their omission would have any consequence.

Four variables (fairness, optimism, organizational awareness,
and tolerance for ambiguity), although rated with high confidence in
fewer than 40% of the total sample of cases (Table 8), were found to
have differential relevance for subgroups of the candidate sample.
Also, these variables had acceptable levels ($r > .60$) of intercoder
reliability. Therefore, they were retained for subsequent analyses
without special treatment.

Seven additional variables were identified as being coded with high confidence in less than 50% of the cases (Table 8). The variables (and their proportion of high confidence ratings) in the pooled management sample are as follows: adaptability to change (49.6%), need for power (48.8%), initiative (48.7%), ability to develop others (48.4%), risk taking orientation (44.2%), general interpersonal skills (43.5%), and intuition (43.1%). However, each of these variables was found to have greater than 50% relevance for some of the candidate subgroups. With the exception of the variables adaptability to change and risk taking orientation, the other five variables indicated differential relevance to at least one of the subgroups. Therefore, these variables were retained for subsequent analyses.

Dimensional Reduction of Personality Predictors

Factor Analyses

The matrix of intercorrelations on which the factor analyses were based is presented in Appendix G ($\underline{N}$ = 392). The matrix is based on Pearson product moment correlations; however, a matrix based on Kendall's tau beta was very similar and yielded very comparable structures through both principal components and factor analyses. Thus, subsequent findings are based on the matrix of Pearson correlation coefficients.

The results from various methods which were used to reduce the matrix yielded very similar structures; however, depending on the criterion employed for determining the number of factors to extract, a small variation occurred in the number of factors which were retained. A principal components analysis using the minimum eigenvalue criterion

(eigenvalues greater than one) yielded nine components accounting for 61% of the total variance. A principal axis factor analysis with Varimax rotation employing the mineigen criterion also yielded a nine factor solution accounting for 53.5% of the common variance. Maximum likelihood (ML) factor analysis yielded 11 factors with preliminary eigenvalues greater than one which accounted for 56% of the common variance. An ML solution based on the proportion of variance explained by the factors after rotation extracted 12 factors which accounted for 57% of the common variance. However, a scree plot of the eigenvalues suggested breaks at 5, 9, and 18 factors.

The overall composition of the first five factors was essentially invariate across factoring approaches and suggested that a five factor model was perhaps the most parsimonious that could be identified. Despite the fact that a five factor model was able to account for 47% of the common variance, the factorial complexity of 15 low loading variables in the five factor solution, coupled with the large eigenvalue (2.89) associated with the fifth factor, suggested that more factors were appropriate. Chi-square tests associated with the ML method suggested that at least 12 factors were required. Based on the 55 variable matrix, the Tucker-Lewis coefficient of .95 indicated optimal fit with a 12 factor model.[8] When applying the large sample chi-square test to examine the significance of residual variance after subtracting the reproduced from the original correlation matrix, more

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[8]Based on a 53 variable matrix which exluded the variables extra-organizational awareness and political savvy, the Tucker-Lewis coefficient (.97) suggested that a 14 factor model best fit the data (χ^2 (727, $\underline{N}$ = 393) = 892.63).

than 14 factors were indicated ($\underline{p}$ <.001); however, in testing a 15 factor model, ultra-Heywood cases (communality estimates greater than one) were encountered during the iterative procedure. Thus, 14 factors were considered the maximum number of factors that could be retained.

Table 12 displays the salient loadings (i.e., those at least .30) of the rotated (Promax) factor pattern resulting from 12 factor model determined to be the most interpretable and replicable from all solutions examined. It was derived using maximum likelihood (ML) factor analysis and the number of factors extracted was based on the proportion (100%) of the total variance explained. The 12 factors accounted for 57% of the common variance. Eleven of the factors were identifiable (the twelfth factor had no primary loadings).

The oblique solution shown in Table 12 was very similar to an orthogonal solution obtained using ML with Varimax rotation. However, because some correlation among factors was hypothesized, the oblique solution was the preferred model. Table 12 also presents the variance accounted for by each factor after eliminating the effects of other factors (i.e., based on the sum of the squared semipartial correlation coefficients). The twelve factors uniquely accounted for a total of 59% of the variance explained by the factors; the remaining 41% was shared variance due to the correlation amongst factors. Table 13 contains the intercorrelations amongst factors. None of the intercorrelations exceeded .44, suggesting relative independence of the factors.

The 12 factor model was closely replicated across a randomly split half of the sample of cases and a sample of cases ($\underline{N}$ = 235) which

Table 12

Salient Factor Loadings for 55 Psychological Traits

Used to Rate Manager Candidates (N=392)

	Factors											
	1	2	3	4	5	6	7	8	9	10	11	12
Interpersonal skill	81											
Respect others	74											
Flexibility	73											
Listening skill	70											
Affiliativeness	67					(41)						
Social skill	61											
Fairness	54											
Team orientation	52	(-31)										
(Political savvy)	45											
Insight into others	44											
Persuasiveness	42	(36)							(30)			
Openness to feedback	37				(33)							
Independence		82										
Need for autonomy		72										
Need for power		71										
Decisiveness		68										
Risk oriented		60									(41)	
Self-confidence		57			(40)							
Initiative		55										
Results oriented		52										
Assertiveness		51										
Need to advance		39										
Abstract thinking			89									
General ability			74									(65)
Analytic reasoning			72									
Curiosity			66									
Ambiguity tolerance			65								(32)	
Deliberation skill			57	(47)								
Creativity			57									
Long range thinker			48									
Data gathering skill			45	(42)								
Mental agility		(38)	43									
Perseverance				72								
Administrative skill				71								
Practical judgment				56								
Detail oriented				54				(-30)				
Commits to excel				50								
Intellectual focus				48								
Planning skills				43								
Integrity				39								
Stability					68							
Mature & adjusted					66							
Stress tolerance					53							
Energy		(31)				57						
Expressiveness						53						
Optimism						33						
Organizationally aware							89					
(Extra-organizational)			(46)				52					
Self-development								52				
Insight into self	(40)							45				
Verbal (articulate)									58			
Leadership	(30)	(32)								61		
Develops others	(50)									55		
Adapts to change			(31)								47	
Intuition				(-35)							39	
% Variance Explained:[a]	10.2	10.4	9.7	6.5	3.8	3.8	2.7	2.8	2.3	2.4	2.5	1.9

Note. Decimals have been dropped. Variables in parentheses were subsequently dropped.
[a] Variance reported is the percentage of common variance explained by each factor controlling for the effects of other factors (i.e., the sum of the squared semipartial correlation coefficients).

Table 13

Correlation amongst Factors

Factor Labels	Factors											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Human Relations Skills	—											
2. Autonomous Action Orientation	.00	—										
3. Conceptual Skills	.32	.39	—									
4. Work Motivation	.20	-.06	.21	—								
5. Emotional Adjustment	.42	-.01	.19	.43	—							
6. Vitality	.12	.11	-.14	-.23	-.02	—						
7. Broad Scope Thinking	.19	.12	.35	.30	.21	.06	—					
8. Self-insight	.19	.13	.23	.28	.11	.01	.32	—				
9. Verbal skill	.13	.34	.17	-.05	-.01	.25	.13	.01	—			
10. Leadership	.23	.02	.24	.41	.27	.05	.44	.28	.08	—		
11. Adaptability	.24	.12	.07	-.16	.09	.28	.17	.20	-.02	.17	—	
12. (Mental Ability)	-.25	-.37	-.30	.11	.08	-.02	-.03	-.02	-.34	.03	.16	—

Note. Mental ability is enclosed in parentheses to indicate that this variable loaded only secondarily on Factor 12 (which had no other loadings).

excluded low confidence ratings. Although the factor solution presented in Table 12 was based on the 55 variable matrix of intercorrelations, the 12 factor model was essentially similar to a solution derived from a 53 variable matrix.[9]

The first factor, labeled Human Relations Skills, represents a set of characteristics reflecting both the capacity and the inclination to relate to others. An individual rated high on this factor would be characterized as one who respects others, is flexible in dealing with them, can listen well, and enjoys the company of others (i.e., is affiliative). In a more work related manner, this factor also characterizes one who is team oriented and fair and objective in dealing with others. Additionally, facility in social exchanges and the ability to influence and/or persuade others are also of relevance to this dimension. The internal consistency (Cronbach's alpha) of a scale using unit weighting of the 12 items on this factor was .89 (the item-total correlations for scales derived from variables loading on this and other factors are provided in Table H1 of the Appendix).

The second factor, which I have called Autonomous Action Orientation, is a bit more complex in its composition. It is characterized by independence, decisiveness, self-confidence, initiative, and needs for autonomy and power or dominance. Assertiveness, the need to advance in one's career, and the tendency to take risks and to seek results are additional traits representative of this factor. The alpha

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[9]The factor analysis of the 53 variable matrix, omitting the variables political savvy and extra-organizational awareness, yielded an 11 factor solution. Organizational awareness shifted to Factor 3 with a loading of .37 in this solution.

reliability of a scale based on unit weighting of the 10 items on this factor was .87.

The third factor, labeled Conceptual Skills, involves abilities to think abstractly and to solve problems through adequate gathering of data, analytic reasoning, and deliberation. General mental ability, intellectual curiosity, tolerance for ambiguity or uncertainty, the ability to think long range, as well as the ability to be creative and mentally agile also characterize this factor. The alpha coefficient for the nine items loading on this factor was .87.

The fourth factor, labeled Work Motivation, is characterized by task oriented behaviors and a value based conscientiousness that is representative of the "work ethic." High scorers on variables which load on this factor persevere in the face of obstacles, are detail oriented and follow through on administrative tasks, are committed to high standards, and display the ability to direct their intellectual focus to the matter at hand. They also show practical judgment and have integrity. Also, they are able to plan and establish priorities in their work. An alpha reliability coefficient of .78 was obtained for a unit weighted scale formed from the eight variables which loaded on this factor.

The fifth factor, labeled Emotional Adjustment, is characterized by emotional stability and maturity, as well as the ability to tolerate stress, pressure, and frustration. Despite the fact that only three variables loaded on this factor, its alpha reliability was .80.

The sixth factor, labeled Vitality, includes the characteristics of energy and drive, emotional expressiveness, and optimism. The alpha

reliability of the scale formed from the three items which loaded on this factor was only .52, a probable consequence of the lower intercoder reliability obtained on emotional expressiveness ($\underline{r}$ =.58).

The seventh factor, called Broad Scope Thinking, includes the traits of organizational and extra-organizational awareness. Thus, it characterized an orientation toward looking beyond the concerns of one's specific management unit and considering issues and influences having broader organizational impact. As noted earlier, a factor solution excluding the trait extra-organizational awareness, resulted in organizational awareness loading on the Conceptual Skills factor. However, in view of its low loading on that factor (.37) and its differential relevance to psychologists when describing candidates differing in supervisory requirements or level in the management hierarchy (see earlier findings on trait relevance), it was retained for additional analysis. This was further supported by the satisfactory alpha reliability of .80 obtained for a unit weighted scale composed of these two variables.

The eighth factor, labeled Self-insight, was characterized by the tendency to be realistically introspective about one's strengths and limitations and to commit to a course of self improvement and growth that addresses one's developmental needs. The items on this factor represent the self component of the firm's a priori dimension called insight into self and others. With only two loadings, the alpha reliability coefficient for the unit weighted scale based on this factor was .72.

The ninth factor, labeled Verbal Skill, consisted of only one variable by the same name. The trait definition emphasized the ability of a candidate to be articulate. It appears that this characteristic is unrelated to other dimensions of personality assessed in this study. The only other variable to load (secondarily) on this factor was persuasiveness, and its loading was only .30. Insofar as the inter-coder reliability on this trait was relatively low (r = .64) and it was impossible to obtain a measure of internal consistency on the factor, its retention as one of the predictor dimensions in the next stage of analysis was held in question pending a determination of its relationship to the recommendation criterion.

The tenth factor, labeled Leadership, is characterized by the ability to both lead and develop others. These two variables together indicate an ability to be a mentor, to discern and to draw out the potential of subordinates, as well as the ability to direct others in getting work done. This factor is moderately correlated with Factor 4, Work Motivation (r =.41), and Factor 7, Broad Scope Thinking (r =.44), and it did not appear as a separate factor until 10 factors had been extracted. Therefore, its retention as a non-trivial factor might be questioned. However, the appropriateness of retaining this factor was supported by several considerations. In more parsimonious models, the leadership variable had a factorial complexity of 3 or 4 (with low loadings on Factors 1, 2, 3, and 4), a probable consequence of its conceptual complexity. In addition, in an earlier section (on trait relevance) evidence was presented which indicated that both leadership and the ability to develop others were used differentially by psych-

ologists to describe subgroups of manager candidates (e.g., supervisors versus nonsupervisors). Findings to be presented later (in the sections on the regression analyses) also supported the importance of this factor for psychologists' differential recommendations. A final consideration supporting retention of this factor was that, despite being comprised of only two variables, the alpha coefficient of its unit weighted scale was a satisfactory .80.

The eleventh factor, Adaptability, includes the ability to adapt to changing circumstances as well as to intuitively size up situations and respond on the basis of one's hunches. The factor, although relatively uncorrelated with other factors, represents a dimension of personality that differs considerably from Work Motivation (Factor 4). Whereas Work Motivation includes the concepts of deliberative planning and perseverance, Adaptability represents an ability to shift gears quickly as circumstances may warrant -- often on the basis of minimal cues. This description was theoretically reinforced by the fact that tolerance for ambiguity or uncertainty and risk taking orientation also loaded (although only secondarily) on this factor.

Adaptability (with intuition) did not emerge as a separate factor until 12 factors were extracted, yet several considerations supported its retention as a separate dimension of personality in this study. In models with fewer factors, both adaptability to change and intuition were factorially complex and varied in the factors they loaded on with different factor solutions. Also, during the early process of deciding the personality characteristics to rate from psychologists' reports, officers of the consulting firm had separately

stressed the importance of adaptability to change (V. J. Heckler, personal communication, summer 1984) and intuition (R. O. Shaffer, personal communication, summer 1984) as predictors of management effectiveness. The decision to retain this factor on the basis of its substantive significance was further supported by the results of the regression analyses (to be presented in the following sections of this chapter). Therefore, despite a relatively low alpha coefficient (.55), the decision was made to retain this as a non-trivial factor.

The twelfth factor, labeled Mental Ability, included only one secondary loading of a variable representing general intellectual ability. Because this factor had a higher loading on the Conceptual Skills Factor, a question was raised whether to drop the twelfth factor as trivial. Before doing so, however, the choice was made to determine its separate contribution in accounting for variance in psychologists' recommendations for either the total or homogeneous subgroups of the candidate sample. These findings will be presented in a later section of this chapter.

Preliminary Regression Analyses

Although the twelve factor model appeared to be the most appropriate for capturing the variance in the trait ratings, additional support for its adequacy was that it be able to account for variance in psychologists' recommendations at least as well or better than models based on either the firm's a priori dimensional framework or the most parsimonious five factor model. In addition, several other considerations led to a determination of the final set of predictor scales. A major concern was that the variables comprising a scale bear a consis-

tently similar directional relationship to the criterion measure. To examine the relationship of each of the individual traits to psychologists' recommendations regarding either the pooled management sample or subgroups of the total sample, a series of multiple regression analyses were conducted. However, before reporting on any comparisons among these regression analyses, another issue needed resolution—namely, the determination of the number of levels to use in defining the criterion variable. These findings will be presented first.

Recommendation criterion. To empirically determine the best representation to use for the criterion measure, two through five levels of the recommendation were defined (through recoding). Each was then regressed on the entire set of single predictors, on the empirically based five and twelve factor models of the predictors, and on the firm's own five a priori dimensional framework. Table 14 presents the results of the regression of either a dichotomous or a five-level recommendation criterion on different sets of predictors. The five level criterion resulted in the highest multiple correlation squared in all regression analyses.[10] Owing to its superiority in variance-accounted-for across different sets of predictors, all subsequent analyses were conducted using this recoded measure of the criterion.[11]

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[10]Only the two- and five-level representations of the recommendation criterion are presented in Table 14. When regressed on the entire set of predictor variables (55), the R^2 for the three-level criterion was .51 and the four-level, .54.

[11]The recoding of the five level criterion was presented in Chapter III (Method) and is shown in Appendix F.

Table 14

R^2 of Dichotomous and Five-level Recommendation

Criterion Obtained with Different Sets of Predictors

Model	Recommendation Criterion	
	Dichotomous (R^2)	Five-level (R^2)
Set of 55 single predictors[a]	.53****	.56****
Ten factor-based scales from 12 factor solution[b]	.41****	.48****
Five factor-based scales[b]	.40****	.46****
Five a priori dimensions[b]	.40****	.45****

Note. Two factors with single loading variables (Verbal skills and Mental Ability) were not included in the analysis using the 12 factor solution.
[a]N = 392. [b]N = 420.
****p < .0001.

Comparison of models. The reliabilities (coefficient alpha) and standardized regression coefficients (betas) for predictor scales derived from different dimensional models are shown in Table 15.[12] Although overall differences among models in terms of R^2 were trivial (Table 14), some differences in the reliabilities and relative importance of scales within each model may be noted. As the models increased in complexity (i.e., number), each scale had fewer items and, in most cases, a consequent reduction in its alpha coefficient. Also, as the models increased in complexity, some shift occurred in the significance of the predictor scales. Most notably, Autonomous Action and Conceptual Skills failed to achieve significance in their relationship to the criterion in the more complex model; however, Emotional Adjustment (with the same three items) did indicate a significant relationship. To better understand the failure of some of the scales to achieve significance, attention was next directed to the relationship of the individual trait items to the criterion variable.

Regression of criterion on individual trait variables. As shown in Table 16, a multiple regression analysis ($\underline{N}$ = 364) revealed that the 55 individual predictor variables accounted for 56% (48% adjusted) of the variance in the (five-level) recommendation criterion. As noted earlier, the regression of the criterion on 53 variables (omitting political savvy and extra-organizational awareness) produced virtually

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[12]The components and corrected item-total correlations for the scales comprising the firm's a priori model are presented in Table H-1 of the Appendix. The components and corrected item-total correlations for the scales comprising the five, nine, and twelve factor-based models are provided in Table H-2. The factor-based models actually consisted of 5, 8, and 10 non-trivial scales (single item scales such as Verbal Skills and Mental Ability were not included at this stage).

Table 15

Reliabilities (Coefficient Alpha) and Standardized

Regression Coefficients (Betas) for Predictor Scales

Derived from Different Dimensional Models

Model Scale Labels	Coefficient alpha[a]	Beta[b]
Ten scales from 12 factor model		
Human Relations skills	.89(12)	.28****
Autonomous action	.87(10)	-.04
Conceptual skills	.87(10)	.08
Work motivation	.78(8)	.21****
Emotional adjustment	.80(3)	.09*
Vitality	.52(3)	.09*
Broad scope	.80(2)	.05
Self-insight	.72(2)	-.01
Leadership	.80(2)	.11*
Adaptability	.55(2)	.11*
Five factor-based model		
Human Relations skills	.90(16)	.41****
Autonomous action	.88(13)	.09*
Conceptual skills	.89(12)	.12**
Work motivation	.80(11)	.19****
Emotional adjustment	.80(3)	.09
Five a priori dimensions		
Intellectual effectiveness	.84(14)	.11*
Emotional adjustment	.84(20)	.09
Human Relations skills	.81(5)	.17***
Insight into self & others	.79(7)	.16**
Organization & Supervision	.82(9)	.29****

Note. [a]Numbers in parentheses indicate the number of items on a scale.
[b]Betas refer to standardized regression coefficients. Significance of
betas based on t-test. N = 420.
*p < .05. **p < .01. ***p < .001. ****p < .0001.

Table 16

Regression Analyses

Compared for Pooled Samples of Manager Candidates

Analysis	R^2	Adjusted R^2	Significance Tests
Analysis A	.56	.48	$F(55,309) = 7.13$****
Analysis B	.55	.48	$F(53,314) = 7.32$****
Analysis C	.63	.52	$F(53,172) = 5.56$****

Note.   Analysis A included all 55 variables and all ratings (i.e., ratings made under all levels of coder confidence after listwise deletion of missing data). Analysis B included 53 variables (omitting political savvy and extra-organizational awareness) and all ratings. Analysis C included 53 variables and ratings made with moderate or high coder confidence (i.e., low confidence ratings omitted).
****$p < .0001$

identical results. As expected, the individual predictors accounted for a greater proportion of variance in the criterion $\underline{R}^2$ = .63 (adjusted $\underline{R}^2$ = .52) for a subsample of cases in which low confidence ratings were omitted ($\underline{n}$ = 225); however, the difference was not great enough to warrant the loss of statistical power which would result from omitting the low confidence ratings.

In general, the individual predictor model accounted for a greater proportion of variance in the criterion than did any of the reduced dimensional models. In an effort to determine a way to increase the variance accounted for by a dimensionally reduced set of scales, as well as to determine why some scales failed to show a significant relationship to the recommendation criterion, the standardized regressions coefficients (betas) were next examined.

Table 17 contains the betas of the single predictor variables (grouped by factors) which were significant in accounting for variance in the five level recommendation criterion. The resulting regression coefficients for each of the three analyses described above (see Table 15) are provided. It may be noted that some variables (e.g., social skills, risk orientation, need for power, and long range thinking ability), although loading on the same factor as other traits positively related to the criterion, indicated negative relationships to the recommendation. It was reasoned that if this pattern were to remain the same across subgroups of the sample, then reverse scoring of the negative items would be the indicated course of action. However, if variables were to shift in the direction of their relationship to the criterion, then splitting of factors to develop new scales would be

Table 17

Standardized Regression Coefficients of Single Traits

Showing a Significant Relationship to the Recommendation Criterion

(Pooled Sample)

Factor	Traits with Significant Betas:	Analysis	
		A	B
1	Interpersonal flexibility	.11*	.13**
	Listening skill	.10*	
	Persuasiveness	.16**	.14**
	Social skill	-.10	
2	Independence	.10*	.11*
	Decisiveness	.10*	
	Risk taking orientation	-.11*	
	Need for power	-.10*	
3	Long range thinking	-.10*	-.10*
4	Intellectual focus		.08*
	Integrity	.16****	.16***
7	Organizational awareness	.13**	.08*
8	Commits to Self-development	.10*	.10*
11	Adaptability to change	.19***	.17***

Note.   Analysis A included all 55 variables, N = 364.   Analysis B included 53 variables (omitting political savvy and extra-organizational awareness), N = 377.
* p <.10.   **p <.05.   ***p <.01.   ****p <.001.

indicated. Therefore, the next step consisted of examining the standardized regression coefficients obtained from regressing the criterion on the single predictor traits for diverse subsamples of manager candidates.

Regression analyses for selected subgroups. The single predictor variables were used to predict the criterion in five of the larger manager subgroups. Both the R^2 and adjusted R^2 obtained in these analyses are shown in Table 18. Although R^2 was inflated by the ratio of variables to cases, the adjusted R^2 values indicate that the individual predictors varied in different subgroups in the extent to which criterion variance could be accounted for. Recommendations were most predictable for the marketing and sales subgroup, and least predictable for lower level and nonsupervisory manager candidates.

Of greater interest for the purpose of revising the dimensionally reduced set of predictor measures were the signs and level of significance of the beta weights of the individual trait variables within each of the subgroup regression equations (see Table 19). Two things, in particular, may be noted from an examination of the significant betas shown in Table 19. First, some of the variables which indicated a negative relationship to the criterion in the pooled sample, continued to show such a relationship in the subgroups. Comparing the betas in Tables 17 and 19, it may be noted that risk-taking orientation, need for power, and long range thinking continued to be negative in sign. Some other variables which were significantly negative in their relationship to the criterion in some of the subgroups, but did not achieve significance in the pooled sample (although

Table 18

Regression Analyses for Selected Subgroups

Subgroup Analysis	R^2	Adjusted R^2	Significance Tests
Marketing & sales (M/S)	.75	.60	$F(53,91) = 5.04$****
Supervisors (S)	.62	.51	$F(53,174) = 5.46$****
Nonsupervisors (NS)	.68	.49	$F(53,81) = 3.38$****
Lower level management (L)	.69	.47	$F(53,75) = 3.13$****
Middle management (M)	.68	.54	$F(53,122) = 4.91$****

****$p < .0001$.

Table 19

Standardized Regression Coefficients of Single Traits
Showing a Significant Relationship to the Recommendation Criterion
(Subgroups)

Factor	Traits with Significant Betas:	Subgroup Analysis				
		M/S	S	NS	L	M
1	Interpersonal sk.				.33**	
	Flexibility	.23***		.29***		.21**
	Listening sk.		.14*		.20*	
	Persuasive	.30***		.25**		
	Openness to feedback					-.16*
	Fairness/objectivity				-.21*	
	Social skill	<u>-.20**</u>			-.41****	.18**
2	Self-confidence				<u>.21*</u>	
	Initiative			<u>-.21*</u>		<u>.18**</u>
	Needs autonomy	.19***				
	Risk taking			-.22*	-.22*	
3	Long range		-.13*			
	Mental agility					-.16**
	Deliberation	.21**				
	Data gathering sk.	-.16*		-.22*		
4	Administrative sk.				.26**	
	Intel. focus		.14**			.16*
	Detail oriented			-.21**		
	Integrity		.18***		.24**	.19***
	Practical judgment	.20**				.18**
6	Energy			.22**		
	Optimism	.14*				
	Expressiveness			.24**		
7	Organiz. aware		.17***			
8	Self-develops	.16*				
	Insight into self	-.16*				
10	Leadership		.20**			.32***
11	Adaptability	.23***			.35***	
	Intuition	-.24***				

Note. M/S = Marketing/Sales; S = Supervisors; NS = Nonsupervisors;
L = Lower level managers; M = Middle managers. Because the betas are
derived from independent samples, comparisons may only be made within
and not across subgroup analyses. Underlined entries show betas for
the same variable showing opposite signs in its relationship to the
criterion in different subgroups.
* p <.10.   **p <.05.   ***p <.01.   ****p <.001.

they were still negative), include: openness to feedback and mental agility (middle managers); fairness and objectivity (lower level managers); data gathering skills (marketing/sales and nonsupervisors); detail orientation (nonsupervisors); and insight into self and intuition (marketing/sales).

The second thing to note from an examination of Table 19 is that some variables (e.g., social skills, initiative) were negatively associated with the criterion for some subgroups, and positively related for others. The most striking example of this was the variable, social skill/facility, which was positively related to favorable recommendations in the middle management group but negatively associated with the recommendation made for the candidates for jobs in the pooled sample, in marketing/sales, and at lower levels of management.

Several of the factor-based predictor scales shown in Table 15 which failed to achieve significance in their relationship to the criterion, contained items which, considered singly, indicated both significant and opposite directional relationships to the recommendation. The Autonomous Action and Conceptual Skills factors are the most noteworthy examples of this. In the next series of analyses, these factors (as well as others) were split on the basis of the signs of their single items when accounting for criterion variance, and the revised set of scales were again used as predictor variables.

The scale revision process. The process of adjusting the composition of scales and regressing the recommendation on revised sets of scales was done iteratively for both the pooled and subgroup samples. Two major objectives guided the process of determining

whether to retain a cluster of items as a separate predictor. First, the new set of predictors were required to be better than the last set tried in accounting for criterion variance (i.e., R^2). Second, separate predictors (either multiple or single item scales) were required to bear a significant relationship to the criterion in at least some of the subgroup analyses.

During this process, the ability of some single item scales to predict the criterion was the subject of considerable scrutiny. However, this scrutiny only extended to the signs of an item's relationship to the criterion. The individual betas across subgroups were not statistically comparable due to the independence and varying sizes of the subgroup samples. Also, a full exposition regarding each stage of revision would prove too detailed and tedious. Therefore, some highlights of the revision and decision making process follow.

Most of the items loading on the first factor, Human Relations Skills, were positively related to the criterion in the majority of subgroups. However, as noted earlier, social skills, fairness and objectivity, and openness to negative feedback were differently associated to the criterion. Thus, this cluster was initially split off from the first factor. After trying various combinations of these four items, it was determined that social skills behaved differently from the other variables in regression analyses with subgroups of manager candidates. As a result, the other items were returned to the Human Relations Skills factor and social skills was retained as a separate predictor.

The second factor, Autonomous Action, appeared to be divided into two clusters of variables having different relationships to the criterion. The first cluster of items, named for the single variables bearing a significant positive relationship to the psychologists' recommendations, was called Decisive Independence (DI). Other items within this cluster included self-confidence and results orientation. At a later stage of revision, persuasiveness was also added to this predictor scale because of its similarity to other items on this scale in predicting the criterion.[13] The second cluster of variables within the Autonomous Action factor bearing a different relationship (usually negative) to the criterion than the first cluster was called Risk/Power Orientation (R/P) (for the items most significantly related to the criterion). Other items found to behave similarly with respect to the recommendation of candidates in diverse subgroups included: need for advancement (ambition), need for autonomy, assertiveness, and initiative. Thus, two clusters of variables (i.e., two predictor scales) were formed from the second factor. Whereas the total set of items comprising the Autonomous Action factor failed to be significantly related to the criterion, the two scales formed from this factor (Decisive Independence and Risk/Power Orientation) were each significantly related to the criterion. Furthermore, in some subgroups the two scales were both positively related to the criterion. In others, their signs were opposite with DI positive and R/P negative. In still other instances, the reverse relationship held.

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[13]The variable, persuasiveness, was factorially complex. It loaded .42 on the first factor and .36 on the second factor in the 12 factor solution.

The third factor, Conceptual Skills, initially appeared to be comprised of three clusters of variables differentially related to the criterion. As previously shown in Table 15, this factor in its original form was not significant in its relationship to the criterion for the pooled sample of manager candidates. However, some of the single items comprising the scale were significantly associated with psychologists' recommendations. For some subgroups, low scores on long range thinking, mental agility, tolerance for ambiguity (not significant), or data gathering skills were related to the criterion. Thus, a scale was formed from these items and called Tolerance for Uncertainty (TU). Three of these items (exluding data gathering skills) were subsequently found to relate similarly and significantly with respect to the criterion and were retained as a separate scale.

The variable, data gathering skills, was returned to the Conceptual Skills factor, and the remaining reduced set (minus TU) of items was renamed Conceptual Problem Solving (CPS) to better reflect its components. The remaining items on this scale were: abstract thinking ability, analytic reasoning, deliberation skills, curiosity, creativity, data gathering skills, and general mental ability.

General mental ability, although primarily loading on the Conceptual Skills factor, was the only variable to load saliently (higher than .30) on the twelfth factor. Reasoning that the twelfth factor might more reflect native or general intelligence (viz., Spearman's G factor) than the Conceptual Skills factor, general mental ability (G) (both alone and in combination with the score attained by candidates on the PPT intelligence test) was examined for its ability

to account for variance in the recommendation criterion. Despite some tendency for this variable to be associated with recommendations in the engineering and research and development subgroup, it did not operate differently from the Conceptual Problem Solving (CPS) scale and was subsequently returned to that predictor scale.

Factors 4, 5, and 6 (Work Motivation [WM], Emotional Adjustment [EA], and Vitality [V], after some attempts at revision without predictive improvement, were left with their original factor components. However, the seventh factor (Broad Scope Thinking), which was originally composed of two items (organizational and extra-organizational awareness) in the 55 variable solution, was eventually split. While organizational awareness alone was significantly related to the criterion in some subgroups (e.g., supervisors), this effect was suppressed when used in combination with extra-organizational awareness. In view of the fact that the latter variable was suspect in terms of its relevance to psychologists in this firm (see earlier section on trait relevance), it was dropped and organizational awareness was used as a separate predictor item. This decision was supported by the finding that it was differently related to the criterion than was Conceptual Problem Solving in diverse subgroups. The new predictor was named Organizational Scope (OS) and retained for the final hierarchical regression analyses.

As was shown in Table 19, when all variables were singly used as predictors in the marketing/sales subgroup, the components of the eighth factor (Self-insight and commitment to self-development) indicated directionally opposite relationships to the criterion.

Therefore, the ability of each variable to separately serve as a significant predictor was examined. Commitment to self-development was significantly related to the criterion in only the marketing/sales subgroup and it operated similarly to other items within the Human Relations Skills factor with which it was highly correlated (item-total correlation was .53). Therefore, this variable was transferred to the HR scale. The other variable on this factor, insight into self, had loaded secondarily on the HR factor and did not add appreciably to variance accounted for in the criterion when used as a single predictor. Therefore, it too was moved to the HR scale.

Verbal articulation skill was the only item loading on the seventh factor. Before dismissing it as a trivial factor, its ability to predict the criterion was empirically examined for each of the subgroups. Despite its relatively low correlation (.30) with social skills, it was found to function similarly with respect to the criterion in diverse subgroups. Therefore, the two items were subsequently collapsed into a single two item predictor scale labeled Social Facility (SF) for the final moderated regression analyses.

The tenth factor, Leadership, was originally composed of two variables -- leadership and the ability to develop others. Although these two items were highly correlated (r = .67), the presence of the ability to develop others on the same predictor scale appeared to suppress the ability of the leadership variable to account for variance differentially in diverse subgroups. Because the ability to develop others also loaded (.50) on the Human Relations factor, it was subsequently moved to the HR scale.

The original composition of the eleventh factor, Adaptability (A), proved to be a significant predictor scale in the subgroup regression analyses. Therefore, its two item scale was retained as a separate predictor in the final hierarchical regression analyses.

Summary. The twelve personality predictors (both multiple and single item scales) which were derived from the iterative process described above are shown in Table 20. The alpha coefficients obtained for multiple item scales were as follows: .90 for Human Relations Skills; .73 for Decisive Independence; .80 for Risk/Power Orientation; .84 for Conceptual Problem Solving; .64 for Tolerance for Uncertainty; .78 for Work Motivation; .80 for Emotional Adjustment; .52 for Vitality; .46 for Social Facility; and, .55 for Adaptability.[14] The interrater reliabilities (Pearson $\underline{r}$) for the two single item predictor variables were: .81 for Organizational Scope; and, .75 for Leadership Ability. With the exception of the three dual item scales (V, SF, and A), reliabilities were within a desirable range. Despite the attenuation likely to result from the lower reliabilities of the three dual item scales, the potential gain in information about psychologists' differential recommendations led to the decision to retain these predictor dimensions.

Regression of the Criterion on the Final Set of Personality Predictors

Prior to undertaking the hierarchical regression analyses to be presented in the next section, the recommendation criterion was regressed on the final set of personality predictors. This final set

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[14]The item-total correlations for each of the scales is shown in Appendix I.

Table 20

Composition of the Final Set of Predictor Dimensions

HUMAN RELATIONS SKILLS (HR): Interpersonal flexibility; overall interpersonal skills; listening skills; fairness and objectivity toward others; respect for others; openness to feedback; affiliativeness; team orientation; insight into others; ability to develop others; insight into self; and, commitment to self-development. (12 items)

DECISIVE INDEPENDENCE (DI): Independence from others; decisiveness; self-confidence; results orientation; and, the ability to persuade and influence others. (5 items)

RISK/POWER ORIENTATION (R/P): Risk taking orientation; need for power and/or control; need for autonomy; assertiveness; initiative; and, ambition and need for advancement. (6 items)

CONCEPTUAL PROBLEM SOLVING (CPS): Abstract/conceptual thinking ability; general mental ability; analytic reasoning/incisive thinking; deliberation skills; data gathering skills; curiosity/inquisitiveness; and, creativity/innovativeness. (7 items)

TOLERANCE FOR UNCERTAINTY (TU): Tolerance for ambiguity and complexity; long range thinking ability/farsightedness; and, mental agility. (3 items)

WORK MOTIVATION (WM): Perseverance; administrative skill/implementation and follow through; practical judgment; detail orientation; commitment to excellence/high work standards; intellectual focus and mental discipline; planning/organizing/prioritizing skills; and, personal integrity. (8 items)

EMOTIONAL ADJUSTMENT (EA): Emotional stability; overall adjustment and maturity; and, tolerance for stress, pressure, and frustration. (3 items)

VITALITY (V): Energy and drive; emotional expressiveness; and, optimism. (3 items)

ORGANIZATIONAL SCOPE (OS): Broad organizational awareness. (1 item)

SOCIAL FACILITY (SF): Social ease; facility in verbal presentation, articulation, and expression. (2 items)

LEADERSHIP (L): Ability to lead others in terms of both the initiation of structure and the maintenance of harmonious relations. (1 item)

ADAPTABILITY (A): Adaptability to change/behavioral flexibility; intuitive sense and ability to operate on hunches. (2 items).

of predictors accounted for a significant 51% of the variance in psychologists' recommendations, $F(12,405) = 35.48$, $p < .0001$. In terms of adjusted R^2 (.50), this represented a statistically significant 4% improvement over the variance accounted for by the original set of factor-based scales (adjusted R^2 was .46). The multiple R obtained when regressing the recommendation on the set of 12 revised predictor scores was significantly higher than the multiple R obtained when predicting the criterion from the original set of factor-based scales ($z = 2.27$, $p < .05$).[15]   Furthermore, the multiple R obtained when regressing the psychologists' recommendations on the set of 12 revised scales did not differ significantly from the multiple R of the 55 single variable predictor set ($z = -1.26$, n.s.). Thus, the revised scales improved the predictability of the criterion over the factor-based scales, while simultaneously allowing an increase in statistical power available for subsequent analyses over what would have been available using the 55 (or 53) single variable predictor set.

The ability of the reduced set of personality dimensions to account for variance in the criterion was cross-validated in a sample of cases ($n = 325$) for which all low confidence ratings were omitted. Under these circumstances, the personality predictors accounted for 52% of the variance in the criterion and the same pattern of partial coefficients was obtained. Cross-validation of the model was also done on a randomly split half of the total sample of cases ($n = 207$). The

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[15]To statistically test whether one set of predictors correlates better with a criterion than another set of predictors when both correlations are based on the same sample, the normal curve deviate (z) representing the difference in transformed multiple Rs was computed using formulas provided by Tabachnik and Fidell (1982, pp. 114-115).

R^2 was again .52. Also, the relative importance of the predictors in relation to the criterion was identical to the full sample analysis, although two fewer predictors achieved significance owing to the loss in statistical power.

Hierarchical Regression Analyses

Change in R^2 for Sets of Research Dimensions

Tables 21 through 23 show the change in R^2 resulting from the hierarchical entry of different sets of research dimensions. The three tables are identical in terms of the demographic covariate set (age and sex) entered at Step 1, and the set of 12 personality predictors entered at Step 2. The tables differ in terms of the job dimension setthat was entered at Steps 3 (i.e., job type) and Steps 4 (i.e., the interaction of personality predictors and job types).

As shown in Tables 21 to 23, the demographic variable set in each instance accounted for a trivial and nonsignificant amount of variance in psychologists' recommendations. However, with the entry of the set of personality predictors, a sizable and highly significant increase in criterion variance was accounted for, (R^2 change = .51, $p <$ .0001).

When the supervisory-nonsupervisory dichotomy of candidate job type was entered at Step 3, no additional proportion of variance in psychologists' recommendations was accounted for. As expected, recommendations were not made as a function of whether the candidate sought a job with or without supervisory responsibility. However, a significant increase in variance in the criterion was accounted for by the interaction of supervisory requirements and personality predictor

Table 21

Change in R^2 When Personality Predictors are Moderated

by Information on Supervisory Requirements of Jobs

Step	Predictor Set	R^2	Cumulative $\underline{F}$	R^2 Change	$\underline{F}$ Change
1	D=Demographics (Age & Sex)	.01 n.s.	1.66(2,411)	—	—
2	P=Personality Dimensions	.52****	30.29(14,399)	.51****	34.79
3	S=Supervisory Responsibility	.52****	28.21(15,398)	.00 n.s.	.10
4	P X S Interaction	.55****	18.73(25,388)	.03**	2.69

$\underline{p}$<.01.   **$\underline{p}$<.0001.

Table 22

Change in R^2 When Personality Predictors are Moderated

by Information on Job Level

Step	Predictor Set	R^2	Cumulative F	R^2 Change	F Change
1	D=Demographics (Age & Sex)	.01 n.s.	1.77(2,409)	--	--
2	P=Personality Dimensions	.52****	30.79(14,397)	.51****	35.33
3	L=Job Level	.53****	27.39(16,395)	.01 n.s.	.11
4	P X L Interaction	.55****	12.79(36,375)	.03 n.s.	.41

****p<.0001.

Table 23

Change in R^2 When Personality Predictors are Moderated

by Information on Job Function

Step	Predictor Set	R^2	Cumulative F	R^2 Change	F Change
1	D=Demographics (Age & Sex)	.01 n.s.	1.17(2,392)	--	--
2	P=Personality Dimensions	.51****	28.73(14,380)	.51****	33.13
3	F=Job Function	.53****	20.73(20,374)	.01 n.s.	1.52
4	P X F Interaction	.62****	8.13(66,328)	.10**	1.78

**$p<.01$.   ****$p<.0001$.

variables (R^2 change = .03, p < .01). Thus, a candidate's standing on some personality measures was differentially related to being recommended as a function of whether or not the job included supervisory responsibility. The single interaction effects found to be significant within this model will be presented and discussed in the next section focusing on differential prediction models.

Table 22 presents the incremental change in R^2 resulting from the addition of information on candidates' level within the organizational hierarchy. Once again, the main effect for job level was nonsignificant, as expected. Contrary to expectations, however, the weights given personality predictors in psychologists' recommendations were not significantly moderated by considerations of candidates' level of management. Although an additional 3% of the criterion variance could be explained by the entry of the set of cross product terms (i.e., personality dimensions x job level), the change in R^2 was not statistically significant. As a consequence, following Fisher's protected F-test procedure, only the hypothesized interaction effects were separately examined.

As shown in Table 23, the functional requirements of jobs had a moderating effect on psychologists' weighting of personality predictors. Despite the loss in statistical power resulting from the entry at Step 4 of the cross product terms for personality by job function, the change in R^2 was significant (p < .01). An additional 10% of the variance in the criterion was accounted for by consideration of the interactions between candidates' scores on the personality dimensions and the functional requirements of jobs. The single main

and interaction effects will be presented and discussed in the next section.

Models of Psychologists' Recommendation Policies

In this section, both hypothesized and empirical models of psychologists' recommendation decisions are presented. In conjunction with each of the empirically derived models, the main and interaction effects that were earlier hypothesized (i.e., after the factor analyses and before any regression analyses) to show a significant relationship to psychologists' recommendations will be presented. After the factor model of the personality ratings was determined (but before scale revisions occurred), expectations regarding the relationship of the predictors to the criterion were specified for four different regression models.

The first model to be presented was based on the multiple regression analyses employing the 12 personality dimensions as the sole set of independent variables. The second model takes into account the contingent relationship between personality predictors and supervisory job responsibilities in determining psychologists' recommendations. Due to the nonsignificant findings (viz., the overall F test) regarding the interaction of levels of management and personality dimensions, only the a priori hypotheses which were formulated regarding the moderating effects of job level will be provided. No empirical model based on this relationship to the criterion will be presented. The fourth model indicates how differing management specialties (i.e., functional requirements of the jobs for which candidate recommendations

were made), moderate the relationship of the personality predictors to the criterion.

Pooled sample model. The first set of hypotheses focused on the personality characteristics that were expected to be important for psychologists' recommendations across all management jobs. In order of importance, Human Relations Skills, Work Motivation, Conceptual Skills, and Emotional Adjustment were expected to be important for most management jobs, although the degree of importance was expected to vary as a function of job type. Adaptability to change and Vitality, although expected to be somewhat important across jobs, were expected to vary with job type. The Autonomous Action Factor (before splitting) was difficult to make predictions about due to some conflicting items with which it was composed. For example, risk taking orientation was expected to vary in importance with job type. Yet, such items as independence and self-confidence were expected to be important for any managerial job candidate.

Table 24 shows both the standardized regression and partial correlation coefficients resulting from the regression of the recommendation criterion on the set of twelve personality predictors. All but Emotional Adjustment and Social Facility were significant in their ability to account for variance in psychologists' recommendations regarding the pooled sample of manager candidates.

The two factor based dimensions (Autonomous Action and Conceptual Skills) which earlier (see Table 15) were found to be unrelated to the criterion, significantly predicted psychologists' recommendations after being split on the basis of the sign of the relationships of

Table 24

Standardized Regression and Partial Correlation Coefficients

Obtained from the Regression of the Recommendation Criterion

on the Personality Predictors Alone

Predictor	Betas	Partial Correlation
Human Relations	.26****	.22****
Decisive Independence	.28****	.22****
Power/Risk Orientation	-.24****	-.19****
Conceptual Problem Solving	.18***	.16***
Tolerance for Uncertainty	-.13*	-.10*
Work Motivation	.17***	.17***
Emotional Adjustment	.07	.07
Vitality	.11**	.13**
Organizational Scope	.10*	.11*
Social Facility	-.05	-.06
Leadership	.10*	.10*
Adaptability	.19***	.16***

*p<.05.   **p<.01.   ***p<.001.   ****p<.0001.

their components with the criterion. The two scales derived from the Autonomous Action Factor (i.e., Decisive Independence and Power/Risk Orientation) were both highly significant and, as expected, held opposite directional relationships to the recommendation criterion. Similarly, Conceptual Problem Solving and Tolerance for Uncertainty (i.e., the two scales derived from the Conceptual Skills Factor) were also significantly and differentially related to the criterion.

Psychologists were found to give the greatest weight (in terms of their regression weights) in their recommendations to Decisive Independence, Human Relations Skills, a low level of Risk/Power Orientation, Adaptability, Conceptual Problem Solving, and Work Motivation. Of somewhat less importance, but still significant, was amanager candidate's assessed level on Vitality, Leadership Ability, and Organizational Scope. Across all candidates, low scores on Tolerance for Uncertainty were associated with psychologists' recommendations.

Supervision model. When differing demands of supervisory and nonsupervisory jobs were considered, Leadership Ability and Broad Scope Thinking were particularly hypothesized to be related to the recommendations made for supervisors. While work motivation was expected to be important for both supervisors and nonsupervisors, higher scores on this factor were hypothesized for the supervisory role. Again, the Autonomous Action Factor presented a dilemma -- some individual items appeared critical for supervisory jobs (e.g., decisiveness, self-confidence, and independence), while expectations regarding the importance of other items comprising the factor were far less certain.

Both the main effects for the personality predictors and the interaction effects for Supervision X Personality are shown in Table 25. The partial correlation coefficients for each of these effects are provided to show the variance accounted for in the criterion, controlling for the effects of other variables. An examination of the main effects in Table 25 indicates that across both supervisors and non-supervisors, many of the same personality dimensions are important to psychologists' recommendations that were found to show significant relationshps to the criterion in Table 24. However, when interaction effects are included in the model, some personality predictors are noteworthy in terms of their shifts in relationship to the criterion. Whereas Vitality accounted for a significant proportion of criterion variance in the model that only considered these main effects, it failsto show a significant main effect across managers when the interaction terms were in the model. Thus, the relationship of scores on Vitality to the recommendation were contingent on whether or not a candidate was a supervisor. Nonsupervisors who scored high on the Vitality Dimension were likely to be recommended, whereas positive recommendations for supervisors were associated with lower scores on this dimension.

Job level model. Expectations regarding the moderating effects of job level were particularly focused on the Conceptual Skills, Organizational Scope, and Adaptability Factors. Each was expected to increase in importance with job level. However, predictions regarding the Conceptual Skills factor were complicated by having different expectations for subsets of items within the factor. As an example,

Table 25

Partial Correlation Coefficients

Resulting from Hierarchical Regression Analysis

When Supervisory Responsibility Moderates Personality Predictors

Predictor	Main Effects	Interaction Effects (Trait X Supervision)
Age	.03	—
Sex	.01	—
Human Relations	.17***	.02
Decisive Independence	.21****	(.05)
Power/Risk Orientation	-.14**	-.04
Conceptual Problem Solving	.13**	-.01
Tolerance for Uncertainty	-.07	-.01
Work Motivation	.16**	(-.00)
Emotional Adjustment	.08+	-.08
Vitality	.03	.15**
Organizational Scope	.14**	-.10+
Social Facility	-.06	.04
Leadership	.11*	-.04
Adaptability	.10*	.05
Supervisory Responsibility[a]	-.03	—

Note. Partial correlation coefficients shown in parentheses did not enter the equation; values shown indicate the partial that would have resulted if the variable were to have entered at the next step.
[a] Supervisors (n = 246) were coded 0. Nonsupervisors (n = 140) were coded 1.
+ $p<.10$. * $p<.05$. ** $p<.01$. *** $p<.001$. **** $p<.0001$.

abstract reasoning, long range thinking, and tolerance for ambiguity were expected to be important for top level managers but not particularly relevant to the requirements of lower level jobs. On the other hand, some of the items related to problem solving (e.g., data gathering skill and deliberation skill) seemed especially appropriate to the demands of lower level management jobs. Leadership ability was a somewhat difficult factor to develop strong expectations about. Because direct supervisory responsibility declines at top levels of management, the ability to direct the activities of others was expected to be more important for lower and middle management candidates.

Although the full empirical model for job level effects was not analyzed in detail due to the failure of the overall F test to achieve significance, the specific a priori hypotheses regarding the interaction of some personality scales with job level were examined. As expected, high scores on Tolerance for Uncertainty were associated with psychologists' recommendations regarding top level managers ($p < .05$), while the reverse relationship tended to hold (although not significantly) for low and middle management candidates. However, when the personality predictors were considered alone (Table 24) across all candidates, Tolerance for Uncertainty was negatively (and significantly) related to the criterion. The relationship between the criterion and interaction effects pertaining to Leadership and levels of management failed to achieve significance. However, the main effect for Leadership was significant ($p < .05$) across management levels.

Job function model. Hypotheses regarding the differential importance of the personality factors to functionally diverse subgroups

were as follows. Although the factor, Human Relations Skills, was expected to be important to all manager candidates, those applying for positions in Human Resources and Development (HRD), or Marketing and Sales (M/S) were expected to require higher scores than other managers. On the other hand, this factor was not expected to be as important for influencing recommendations regarding candidates for jobs in Engineering and Research and Development (R&D). Autonomous Action (prior to splitting this factor) was again difficult to make predictions about. It was expected that recommendations regarding M/S and R&D candidates would be related to higher scores on this factor than the pooled sample of managers. However, an item on this factor such as independence was expected to be positively related to recommendations regarding candidates for Finance/Accounting (F/A) positions, whereas other items such as risk taking orientation or need for autonomy were expected to be negatively related.

It was expected that the Conceptual Skills factor would be particulary important to recommendations regarding HRD, F/A, AND R&D candidates. The cluster of components that eventually were split into the Tolerance for Uncertainty Scale was expected to differentiate HRD, F/A, and GM candidates by the positive relationship of high scores to psychologists' recommendations. On the other hand, the technical and scientific orientations of R&D candidates led to the expectation that a low tolerance for ambiguity and a more structured present focus would be related to recommendations in this group. A similar negative association between the recommendation and the cluster of variables

that became Tolerance for Uncertainty was expected for the Production/ Manufacturing candidates.

No interaction effects were hypothesized for the Work Motivation or Vitality factors and job functions. However, it was expected that HRD candidates scoring higher on Emotional Adjustment and Broad Scope Thinking would have a higher probability of being recommended. Leadership ability was expected to be unrelated (or negatively related) to the criterion for M/S and HRD candidates, but positively associated with recommendations made for GM candidates. Recommended candidates for M/S, HRD, and GM positions were expected to show higher scores on Adaptability than other functional subgroups.

Table 26 shows the partial correlation coefficients of the main effects for the personality predictors and the interaction effects (Personality X Job Function) resulting from Step 4 of the hierarchical regression analysis. Because of the large number of cross product terms that were entered simultaneously at this step, the intercorrelations among variables resulted in some not entering the equation after the effects of other variables (in accounting for criterion variance) were partialled. However, for the sake of providing a more complete model, the partial correlation coefficient for an interaction term, were it to be entered at the next step, has been shown in Table 26 enclosed in parentheses (to distinguish it from other effects in the equation).

As expected, the Human Relations scale was important across functional subgroups. Over and beyond the importance of the scale for other candidates, high scores in the M/S subgroup were associated with

Table 26

Partial Correlation Coefficients

Resulting from Hierarchical Regression Analysis

When Personality Predictors Were Moderated by Job Functions

Predictor	Main Effects	Interaction Effects (Trait X Function)					
		M/S	HRD	F/A	R&D	P/MFG	GM
$\underline{n}$ =	394	163	23	71	27	67	28
Human Relations	.16**	.10[+]	.01	.02	(−.01)	−.03	−.11*
Decisive Independence	.15**	(.02)	(.01)	(.11*)	(.01)	(−.05)	(−.02)
Risk/Power Orientation	−.09[+]	.06	(.04)	−.12*	.13**	−.09	.01
Conceptual Problem Solving	.18***	(.11*)	(.13*)	(.01)	(.02)	(−.02)	.01
Tolerance for Uncertainty	−.15**	.08	(.18***)	.12*	−.06	.02	(.12*)
Work Motivation	.19***	.06	(.07)	−.01	(.00)	(−.02)	(.03)
Emotional Adjustment	.01	.04	.11*	−.10[+]	.06	.10[+]	−.08
Vitality	.04	.07	.02	−.02	.02	.06	(.03)
Organizational Scope	.14**	−.08	.11*	−.11*	−.01	−.09	.04
Social Facility	−.05	−.03	(.10[+])	.02	−.05	.07	.05
Leadership	.10[+]	−.14**	−.19***	.01	.03	.03	.09[+]
Adaptability	.17**	−.08	−.02	.02	−.04	−.01	−.00

Note.   Partial correlation coefficients shown in parentheses did not enter the equation; values shown indicate the partial that would result if the variable were to enter at the next step.
M/S = Marketing/Sales.
HRD = Human Resources Development & Personnel.
F/A = Finance/Accounting.
R&D = Research & Development/Engineering.
P/MFG = Production/Manufacturing.
GM   = General Management.
[+]$\underline{p}$ <.10.   *$\underline{p}$ <.05.   **$\underline{p}$ <.01.   ***$\underline{p}$ <.001.

psychologists' recommendations. However, contrary to expectations, HRD candidates' recommendations were not significantly related to high scores on Human Relations Skills beyond its importance to the pooled sample of candidates. General management (GM) candidates were not hypothesized to differ from the pooled sample on this scale; however, lower scores on Human Relations were related to recommendations in this group.

Hypotheses regarding the two scales derived from the Autonomous Action factor (Decisive Independence [DI] and Risk/Power Orientation [R/P]) were fully confirmed for the F/A candidates. Although a significant main effect for DI was obtained across all candidate groups, additional variance in the criterion was significantly accounted for by F/A candidates scoring high on this scale. Further, low scores in the F/A subgroup on the R/P scale were associated with recommendations, as expected. Whereas a tendency to take risks and to seek power and autonomy (R/P scale) was negatively related to psychologists' recommendations for F/A candidates, the reverse relationship held for candidates in R&D. As hypothesized, such characteristics of R&D candidates were positively associated with the criterion.

More than other functional subgroups, recommendations regarding candidates for M/S positions were expected to be positively related to both DI and R/P. While the interaction terms in both cases indicated positive relationships to the criterion, they did not account for a significant proportion of the variance in psychologists' recommendations.

A highly significant main effect for Conceptual Problem Solving (CPS) was found. In addition, the significant interaction effects for M/S and HRD candidates with this scale indicate that high scores were of even greater importance for these two subgroups than for the other subgroups combined. This was in accordance with expectations for the HRD but not the M/S interactions. The hypothesis that the CPS scale would show a greater relationship to the criterion in the F/A and R&D candidate subgroups than in the pooled management sample was not supported.

Hypotheses regarding the relationship of the criterion to the interaction of Tolerance for Uncertainty (TU) with the HRD, F/A AND GM subgroups were supported. Whereas higher scores were associated with recommendations for these three subgroups compared to all others, the significant main effect for TU indicated that the criterion was in general negatively related to scores on this personality dimension. The R&D and P/MFG did not differ from other subgroups combined in this respect.

Only the main effect for Work Motivation was significantly related to the criterion, as hypothesized. Neither the main nor interaction effects employing Vitality or Social Facility achieved significance at $p < .05$. However, there was some indication ($p < .10$) that higher scores on Social Facility differentiated HRD candidates from others in psychologists' recommendations. This was in accordance with expectations.

The expectation that Emotional Adjustment and Broad Scope (viz., Organization Scope) would be more important predictors for HRD than

other functional subgroups combined was supported. Unexpectedly, however, low scores on Scope were associated with recommendations in the F/A subgroup.

Leadership Ability was expected to be of least importance to recommendations made for M/S and HRD candidates. Whereas this dimension was positively related to criterion across all manager candidates, it was negatively related to the criterion in these two subgroups. Beyond the main effect for Leadership, the interaction effect for the GM subgroup indicated ($\underline{p}$ <.10) that strong Leadership Ability was an important predictor for this subgroup relative to others.

Other than a significant main effect for Adaptability, none of the subgroup interaction effects achieved significance in accounting for criterion variance. Thus, expectations were not supported regarding the greater importance of this dimension to M/S, HRD, and GM subgroups relative to others. Across all management groups, this dimension was found to be strongly related to psychologists' recommendations.

In summary, the hierarchical regression analyses supported the prediction of psychologists' recommendation policies being contingent on their consideration of differing job requirements. This was particularly the case for differentiating supervisory versus nonsupervisory positions and for other diverse management specializations of job function. In general, many of the more specific expectations regarding the ways the set of personality predictors would be moderated in psychologists' recommendations by candidates' memberships in various job subgroups were supported. The next chapter will further summarize

and address the implications of these findings for the validation of psychologists' recommendation policies.

CHAPTER VI

DISCUSSION

This study largely confirmed the major hypotheses of the construct validity of the clinical appraisal approach used by psychologists to recommend candidates for management jobs. As predicted, psychologists' recommendations were not related to such demographic characteristics of candidates as age or sex. Also as predicted, ten of twelve dimensionally reduced personality scales significantly explained more than half the variance (52%) in psychologists' recommendations across the pooled sample of management candidates. This was true despite problems of restriction of range on the criterion measure (80% of the candidates were recommended).

Also, as expected, consideration of differing job dimensions moderated psychologists' recommendation policies. A hierarchical regression analysis showed that the inclusion of interaction terms representing the relationship between personality predictors and supervisory versus nonsupervisory job demands significantly increased the amount of variance explained in psychologists' recommendations. The specific functions of the jobs for which candidates were being considered (e.g., sales, personnel, etc.) were also found to moderate the importance of the personality dimensions in psychologists' recommendations. Although candidates' level in the management hierarchy did

not significantly moderate the relative importance of the personality dimensions in this study, some possible reasons for the failure to find this effect and some potential directions for future research efforts will be discussed later.

Personality Dimensions Important to Management Jobs

Across all management jobs, psychologists' recommendations were related to the following personality dimensions (in order of importance): decisive independence, human relations skills, low risk and power orientation, work motivation, conceptual problem solving skills, adaptability to change, vitality, organizational scope, leadership ability, and low tolerance for uncertainty. Although emotional adjustment was not significantly related to recommendations across all managers, it tended to be related to the criterion in some homogeneous subgroups of manager candidates (e.g., Human Resources and Development, Finance/Accounting, and Production/Manufacturing). Only social facility failed to account for a significant proportion of variance in the criterion; however, it approached significance (p <.10) in the group of candidates seeking positions in Human Resources and Development.

In the next section, the importance of each of the personality dimensions used in the present study will be compared and contrasted with predictors of management effectiveness reported by other researchers. Next, the specific predictors having differential importance to psychologists when evaluating candidates for different types of jobs will be discussed in the light of available information regarding the corresponding requirements of the job subgroups.

Comparisons to Predictors of Effectiveness in Other Studies

Human relations skills and work motivation were two of the most important predictors of psychologists' recommendations found in this study. Similarly, Ulrich and Trumbo (1965) found that the two variables that heavily contribute to interviewer decisions and show greatest evidence of validity were personal relations and motivation to work. To a great degree these two dimensions are also quite comparable to the two factors (e.g., consideration and initiation of structure) emerging from factor analyses of leader behaviors conducted at Ohio State University and at the University of Michigan (see Bass, 1981 for a review). The fact that the two comparable dimensions used in this study were also heavily weighted in psychologists' recommendations provides support for the construct validity of these recommendations.

Although human relations skills and work motivation are clearly important predictors, there is evidence that a more complex set of predictors are needed to make discriminations regarding manager or candidate effectiveness. For example, eleven of the twelve personality characteristics used to model psychologists' policies in this study have their counterpart among the frequently occurring factors predictive of effectiveness noted by Stogdill and Bass (1981) in summaries of the literature. Furthermore, the only variable not mentioned by Bass (1981), adaptability to change, was singled out as an important predictor by Korman (1968) in his review of the literature on the prediction of management effectiveness. He concluded that adaptability to change, and to changing standards of effectiveness criteria, may be a prime factor that judges implicitly incorporate into their evalu-

ations of future effectiveness. In the present investigation, adaptability was made an explicit predictor and did indeed show a strong relationship to psychologists' recommendations.

In a recent follow-up summary of the factor dimensions found in the AT&T Management Progress Study to be most related to success, Bray (1982) named administrative and leadership skills (more specifically, interpersonal skills on which leadership loaded), intellectual ability, work motivation, career orientation, stability of performance, and independence from others. All of these factors, excepting career orientation, have their counterpart in the personality dimensions found to be relevant in the current study. Although career orientation did not emerge as a separate dimension in this study, a somewhat similar variable, commitment to self-development, was positively related to psychologists' recommendations. However, commitment to self-development was not kept as a separate predictor dimension because its relationship to the criterion was similar to Human Relations Skills (on which it also loaded).

The AT&T assessment center dimensions included a factor (stability of performance) that is similar to the emotional adjustment dimension used as a predictor in the present study. Whereas AT&T's stability of performance variable was a significant predictor of entry level managers' subsequent progress, emotional adjustment was only weighted in psychologists' recommendations for a few of the functional subgroups examined in this study. In support of its differential and variable nature as a predictor, Bass (1981) concluded that the rela-

tionship of emotional balance to effectiveness was less determinate than other personality predictors in the 163 studies he reviewed.

The personality dimensions weighted by psychologists in this study are generally quite comparable to those found by other researchers (e.g., Ghiselli, 1971, Boyatzis, 1982), as well. The few variations that occurred are relatively minimal. For example, Ghiselli (1971) found decisiveness to be an important predictor, whereas Bray and his colleagues (Bray, 1964, 1982; Bray et al, 1974; Bray & Grant, 1966; Grant & Bray, 1969) found lack of dependency to be an important indicator of success. Both these variables loaded on the same factor in the present investigation and were predictive of recommendations both singly and as components of the decisive independence personality scale.

Bass (1981) indicated that although mental ability was a fair predictor in lower to middle management candidates, it declined in its ability to discriminate effectiveness at higher levels of management. The AT&T studies also found general ability in their entry level managers to be a good predictor of progress, particularly in the noncollege sample. In the present study, however, intelligence was dropped as a separate predictor for failing to significantly explain variance in psychologists' recommendations. In understanding these results, it should be recalled that the candidates evaluated by psychologists in this study were a preselected group (i.e., by the client companies) spanning all levels of management (not just entry as in the AT&T study). This may explain why only the broader dimension of

conceptual problem solving skills (which included general mental ability) was significantly related to recommendations in this study.

Although human relations skills were consistently found to be important predictors in both this and other investigations, social facility was negatively related to psychologists' recommendations in this study. Somewhat similarly, both the AT&T studies (see e.g., Bray, 1982) and the McBer & Company studies (Boyatzis, 1982) found that affiliativeness or affability were somewhat related to ineffectiveness.

Likewise, risk taking orientation and the need for power or control over others was negatively related to psychologists' recommendations for the pooled sample of managers in this study. Similarly, the McBer & Company findings (Boyatzis, 1982) suggested that "unilateral power" was differentially relevant only at entry levels of management.

Summary. In general, the predictors found to be important to psychologists across all management jobs are quite comparable to the variables found by other researchers to be predictive of effectiveness. This convergence of results lends consensual validity to the policies that have been delineated here. In the next section, the differential weighting of personality dimensions as a function of job type will be discussed.

Differential Importance of Personality Dimensions for Supervisors and Nonsupervisors

Consideration of the interactions between the personality predictors and whether or not the job sought by a candidate included supervisory responsibility increased the variance explained in the

recommendation criterion by a statistically significant 3%. Although the increase in explained variance was not great, the shift in the relative importance of the personality dimensions is more noteworthy. Whereas recommendations across the pooled sample of candidates were significantly related to Vitality (which included energy and drive), in the hierarchical regression analysis this personality dimension explained a significant proportion of variance in psychologists' policies only for nonsupervisors. Supervisors who were recommended tended to score higher on organizational scope than their nonsupervisor counterparts. Common to both supervisors and nonsupervisors alike, psychologists based their recommendations (in order of importance) on decisive independence, human relations skills, work motivation, lower ratings of risk and power orientation, organizational scope, conceptual problem solving, leadership ability, and adaptability to change.

The ability to direct the activity of subordinates, carry out tasks responsibly, and to demonstrate company loyalty has been noted by a number of researchers (e.g., Borman, 1973; Ghiselli & Barthol, 1956; Sartain & Baker, 1978) as critical to the work of supervisory personnel. In this investigation, psychologists considered the related concepts of leadership ability and work motivation to be important to both supervisors and nonsupervisors. Indeed, in the studies which I reviewed, these two functional roles were not contrasted. Rather, effectiveness within supervisors was the criterion variable of interest. While it is logically consistent that supervisor recommendations would be more heavily weighted on organizational scope and nonsupervisors' on vitality, it would be of interest for future research to

determine the specific job demands can be linked to these differentiations.

Personality Dimensions Moderated by Job Function

Psychologists recommendations were also moderated by the specific functions of the jobs for which candidates were evaluated. An additional 10% of the variance in recommendations was explained by the set of interactions between personality dimensions and job functions. Seven personality dimensions showed significant main effects across job functions. In order of importance these were: work motivation, conceptual problem solving, adaptability to change, human relations skills, decisive independence, lack of tolerance for uncertainty or ambiguity, and organizational scope. The shifts in recommendation policies which occurred for each of the separate functional subgroups is presented next.

Sales and marketing jobs. In contrast to the pooled management group, recommended sales and marketing candidates were characterized by lower scores on leadership and higher than typical scores on conceptual problem solving and human relations skills. Insofar as marketing and sales jobs are less likely than many others to involve the direct supervision of others (see e.g., Tornow & Pinto, 1976), the finding that low leadership ability is associated with the perceived suitability of candidates for these jobs lends support to the validity of this recommendation policy. According to Tornow and Pinto (1976), the marketing and sales cluster of jobs was primarily characterized by public and customer relations activities (see Table 4). These activi-

ties are logically consistent with the emphasis given problem solving and human relations skills in psychologists' recommendations.

Human resources and development jobs. Recommendations made regarding candidates for positions in Human Resources and Development (HRD) were related to low scores on leadership and high scores on tolerance for uncertainty or ambiguity, conceptual problem solving, emotional adjustment, and organizational scope. As noted above, somewhat higher scores on social facility also tended to differentiate this group of candidates from all other candidates recommended for other positions. According to Tornow and Pinto (1976), personnel jobs (which make up the bulk of the positions found within the HRD category of this study) involve the following activities (in order of importance): broad personnel responsibility; lack of direct concern with products and services; product, marketing, and/or financial strategy planning; and coordination of other organizational units and personnel without direct control. Each of these job demands are completely consistent with the personality dimensions found to be related to psychologists' recommendations for this subgroup.

Jobs in finance or accounting. The model for psychologists' recommendations regarding candidates for positions in finance or accounting (F/A) was as follows: high scores on tolerance for uncertainty or ambiguity, low risk and power orientation, lower than typical scores on organizational scope, high scores on decisive independence, and somewhat lower than typical scores on emotional adjustment. Tornow and Pinto (1976) did not specify the job demands for F/A jobs. However, one may speculate about the requirements of this cluster of

jobs using their 13 factor dimensions of job activities. It is likely that this group's responsibilities include: internal business control, allocation of resources, budgeting, goal setting, etc.; financial strategy planning; advanced financial responsibility; advanced consulting involving technical expertise; complexity and stress; and lack of autonomy of action and decision making. With the exception of lower than usual scores on organizational scope and emotional adjustment, all other weighted personality dimensions appear quite consistent with the probable job demands made of finance and accounting positions.

Jobs in engineering or research and development. Psychologists' recommendations regarding candidates for positions in engineering or research and development were weighted in favor of high scores on risk/power orientation. This was the only subgroup with high scores on this dimension which also encompasses such single traits as need for autonomy, assertiveness, and individual initiative. Relative to other functional subgroups, psychologists apparently perceive engineers, scientists, and other research oriented positions to demand a more adventurous autonomy and need for control. As Kuhn (1970) has pointed out in his book The Structure of Scientific Revolutions, major advances in science have always involved what he calls "paradigm-shifts," the imposition of a totally new conceptual framework on findings and data that had become increasingly difficult to deal with within the old framework. It is perhaps the motivational quality needed to make such paradigm-shifts that psychologists are at least implicitly attempting to capture by weighing the risk/power personality dimension in their recommendations for this functional subgroup.

Jobs in production or manufacturing. The production/manufactur-
ing subgroup did not differ to any great degree from the pooled sample
of managers with respect to the personality dimensions weighted in
psychologists' recommendations. However, emotional adjustment ap-
proached significance as an important predictor for this group.
Because of the variety of products and activities subsumed under this
heading across client companies, too great a heterogeneity may have
existed in the sample for a clearcut recommendation policy to be
detected.

General management jobs. Two personality dimensions particu-
larly distinguished general managers from others in the weights given
in psychologists' recommendations. As expected from the complexity of
general managers' jobs described by a number of researchers (e.g.,
Kotter, 1982a, 1982b; Levinson, 1980), recommendations for this group
were related to high scores on tolerance for uncertainty and ambiguity.
More noteworthy was the finding that lower than typical scores on human
relations skills were associated with recommendations for this group.
However, leadership ability was weighted strongly (beyond what was
important across all managers), and general manager recommendations
were also more frequently associated with high social facility scores
than were recommendations for the average management candidate.
Apparently psychologists perceive general managers to require interper-
sonal skills specific to leadership and impression management func-
tions, but not to require the kind of other-oriented skills that
comprised the human relations scale in this study.

Candidates' Level in the Organizational Hierarchy

The present investigation failed to obtain a significant moderating effect on the relative importance of the personality dimensions as a function of job level. It is possible, however, that level effects may have been demonstrated within a functional sub-grouping of manager candidates had there been sufficient statistical power to adequately test the effect. Following this hunch, the sample of candidates was separated into supervisors and nonsupervisors, and each of these groups was examined separately using the four step procedure of entering sets of research variables (i.e., demographic, personality dimensions, job level, and level by personality dimension cross product terms). Reasoning that supervisors (as part of the operational chain of command) would be more likely than nonsupervisors (whose jobs more frequently would consist of either sales or staff support functions) to show differential weighting of personality dimensions as a function of job level, the significance of the change in R^2 at step four of the regression analysis was examined. Although the change in R^2 resulting from the moderating effects of job level achieved statistical significance for neither group, the set of personality X job level interactions accounted for an additional 4% of the variance in psychologists' recommendations in the supervisor group. Furthermore, the change in R^2 for supervisors approached significance, F for change in R^2 (16,224) = 1.43, p = .12. On the other hand, the set of interactions between job levels and personality dimensions within the nonsupervisor group in no way approached significance, F for change in R^2 (11,123) = .99, p = .45. Given the increased potential

for Type II error resulting from the inadequate sample sizes which were used in these analyses, future research efforts might profitably examine the influence of job level effects within a larger sample of candidates with line (i.e., chain of command) responsibilities.

Another possible reason that level effects were not demonstrated in this study may involve the diverse nature of the organizations for which candidates were evaluated. Because of blind coding of data on organizations, no controls for size, type of industry, or primary business focus were possible. Yet, these factors may have a differential effect on how psychologists weigh personality dimensions as a function of job level.

One other possible reason for the failure to obtain level effects may pertain to the set of personality dimensions themselves. It is quite possible that a different dimensional structure should be used to capture differing recommendation policies as a function of job level. This possibility receives support from the finding that explicit reference to 13 of the original 55 traits varied in psychologists' reports as a function of job level. This point is further explored in the next section.

Reliability and Relevance of the Individual Predictor Variables

Despite the inferential nature of the task and the large number of variables that were rated by coders from a reading of psychologists' reports, intercoder reliabilities were generally quite acceptable (median r = .72). Indeed, coder agreement was comparable to that obtained by other researchers (e.g., Dicken & Black, 1965; Grant & Bray, 1969) using far fewer variables.

Although the inclusion of so large a set of variables considerably added to coding time, the transformation of reports into a set of rated characteristics more closely approximated a content analysis than has been the case in other studies. Furthermore, the use of additional ratings of the confidence with which coders rated the trait variables permitted an empirical evaluation of varying degrees of coder inference on agreement. Although agreement was found to be generally higher when reports made explicit reference to a trait (median r = .82), the difference was not sufficiently great under inferential rating circumstances to justify the loss in statistical power that would result from deleting traits that were not explicitly mentioned in psychologists' reports.

Although an empirical examination of the differential effects of coder confidence on reliability led to the conclusion that a larger number of cases could be used in subsequent factor and regression analysis without undue attentuation of the correlation coefficients, another benefit also resulted. Examination of the proportion of cases rated with high confidence on each trait permitted an empirical determination of the trait variables having relevance to psychologists writing reports. Thus, the finding that two of the traits originally coded were so infrequently used by psychologists that their inclusion was questionable undoubtedly improved specification of independent variables to include in the factor analyses.

The examination of high confidence ratings also made possible an analysis of differential use of traits in describing candidates for different types of management jobs. One question that arises is

whether different sets of predictors should be used for recommendations regarding different homogeneous subgroups of candidates. As noted by Borman (1978), validity coefficients obtained in predictive studies are not only limited by lack of interrater agreement, but also by the differing personal constructs raters had regarding job relevant behavior. The fact that 13 of the original 55 traits were found to be used differentially in describing three levels of management candidates suggests that a different model of personality predictors might have been more appropriate in assessing the moderating effects of job level on psychologists' recommendation policies than was the single set of dimensions derived from a factor analysis of the pooled sample of candidates. Future research efforts could be directed at the use of simultaneous COFAMM (Jöreskog, 1971) to determine whether (1) the model identified by the present study fits each subgroup equally well or (2) separate models are warranted for each subgroup.

Dimensional Nature of the Personality Predictors

The twelve dimensions of personality derived in this study suggest that the structure necessary to capture the differential policies used to arrive at psychologists' recommendations is more complex than either (1) the a priori conceptual framework used by psychologists in the firm to organize their judgments regarding candidates or (2) the model that would be derived from a factor analysis alone. It is particularly interesting to note that the factor analytic model alone was insufficient to capture the complexity of psychologists' differential recommendation policies. Just because clusters of variables are highly intercorrelated and load on a single

factor does not insure that they will all relate identically to a criterion measure. Indeed, the opposite directional relationships of clusters of variables to the criterion, which were found within the Autonomous Action and Conceptual Skills factors (Factors 1 and 2) resulted in their failure to explain a significant proportion of variance in psychologists' recommendations. Not until the factors were split into subscales was the relative importance of the clusters of variables to psychologists' differential recommendation policies found for either the pooled or subgroup samples of candidates. One implication of this result is that overly parsimonious models of predictor variables may fail to capture the discrimating nature of psychologists' judgments, which may in turn produce attenuated relationships with criterion variables.

Comparisons of the Dimensional Structure to Other Structural Models

Models of management potential. With one notable exception, the structural model in this study bore considerable similarity to the model derived from the factor analysis of assessment center ratings done by Bray and his associates at AT&T (Bray, 1964, 1982; Bray et al, 1974; Bray & Grant, 1966). In the AT&T study, more than half of the variance in the ratings was accounted for by one to three global factors interpreted to reflect the assessment staff's overall prediction of managerial potential. Yet, this global rater factor has been the source of criticism (e.g., Sackett & Dreher, 1982; Klimoski & Strickland, 1977) that assessment center ratings do not measure the intended constructs but, instead, simply achieve high predictive

validities because the same rater halo effect that is captured at the time of the original assessment also leads a manager to advance.

No generalized rater halo or global factor was extracted in the present investigation. This suggests that psychologists were making discriminating judgments rather than being guided by an overall impression of a candidate. While this attests to the construct validity of their appraisal method, it of course remains for future investigations to examine the predictive validity of these constructs to on-the-job performance and effectiveness.

Models of normal personality. Goldberg (1981) has suggested that "any model for structuring individual differences will have to encompass -- at some level of abstraction -- something like ...[Norman's, 1963] ... 'big five' dimensions" of normal personality (p. 159). The overall nature (although not the labels) of these five dimensions bears considerable similarity to the first five factors extracted in this investigation. The first of Norman's (1963) big five, surgency, bears some similarity to the Autonomous Action Factor of this study. The second, agreeableness, bears similarity to the Human Relations Skills Factor. The third, conscientiousness, has its counterpart in the current study to the Work Motivation Factor. The fourth, emotional stability, is very similar to the Emotional Adjustment Factor. The fifth dimension delineated by Norman (1963) was called Culture but actually consists of variables relating to cognitive and creative skills, namely, the types of components making up the Conceptual Skills Factor. The comparability of the factor structure of the ratings used by psychologists in this study to the structure repeatedly found by

personality theorists provides additional evidence of the construct validity of the psychologists' assessment approach.

Person Perception "Stereotypes"

Following the lead of Webster (1964), numerous researchers (e.g., Hakel, 1971, Hakel, Hollman & Dunnett, 1970; London & Hakel, 1974, Mayfield & Carlson, 1966; Rowe, 1963; Sydiaka, 1959, 1962) have suggested that a generalized model regarding applicants for jobs may be conceptualized as a "stereotype" of an ideal applicant. Yet, when job information was used to modify such a generalized model, Osburn, Timmreck, and Bigby (1981) determined that higher interviewer agreement and more accurate discriminations between more and less qualified applicants was possible. As we have seen, the model of psychologists' recommendations regarding the pooled sample of candidates in this study was moderated by differing job types. Furthermore, these modifications and the personality dimensions found to be relevant to the recommendations for different subgroups of managers were in conformity with what we know about the requirements of these jobs.

Where Do We Go From Here?

As noted earlier, structured interviews, in which a set of rating dimensions are specified in advance, have been found to result in both the highest reliabilities and predictive validities for a variety of effectiveness criteria (see e.g., Schwab & Heneman, 1969; Carlson, Schwab & Heneman, 1970). It might, therefore, be valuable for psychologists employing the clinical appraisal approach to more deliberately and systematically assess candidates on the dimensions of personality found in this study to account for the variance in their

recommendations. Indeed, the use of a scale to rate candidates on these dimensions at the time of the interview would make possible finer discriminations than were possible via the second hand transformation of narrative reports used in this study. In addition, the potential increase in explained variance that might be achieved by having the interviewing psychologist also rate candidate suitability might enable more sensitive predictions to be made than was possible with the recommendation codes used in the current investigation.

Although hypotheses in this investigation were formulated and tested regarding the personality predictor variables that would be important in psychologists' recommendation decisions, this study was also exploratory. Based on the results of this investigation, future research efforts might profitably be directed at the development of more specific recommendation models tailored to different homogeneous subgroupings of management jobs.

In this investigation, jobs were grouped on an a priori basis using operational definitions to distinguish jobs along the dimensions of supervisory responsibilities, functional titles, and organizational levels. However, there is no assurance that job demands within the resulting subgroups are truly homogeneous. Another research approach that could be taken involves examining the demands existing in different jobs which lead psychologists to differentially weigh personality factors. Some strides have been made in identifying the dimensions on which job families differ from one another. A canonical correlation approach could be employed to simultaneously examine the linkages which would results from candidates being rated on both the set of personal-

ity dimensions derived in this study plus a set of critical job demands.

Some sort of independent concurrent validation of psychologists' assessments of candidates is still needed to determine the relationship between the perceived importance of personality dimensions and actual on-the-job performance. The difficulty remains as to the best measure to use for such validation efforts. Self-ratings, peer ratings, and supervisors' ratings have each been used with varying degree of methodological problems. However, the multi-trait multi-method matrix design proposed by Campbell and Fiske (1959) has proven promising for demonstrating both convergent and discriminant validity. With a better sense of the predictor variables to employ in the model for different types of managers, plus a variety of judges' ratings, even stronger evidence of the validity of the clinical appraisal method used by psychologists to evaluate manager candidates may be achieved.

The generalizability of the findings from this study regarding the recommendation policies used by psychologists to clinically appraise candidates for management jobs is, in the strictest sense, limited to the one consulting firm which was the source of data in this study. However, no other investigation of this approach has approximated the large number of geographically dispersed psychologists who provided data for this investigation. Also, the diversity of candidates, jobs, and client companies lends some support to the external validity of the results presented here.

In summary, this investigation has increased our understanding of the policies used by psychologists charged with making recommenda-

tions regarding management candidates. Support for the construct validity of the clinical appraisal approach has been provided, both in terms of the personality dimensions on which recommendations are based and the logical consistency with which these dimensions are moderated by differing job demands. A number of suggestions for future research directions to build on these findings have also been proposed.

REFERENCES

Albrecht, P., Glaser, E. M., & Marks, J. (1964). Validation of a multiple-assessment procedure for managerial personnel. *Journal of Applied Psychology*, 48, 351-360.

American Psychological Association. (1954). *Technical recommendations for psychological tests and diagnostic techniques*. Washington, D.C.: Author.

American Psychological Association, American Educational Research Association, & National Council on Measurement in Education. (1966). *Standards for educational and psychological tests*. Washington, D.C.: American Psychological Association.

American Psychological Association, American Educational Research Association, & National Council on Measurement in Education. (1974). *Standards for educational and psychological tests*. Washington, D.C.: American Psychological Association.

American Psychological Association, Division of Industrial and Organizational Psychology. (1980). *Principles for validation and use of personnel selection procedures (2nd ed.)*. Berkeley, CA: Author.

American Psychological Association, Division of Industrial and Organizational Psychology. (1982). *Draft of the Joint Technical Standards*, Draft of a paper presented at the Division 14 business session at the meeting of the American Psychological Association, Washington, D.C.

Anderson, N. H. (1968). A simple model for information integration. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberg, & P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A Sourcebook*. Chicago: Rand McNally.

Arvey, R. D., & Campion, J. E. (1982). The employment interview: A summary and review of recent research. *Personnel Psychology*, 35, 281-322.

Atkinson, J. W. (Ed.). (1958). *Motives in fantasy, action, and society*. Princeton, NJ: Van Nostrand.

Balma, J. J. (1959). The concept of synthetic validity. *Personnel Psychology*, 12, 395-396.

Bare, R. (1956). A factor analytic description of the performance of enlisted personnel. USN Bureau of Naval Personnel Technical Bulletin (56-1), 1-37.

Bass, B. M. (Ed.). (1981). Stogdill's handbook of leadership: A survey of theory and research. New York: The Free Press.

Bieri, J., Atkins, A. L., Briar, S. Leaman, R. L., Miller, H., & Tripodi, T. (1966). Clinical and social judgment: The discrimination of behavioral information. New York: John Wiley & Sons.

Bolster, B. I., & Springbett, B. M. (1961). The reaction of interviewers to favorable and unfavorable information. Journal of Applied Psychology, 14, 97-103.

Borman, W. C. (1973). First line supervisor validation study. Minneapolis: Personnel Decisions, Inc.

Borman, W. C. (1978). Exploring upper limits of reliability and validity in job performance ratings. Journal of Applied Psychology, 63, 135-144.

Bouchard, T. J. (1972, May). A manual for job analysis. Minneapolis: Minnesota Civil Service Commission.

Bourne, E. (1977). Can we describe an individual's personality? Agreement on stereotype versus individual attributes. Journal of Personality and Social Psychology, 35, 863-872.

Bowers, D. G. & Seashore, S. E. (1966). Predicting organizational effectiveness with a four-factor theory of leadership. Administrative Science Quarterly, 11, 441-454.

Boyatzis, R. E. (1982). The competent manager: A model for effective performance. New York: John Wiley & Sons.

Bray, D. W. (1964). The management progress study. American Psychologist, 19, 419-429.

Bray, D. W. (1982). The assessment center and the study of lives. American Psychologist, 37, 180-189.

Bray, D. W., Campbell, R. J., & Grant, D. L. (1974). Formative years in business: A long term AT&T study of managerial lives. New York: John Wiley & Sons.

Bray, D. W., & Grant, D. L. (1966). The assessment center in the measurement of potential for business management. Psychological Monographs, 80 (17, Whole No. 625).

Bruner, J., & Tagiuri, R. (1954). The perception of people. In G. Lindzey (Ed.), Handbook of social psychology (Vol. 2, pp. 634-654). Cambridge, MA: Addison-Wesley.

Brunswik, E. (1955). Representative design and probabilistic theory. Psychological Review, 62, 236-242.

Brunswik, E. (1956). Perception and the representative design of psychological experiments. Berkeley: University of California Press.

Bryant, F. B., & Veroff, J. (1975). The structure of psychological well-being: A sociohistorical analysis. Journal of Personality and Social Psychology, 43, 653-673.

Campbell, J. P. (1976). Psychometric theory. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 185-222). Chicago: Rand McNally.

Campbell, J. P., Dunnette, M. D., Lawler, E. E., III, & Weick, K. E., Jr. (1970). Managerial behavior, performance, and effectiveness. New York: McGraw-Hill.

Campbell, J. T. (1962). Assessments of higher level personnel: I. Background and scope of the research. Personnel Psychology, 15, 57-73.

Campbell, J. T., Otis, J. L., Liske, R. E., & Prien, E. P. (1962). Assessments of higher level personnel: II. Validity of the overall assessment process. Personnel Psychology, 15, 63-74.

Carlson, R. E., Schwab, D. P., & Heneman, H. G. (1970). Agreement among selection interview styles. Journal of Applied Psychology, 5, 8-17.

Cartwright, D., & Zander, A. (1968). Group dynamics. New York: Harper & Row.

Cattell, R. B. (1966). The scree test for the number of factors. Multivariate Behavioral Research, 1, 245-276.

Civil Rights Act of 1964 as amended by the Equal Employment Opportunity Act of 1972 (Public Law 92-261). (1972). Washington, D.C.: U.S. Government Printing Office.

Cohen, J. (1960). A coefficient of agreement for nominal scales. Educational and Psychological Measurement. 20, 37-46.

Cohen, J. (1977). Statistical power analysis for the behavioral sciences (rev. ed.). New York: Academic Press.

Cohen, J., & Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Erlbaum.

Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis issues for field settings. Chicago: Rand McNally.

Creager, J. A., & Harding, F. D. (1958). A hierarchical factor analysis of foremen behavior. Journal of Applied Psychology, 42, 197-203.

Cronbach, L. J., & Gleser, G. C. (1965). Psychological tests and personnel decisions. Urbana: University of Illinois Press.

Cunningham, W. R. (1978). Principles for identifying structural differences. Journal of Gerontology, 33, 82-86.

Dawes, R. M. (1971). A case study of graduate admissions: Application of three principles of human decision making. American Psychologist, 26, 180-188.

Dawes, R. M. (1979). The robust beauty of improper linear models in decision making. American Psychologist, 34, 571-582.

Dawes, R. M., & Corrigan, B. (1974). Linear models in decision making. Psychological Bulletin, 81, 95-106.

DeNelsky, G. Y., & McKee, M. G. (1969). Prediction of job performance from assessment reports. Use of a modified Q-sort technique to expand predictor and criterion variance. Journal of Applied Psychology, 53, 439-445.

Dicken, C. F., & Black, J. D. (1965). Predictive validity of psychometric evaluations of supervisors. Journal of Applied Psychology, 49, 34-37.

Dudycha, A. L., & Naylor, J. C. (1966). The effect of variations in the cue R-matrix upon the obtained policy equations of judges. Educational and Psychological Measurement, 26, 583-603.

Dunnette, M. D. (1971). The assessment of managerial talent. In P. McReynolds (Ed.), Advances in psychological assessment (Vol. 2, pp. 79-108). Palo Alto: Science and Behavior Books.

Dunnette, M. D. (1976). Aptitudes, abilities & skills. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 473-520). Chicago: Rand McNally.

Dunnette, M. D., & Borman, W. C. (1979). Personnel selection and classification systems. Annual Review of Psychology, 30, 477-525.

Ebel, R. L. (1951). Estimation of the reliability of ratings. Psychometrika, 16, 407-424.

Epstein, S. (1983). Aggregation and beyond: Some basic issues on the prediction of behavior. Journal of Personality, 51, 360-392.

Equal Employment Opportunity Commission, Civil Service Commission, Department of Labor, & Department of Justice. (1978). Adoption by four agencies of uniform guidelines on employee selection procedures. Federal Register, 43, 38290-38315.

Equal Employment Opportunity Commission, Office of Personnel Management, Department of Justice, Department of Labor, & Department of the Treasury. (1979). Questions and answers to clarify and provide a common interpretation of the uniform guidelines on employee selection procedures. Federal Register, 44, 11996-12009.

Fine, S. A. (1955). A structure of worker functions. Personnel and Guidance Journal, 34, 66-73.

Finkle, R. B. (1976). Managerial assessment centers. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 861-888). Chicago: Rand McNally.

Fiske, D. W. (1978). Strategies for personality research. San Francisco: Jossey-Bass.

Flanagan, J. C. (1954). The critical incident technique. Psychological Bulletin, 51, 327-349.

Fleishman, E. A. (1967). Performance assessment based on an empirically derived task taxonomy. Human Factors, 9, 349-366.

Fruchter, B., & Skinner, J. A. (1966). Dimensions of leadership in a student cooperative. Multivariate Behavioral Research, 1, 437-445.

Ghiselli, E. E. (1960). Individuality as a factor in the success of management personnel. Personnel Psychology, 13, 1-10.

Ghiselli, E. E. (1971). Explorations in managerial talent. Pacific Palisades, CA: Goodyear.

Ghiselli, E. E., & Barthol, R. P. (1956). Role perceptions of successful and unsuccessful superiors. Journal of Applied Psychology, 40, 241-244.

Goldberg, L. R. (1968). Simple models or simple processes? Some research on clinical judgments. American Psychologist, 23, 438-496.

Goldberg, L. R. (1970). Man versus model of man: A rationale plus evidence for a method of improving clinical inferences. Psychological Bulletin, 73, 422-432.

Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.), Review of Personality and Social Psychology: 2 (pp. 141-165). Beverly Hills, CA: Sage.

Goldberg, L. R. (1982). From ace to zombie: Some explorations in the language of personality. In C. D. Spielberger & J. N. Butcher (Eds.), Advances in personality assessment: Vol. I (pp. 203-234). Hillsdale, NJ: Erlbaum.

Gordon, L. V. (1967). Clinical, psychometric, and work-sample approaches in the prediction of success in Peace Corps training. Journal of Applied Psychology, 51, 111-119.

Gorsuch, R. L. (1974). Factor Analysis. Philadelphia: W. B. Saunders Company.

Grant, D. L. (1955). A factor analysis of manager's ratings. Journal of Applied Psychology, 39, 283-286.

Grant, D. L. (1980, June). Issues in personnel selection. Professional Psychology, 11, 369-384.

Grant, D. L. & Bray, D. W. (1969). Contributions of the interview to the assessment of managerial potential. Journal of Applied Psychology, 53, 24-34.

Guglielmino, P. J. (1979, April). Developing the top-level executive for the 1980s and beyond. Training and Development Journal, 33(4), 12-14.

Guion, R. M. (1976). Recruiting, selection, and job placement. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally.

Guion, R. M. (1980). On trinitarian doctrines of validity. Professional Psychology, 11, 385-398.

Hackman, J. R. (1968). Tasks and task performance in research on stress. In J. E. McGrath (Ed.), Social and psychological factors of stress. New York: Holt, Rinehart, & Winston.

Hakel, M. D. (1971). Similarity of post-interview trait rating intercorrelations as a contributor to interrater agreement in a structured employment interview. Journal of Applied Psychology, 55, 443-448.

Hakel, M. D., & Dunnette, M. D. (1970). Checklists for describing job applicants. Minneapolis: University of Minnesota.

Hakel, M. D., Hollman, T. D., & Dunnette, M. D. (1970). Accuracy of interviewers, C.P.A.'s, and students in identifying the interests of accountants. Journal of Applied Psychology, 54, 115–119.

Hammond, K. R. (1955). Probabilistic functioning in the clinical method. Psychological Review, 62, 255–262.

Hammond, K. R. (Ed.). (1966). The psychology of Egon Brunswik. New York: Holt, Rinehart, & Winston.

Hammond, K. R., Hursch, C. J. & Todd, F. J. (1964). Analyzing the components of clinical inferences. Psychological Review, 71, 438–456.

Harman, H. H. (1976). Modern factor analysis. Chicago: University of Chicago Press.

Hemphill, J. K. (1960). Dimensions of executive positions (Research Monograph No. 89). Columbus: Ohio State University, Bureau of Business Research.

Hilton, A. C., Bolin, S. F., Parker, J. W. Jr., Taylor, E. K., & Walker, W. B. (1955). The validity of personnel assessments by professional psychologists. Journal of Applied Psychology, 39, 287–293.

Hinrichs, J. R. (1978). An eight-year follow-up of a management assessment center. Journal of Applied Psychology, 63, 596–601.

Hoffman, P. J. (1960). The paramorphic representation of clinical judgment. Psychological Bulletin, 57, 116–131.

Hogan, R. (1982). A socioanalytic theory of personality. In M. M. Page (Ed.), Personality – Current theory and research: 1982 Nebraska Symposium on Motivation (pp. 55–89). Lincoln: University of Nebraska Press.

Holt, R. R. (1970). Yet another look at clinical and statistical prediction: Or is clinical psychology worthwhile? American Psychologist, 25, 337–349.

Howell, M.. & Vincent, J. W. (1970). Factor analysis of interview data. Journal of Applied Psychology, 54, 313–315.

Huck, J. R. (1977). The research base. In J. L. Moses & W. C. Byham (Eds.), Applying the assessment center method. New York: Pergamon Press.

Hursch, C. J., Hammond, K. R., & Hursch, J. L. (1964). Some methodological considerations in multiple cue probability studies. Psychological Review, 71, 42-60.

Huse, E. F. (1962). Assessments of higher level personnel: The validity of assessment techniques based on systematically varied information. Personnel Psychology, 15, 195-205.

Jackson, D. N. (1972). A model for inferential accuracy. The Canadian Psychologist, 13, 185-194.

Jackson, D. N., & Paunonen, S. V. (1980). Personality structure and assessment. Annual Review of Psychology, 31, 503-551.

Jackson, D. N., Peacock, A. C., & Smith, J. P. (1980). Impressions of personality in the employment interview. Journal of Personality and Social Psychology, 39, 294-307.

Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. Psychometrika, 36, 409-426.

Jöreskog, K. G., & Lawley, D. N. (1968). New methods in maximum likelihood factor analysis. British Journal of Mathematical and Statistical Psychology, 21, 85-96.

Katz, D., & Kahn, R. L. (1978). The social psychology of organizations (2nd ed.). New York: Wiley.

Kelly, E. L., & Fiske, D. W. (1951). The prediction of performance in clinical psychology. Ann Arbor: University of Michigan Press.

Kim, J., & Mueller, C. W. (1978). Factor analysis. Beverly Hills: Sage.

Kleinmuntz, B. (1967). Personality measurement: An introduction. Homewood, IL: Dorsey Press.

Klemp, G. O., Jr. (Ed.). (1980). The assessment of occupational competence. Report to the National Institute of Education, Washington, D.C.

Klimoski, R. J., & Strickland, W. J. (1977). Assessment centers - valid or merely prescient. Personnel Psychology, 30, 353-361.

Kolb, D. A. (1971). Individual learning styles and the learning process (Working Paper #535-71). Cambridge, MA: Sloan School of Management, Massachusetts Institute of Technology.

Kolb, D. A. (1976). Learning style inventory (Technical Manual). Boston: McBer and Company.

Korman, A. K. (1968). The prediction of managerial performance: A review. Personnel Psychology, 21, 295-322.

Koten, J. (1978, July 11). Psychologists play bigger role in placing of personnel. The Wall Street Journal, pp. 1, 20.

Kotter, J. P. (1982a, Spring). General managers are not generalists. Organizational Dynamics, 10, 5-19.

Kotter, J. P. (1982b, November-December). What effective general managers really do. Harvard Business Review, 156-167.

Kuhn, T. S. (1962). The structure of scientific revolutions. Chicago: University of Chicago Press.

Landy, F. J. (1976). The validity of the interview in police officer selection. Journal of Applied Psychology, 61, 193-198.

Landy, F. J., and Trumbo, D. A. (1980). Psychology of work behavior (rev. ed.). Homewood, IL: The Dorsey Press.

Langdale, J. A., & Weitz, J. (1973). Estimating the influence of job information on interviewer agreement. Journal of Applied Psychology, 57, 23-27.

Lawshe, C. H. (1952). Employee selection. Personnel Psychology, 5, 31-34.

Lay, C. H., & Jackson, D. N. (1969). Analysis of the generality of trait inferential relationships. Journal of Personality and Social Psychology, 12, 12-21.

Lent, R. H., Aurbach, H. A., & Levin, L. S. (1971). Research design and validity assessment. Personnel Psychology, 24, 247-274.

Levinson, H. (1980). Criteria for choosing chief executives. Harvard Business Review, 58(4), 113-120.

Lindzey, G. (1965). Seer versus sign. Journal of Experimental Research in Personality, 1, 17-26.

London, M., & Hakel, M. D. (1974). Effects of applicant stereotypes, order, and information on interview impressions. Journal of Applied Psychology, 59, 159-162.

Mandell, M. M. (1956). Supervisory characteristics and rating: A summary of recent research. Personnel, 32, 435-440.

Marquardt, L. D., & McCormick, E. J. (1972, June). Attribute ratings and profiles of the job elements of the Position Analysis Questionnaire (PAQ). Department of Psychological Sciences, Purdue University (ONR Contract NR 151-231).

Mayfield, E. C. (1964). The selection interview: A reevaluation of published research. Personnel Psychology, 17, 239-260.

Mayfield, E. C., & Carlson, R. E. (1966). Selection interview decisions: First results from a long term research project. Personnel Psychology, 19, 41-54.

McClelland, D. C. (1961). The achieving society. Princeton, NJ: Van Nostrand.

McClelland D. C. (1975). Power: The inner experience. New York: Irvington.

McCormick, E. J. (1959). The development of processes for indirect or synthetic validity (a symposium): III. The application of job analysis to indirect validity. Personnel Psychology, 12, 402-413.

McCormick, E. J. (1976). Job and task analysis. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally.

McCormick, E. J. (1979). Job analysis: Methods and applications. New York: American Management Association.

McCormick, E. J., Cunningham, J. W. & Gordon, C. E. (1967). Job dimensions based on factorial analysis of worker-oriented variables. Personnel Psychology, 20, 417-430.

McCormick, E. J., Jeanneret, P. R. & Mecham, R. C. (1972). A study of job characteristics and job dimensions as based on the Position Analysis Questionnaire (PAQ). Journal of Applied Psychology, 56, 347-368.

McReynolds, P. (1968). An introduction to psychological assessment. In P. McReynolds (Ed.), Advances in psychological assessment (Vol. 1, pp. 1-13). Palo Alto, CA: Science and Behavior Books.

McReynolds, P. (1971). Introduction. In P. McReynolds (Ed.), Advances in psychological assessment (Vol. 2, pp. 1-13). Palo Alto, CA: Science and Behavior Books.

Meehl, P. E. (1954). Clinical versus statistical prediction: A theoretical analysis and a review of the evidence. Minneapolis: University of Minnesota Press.

Meehl, P. E. (1965). Seer over sign: The first good example. Journal of Experimental Research in Personality, 1, 27-32.

Messick, S. A. (1975). Meaning and values in measurement and evaluation. American Psychologist, 30, 955- 956.

Messick, S. A. (1980). Test validity and the ethics of assessment. American Psychologist, 35, 1012-1027.

Miner, J. B. (1970). Psychological evaluations as predictors of consulting success. Personnel Psychology, 23, 393-405.

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

Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. Psychological Review, 80, 252-283.

Mischel, W., & Peake, P. K. (1982). Beyond déjà vu in the search for cross-situational consistency. Psychological Review, 89, 730-755.

Moses, J. L., & Byham, W. C. (Eds.). (1977). Applying the assessment center method. New York: Pergamon Press.

Norman, W. P. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. Journal of Abnormal and Social Psychology, 66, 574-583.

Orwin, R., & Cordray, D. S. (1985). The effects of deficient reporting on meta-analysis: A conceptual framework and reanalysis. Psychological Bulletin, 97, 134-147.

Osburn, H. G., Timmreck, C., & Bigby, D. (1981). Effect of dimensional relevance on accuracy of simulated hiring decisions by employment interviewers. Journal of Applied Psychology, 66, 159-165.

OSS Assessment Staff. (1948). Assessment of men. New York: Rinehart.

Otis, J. L., Campbell, J. T., & Prien, E. P. (1962). Assessment of higher level personnel: VII. The nature of assessments. Personnel Psychology, 15, 441-446.

Page, R. C., Gomez, L. R., & Tornow, W. W. (1982, August). On compensation applications of the Management Position Description Questionnaire. Paper presented in the Division 14 Poster Session at the meeting of the American Psychological Association, Washington, D.C.

Pavett, C. V., & Lau, A. W. (1983). Managerial work: The influence of hierarchical level and functional specialty. Academy of Management Journal, 26, 170-177.

Pearlman, K. (1980). Job families: A review and discussion of their implications for personnel selection. Psychological Bulletin, 87, 1-28.

Peres, S. H. (1962). Performance dimensions of supervisory positions. Personnel Psychology, 15, 405-410.

Prien, E. P. (1962). Assessments of higher-level personnel: V. An analysis of interviewers' predictions of job performance. Personnel Psychology, 15, 319-334.

Prien, E. P., & Liske, R. E. (1962). Assessments of higher-level personnel: III. Rating Criteria: A comparative analysis of supervisor ratings and incumbent self-ratings of job performance. Personnel Psychology, 15, 187-194.

Rohrer, Hibler, & Replogle, Inc. (1981). The managerial challenge: A psychological approach to the changing world of management. New York: Mentor (New American Library).

Rohrer, Hibler, & Replogle, Inc. (1965). Managers for tomorrow. New York: Mentor (New American Library).

Rommetveit, R. (1960). Selectivity, intuition, and halo effects in social perception. Oslo, Norway: Oslo University Press.

Rothstein, M., & Jackson D. N. (1980). Decision making in the employment interview: An experimental approach. Journal of Applied Psychology, 65, 271-283.

Rowe, P. M. (1963). Individual differences in assessment decisions. Journal of Applied Psychology, 47, 304-307.

Rundquist, E. A. (1947). Development of an interview for selection purposes. In G. A. Kelly (Ed.), New methods in applied psychology (pp. 85-95). College Park: University of Maryland Press.

Sackett, P., & Dreher, G. F. (1982). Constructs and assessment center dimensions: Some troubling empirical findings. Journal of Applied Psychology, 67, 401-410.

Sackett, P., & Wade, B. E. (1983). On the feasibility of criterion-related validity: The effects of range restriction assumptions on needed sample size. Journal of Applied Psychology, 68, 374-381.

SAS Institute Inc. (1982). SAS user's guide: Statistics, 1982 edition. Cary, NC: Author.

SAS Institute Inc. (1983). SUGI supplemental library user's guide. Cary, NC: Author.

Sarason, I. G., Smith, R. E., & Diener, E. (1975). Personality-research-components of variance attributable to person and situation. Journal of Personality and Social Psychology, 32, 199-204.

Sartain, A. Q., & Baker, A. W. (1978). The supervisor and the job (3d ed.). New York: McGraw-Hill.

Sawyer, J. (1966). Measurement and prediction: Clinical and statistical. Psychological Bulletin, 66, 178-200.

Schmidt, F. L., & Hunter, J. E. (1977). Development of a general solution to the problem of validity generalization. Journal of Applied Psychology, 62, 529-540.

Schmidt, F. L., & Hunter, J. E. (1980). The future of criterion-related validity. Personnel Psychology, 33, 41-60.

Schmidt, F. L., Hunter, J. E., Croll, P. R., & McKenzie, R. C. (1983). Estimation of employment test validities by expert judgment. Journal of Applied Psychology, 68, 590-601.

Schmidt, F. L., Hunter, J. E., & Urry, V. W. (1976). Statistical power in criterion-related validation studies. Journal of Applied Psychology, 61, 473-485.

Schmitt N. (1976). Social and situational determinants in interview decisions: Implications for the employment interview. Personnel Psychology, 29, 79-101.

Schneider, D. J. (1973). Implicit personality theory: A review. Psychological Bulletin, 79, 294-309.

Schneider, D. J., Hastorf, A. H., & Ellsworth, P. C. (1979). Person perception (2nd ed). Reading, MA: Addison-Wesley.

Schwab, D. P., & Heneman, H. G., III. (1969). Relationship between interview structure and interviewer reliability in an employment situation. Journal of Applied Psychology, 53, 214-217.

Schweder, R. A. (1982). Fact and artifact in trait perception: The systematic distortion hypothesis. Progress in Experimental Personality Research, 11, 65-100.

Siess, T. F., & Jackson, D. N. (1970). Vocational interest and personality: An empirical integration. Journal of Counseling Psychology, 17, 27-35.

Sines, L. K. (1959). The relative contribution of four kinds of data to accuracy in personality assessment. Journal of Consulting Psychology, 23, 483-492.

Slovic, P. (1969). Analysing the expert judge: A descriptive study of a stock-broker's decision process. Journal of Applied Psychology, 53, 255-263.

Slovic, P., Fischhoff, B., & Lichtenstein, S. (1977). Behavioral decision theory. Annual Review of Psychology, 28, 1-39.

Slovic, P., & Lichtenstein, S. (1971). Comparison of Bayesian and regression approaches to the study of human information processing in judgment. Organizational Behavior and Human Performance, 6, 649-744.

Sorbom, D., & Joreskog, K. G. (1976). COFAMM: Confirmatory factor analysis with model modification, a FORTRAN IV program. Chicago: National Education Resources.

SPSS Inc. (1983). SPSS^X user's guide. Chicago: Author.

Stern, G. G., Stein, M. I., & Bloom, B. S. (1956). Methods in personality assessment. Glencoe, IL: Free Press.

Stewart, D. W. (1981). The application and misapplication of factor analysis in marketing research. Journal of Marketing Research, 18 (February), 51-62.

Sundberg, N. D. (1977). Assessment of persons. Englewood Cliffs, NJ: Prentice-Hall.

Sydiaha, D. (1959). On the equivalence of clinical and statistical methods. Journal of Applied Psychology, 43, 359-401.

Sydiaha, D. (1961). Bales interaction process of personnel selection interviews. Journal of Applied Psychology, 45, 393-401.

Sydiaha, D. (1962). Interviewer consistency in the use of empathic models in personnel selection. Journal of Applied Psychology, 46, 344-349.

Tabachnick, B. G., & Fidell, L. S. (1983). Using multivariate statistics. New York: Harper & Row.

Tellegen, A., Kamp, J., & Watson, D. (1982). Recognizing individual differences in predictive structure. Psychological Review, 89, 95-105.

Tenopyr, M. L. & Oeltjen, P. D. (1982). Personnel selection and classification. Annual Review of Psychology, 33, 581-618.

Thornton, G. C., III., & Byham, W. C. (1982). Assessment centers and managerial performance. New York: Academic Press.

Tornow, W. W., & Pinto, P. R. (1976). The development of a managerial job taxonomy: A system for describing, classifying, and evaluating executive positions. Journal of Applied Psychology, 61, 410–418.

Trankell, A. (1959). The psychologist as an instrument of prediction. Journal of Applied Psychology, 43, 170–175.

Trattner, M. H., Fine, S. A., & Kubis, J. F. (1955). A comparison of worker requirment ratings made by reading job descriptions and by direct job observation. Personnel Psychology, 8, 183–194.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. Psychometrika, 38, 1–10.

Ulrich, L., & Trumbo, D. (1965). The selection interview since 1949. Psychological Bulletin, 63, 100–116.

van der Plas, L. P., & Bryant, F. B. (1985, October). Improving the usefulness of qualitative data: Using confidence ratings to assess the effects of deficient reporting on coder agreement. Paper presented at the joint meeting of the Canadian Evaluation Society, Evaluation Network, and Evaluation Research Society, Toronto, Canada.

Veroff, J., Feld, S., & Gurin, G. (1962). Dimensions of subjective adjustment. Journal of Abnormal and Social Psychology, 64, 192–205.

Wagner, R. (1949). The employment interview: A critical review. Personnel Psychology, 2, 17–46.

Webster, E. C. (1964). Decision making in the employment interview. Montreal: Industrial Relations Center, McGill University.

Wherry, R. J. (1959). Hierarchical factor solution without rotation. Psychometrika, 24, 45–51.

Wiener, Y., & Schneiderman, M. L. (1974). Use of job information as a criterion in employment decisions of interviewers. Journal of Applied Psychology, 59, 699–704.

Wiggins, J. S. (1973). Personality and prediction: Principles of personality assessment. Reading, Mass.: Addison-Wesley.

Wiggins, J. S. (1980). Circumplex models of interpersonal behavior. In L. Wheeler (Ed.), Review of Personality and Social Psychology: 1 (pp. 265–294). Beverly Hills, CA: Sage.

Wiggins, N., & Hoffman, P. J. (1968). Three models of clinical judgment. Journal of Applied Psychology, 73, 70–77.

Wright, O. R. (1969). Summary of research on the selection interview since 1964. _Personnel Psychology_, _22_, 391-413.

APPENDIX A

MANAGEMENT POSITION DESCRIPTION FACTORS

Product, Marketing, and Financial Strategy Planning. This factor
indicates long-range thinking and planning. The concerns of the
incumbent are broad and are oriented toward the future of the company.
They may include such areas as long-range business potential, ob-
jectives of the organization, solvency of the company, what business
activities the company should engage in, and the evaluation of new
ideas.

Coordination of Other Organizational Units & Personnel. The incumbent
coordinates the efforts of others over whom he/she exercises no direct
control, handles conflicts or disagreements when necessary, and works
in an environment where he/she must cut across existing organizational
boundaries.

Internal Business Control. The incumbent exercises business controls;
that is, reviews and controls the allocation of manpower and other
resources. Activities and concerns are in the areas of assignments of
supervisory responsibility, expense control, cost reduction, setting
performance goals, preparation and review of budgets, protection of the
company's monies and properties, and employee relations practices.

Products and Services Responsibility. Activities and concerns of the
incumbent in technical areas related to products, services, and their
marketability. Specifically included are the planning, scheduling, and
monitoring of products and services delivery along with keeping track
of their quality and costs. The incumbent is concerned with promises
of delivery that are difficult to meet, anticipates new or changed
demands for the products and services, and closely maintains the
progress of specific projects.

Public & Customer Relations. A general responsibility for the repu-
tation of the company's products and services. The incumbent is con-
cerned with promoting the company's products and services, the goodwill
of the company in the community, and general public relations. The
position involves first-hand contact with the customer, frequent
contact and negotiation with representatives from other organizations,
and understanding the needs of customers.

Advanced Consulting. The incumbent is asked to apply technical
expertise to special problems, issues, questions, or policies. The
incumbent should have an understanding of advanced principles, the-
ories, and concepts in more than one required field. He/she is often
asked to apply highly advanced techniques and methods to address issues
and questions which very few people in the company can do.

Autonomy of Action. The incumbent has a considerable amount of discretion in the handling of the job, engages in activities which are not closely supervised or controlled, and makes decisions which are often not subject to review. The incumbent may have to handle unique problems, know how to ask key questions even on subject matters with which he/she is not intimately familiar, engage in free-wheeling or unstructured thinking to deal with problems which are themselves abstract or unstructured.

Approval of Financial Commitments. The incumbent has the authority to approve large financial commitments and obligate the company. The incumbent may make final and, for the most part, irreversible decisions, negotiate with representatives from other organizations, and make many important decisions on almost a daily basis.

Staff Service. The incumbent renders various staff services to supervisors. Such activities can include fact-gathering, data acquisition and compilation, and record keeping.

Supervision. The incumbent plans, organizes, and controls the work of others. The activities are such that they require face-to-face contact with subordinates on almost a daily basis. The concerns covered by this factor revolve around getting work done efficiently through the effective utilization of people.

Complexity and Stress. The incumbent has to operate under pressure. This may include activities of handling information under time pressure to meet deadlines, frequently taking risks, and interfering with personal or family life.

Advanced Financial Responsibility. Activities and responsibilities concerned with the preservation of assets, making investment decisions and other large-scale financial decisions which affect the company's performance.

Broad Personnel Responsibility. The incumbent has broad responsibility for the management of human resources and the policies affecting it.

Source: Tornow and Pinto, 1976.

APPENDIX B

Sample Report

Jane Doe
Widget Company

1. Her general mental ability lies in the high-average range. She
    places situations in a fairly broad context in order to gain
    perspective and make sense of them. She can deal with both
    abstract issues and specific factors and details. She looks for
    those factors she believes are necessary to reach her goals.
    She is thoughtful and reasons in a logical manner.

2. She has a practical and realistic approach to solving problems.
    She analyzes a problem situation into component parts so she can
    track her progress in solving it. She is best with tangible
    tasks that yield observable results. She imposes her own
    structure in ambiguous situations as a guideling for her
    actions. She appears comfortable in fluid situations.

3. She is an emotionally stable person. She has an increasingly
    strong sense of who she is and appears comfortable with herself.
    She sees things pretty much as they are. She is aware of her
    emotions and expresses them openly and directly. She deals with
    tough situations directly and anticipates that she will be
    successful.

4. She is strongly motivated to achieve practical goals. She is
    fairly competitive and enjoys the challenge of meeting new
    situations. She has relatively low needs for security and
    moderate needs for affiliating with others. She can function
    comfortably on her own with minimal recognition and approval
    from others.

5. She is outgoing and personable in her dealings with others. She
    is easy to talk with and participates actively in conversation.
    She expresses her ideas clearly and definitively. She is open
    to input from others. She listens attentively and encourages
    others to express their views and opinions. She conveys a sense
    of inner confidence and strength without being overbearing or
    artificial.

6. She relates comfortably to various personal styles. She is at
    her best with those who are cooperative and direct. She is less
    effective with those who are less verbal and insecure. She
    develops close relationships on a selective bases. She prefers
    to remain relatively autonomous and self-directing.

7. She has an accurate but not deep understanding of her own personality. She recognizes her major characteristics. She is more aware of her strengths than her shortcomings. She is fairly curious about why she acts the way she does. She appears open to feedback on how she can improve herself.

8. She recognizes that others have motives and needs which differ from her own. She uses such information in adapting her way of relating to them. She reads others accurately. She is sensitive to some of the subtle aspects of dealing with others. She is likely to take others at face value unless she has a reason not to do so.

9. She is an adequately organized person. She plans her activities in some detail. She gives some thought to future implications of her actions. She can take on several tasks simultaneously without being overloaded. She is persistent in the face of setbacks. She can work both as an individual contributor and a team member.

10. Her style of supervising others is fairly direct and active. She is more of a teacher and coach than a boss. She helps others set goals and provides them with direct feedback on how they are doing. She takes a personal interest in those she supervises, yet maintains an appropriate amount of emotional distance.

Recommendation:

Jane Doe is recommended for the position of _____ insofar as her psychological characteristics are concerned.

Conclusions:

Jane Doe is a confident and thoughtful individual. Her strengths include her sense of autonomy and way of relating to others. She expects to be successful and conveys the same attitude to others. She is honest, direct and able to convince others of the value of something she believes in. She is able to take the good with the bad and tries to do her best.

In terms of her development she could benefit from practicing anticipating how new situations may differ from current ones and what she is likely to be faced with in those situations. She could then think of ways of responding that would increase the likelihood of her success in those situations. Such practice would supplement her more typical style of dealing with a situation as it unfolds.

APPENDIX C

APPENDIX C: I

MEMO TO: <u>All Office Managers</u>

FROM: <u>Corporate Headquarters</u>

RE: <u>Management Candidates Research Project</u>

The Operating Group has agreed to allow Loretta van der Plas, a Ph.D. candidate in Psychology at Loyola University of Chicago, access to PDG reports and PPT raw scores on candidates evaluated for management positions. The purpose of her study is to analyze the basis for hiring recommendations and to explore the relationship between recommendations and position characteristics.

Attached are materials which lay out it detail for administrative secretaries and psychologists how your office can go about carrying out the preliminary data collection procedures. There is a memo to your administrative secretary outlining how files are to be selected, prepared for forwarding to the researcher, and distributed to psychologists for their responses to a brief questionnaire. The material which secretaries will distribute to psychologists includes an introduction to the general purpose of the research and a glossary of operation definitions for completing the questionnaire.

We feel that this research will contribute to the knowledge of the field of psychology and benefit the firm in evolving its practice. Thank you for your cooperation. If you have any further questions, please feel free to contact Loretta van der Plas or _____ who will be working with Loretta on a day-to-day basis in the coordination of her research activities.

Enclosures

DATE: <u>July 12, 1984</u>

MEMO TO: <u>All Administrative Secretaries</u>
              <u>Loretta van der Plas & L. B.</u>
FROM: <u>Researcher in the Chicago Office</u>

RE: <u>Management Candidates Research Project</u>

Your cooperation and assistance is requested in selecting and preparing a sample of candidate reports for inclusion in a research study. A detailed set of procedures is presented here for making this material ready for research purposes.

<u>Please read through this entire set of procedures before taking any steps to prepare the material</u>.

1.   <u>Selection of reports</u>. Only candidate reports are to be included in the study. For each psychologist, including the manager, who has been on staff the last two years, please pull fifteen (15) files. Select cases which have been completed within the last 3-4 years. Include the Personal History Form and PPT raw score with the report.

   In selecting the <u>total</u> sample of candidate materials from your office (namely, evaluations conducted by all participating psychologists combined), please try to include a variety of positions and client companies, as well as a mixture of psychologist recommendations and candidate characteristics.

2.   <u>Assignment of code numbers to candidates</u>. Each packet of candidate material is to be assigned a code number consisting of two parts: a) a preassigned two-digit office code number; and b) a three-digit candidate code number.
   Your office code number is   and it will remain the same for each candidate from your office. However, all candidate files in your sample must be assigned a separate three-digit candidate code number, consecutively numbered from 001 to the total number of cases. For example, if you have four participating psychologists for whom you have selected 15 cases each, candidate code numbers will run from 001 to 060. Please attach a strip of 1" Post-it Cover-up Tape with the office and candidate code number on it to the upper right-hand corner of each page of each candidate report.

3.   <u>Master File of Research Cases</u>. You will find enclosed copies of a form entitled "Master File of Research Cases." Your preassigned office code number appears at the top left of this form At the far left of the form is a column with the heading "Candidate Code #." Subsequent pages of this form have been numbered from 001 to 100. Please record on this form the corresponding candidates's name, the date examined, and the candidate's raw PPT score.

4. <u>Xeroxing of Reports</u>. Each report is to be copied taking care to cover all indentifying data (namely, candidate's name, position and age as well as the name of the interviewing psychologist) while substituting the coded office and candidate numbers. Prior to xeroxing reports, please double check that a Post-it strip with coded numbers has been attached to each page of the report. You may also use 1" Post-it Cover-up Tape to then cover other identifying information. A copy of a report after identifying data has been removed is enclosed as an example of the intended product.

   After reports have been copied, please record a candidate's PPT raw score on the xeroxed copy. Next, you may remove all Post-it covers from the original report except those in the upper right-hand corner with coded numbers. These are to remain on the report until the psychologists have had an opportunity to complete a questionnaire regarding each candidate (see below).

5. <u>Coded xeroxed copies to be sent to researcher</u>. After the reports have been copied with coded number substitutions made, the coded copies are to be sent to Loretta van der Plas in care of the Chicago Office. Please try to mail these copies to Ms. van der Plas within one week of receiving this set of instructions.

6. <u>Questionnaires, instructions, and candidate files to be given to psychologists</u>. Enclosed are forms of a questionnaire to be completed by the interviewing psychologist for each candidate included in the research sample. Section I of the questionnaire has boxes designated to record the office and candidate code numbers of each case. Please fill in this information a attach the questionnaire to the top of its corresponding packet of candidate material (namely, reports with code numbers attached, Personal History Form, and PPT).

7. <u>Completion of the "Master File" of Research Cases</u>. Upon receipt of the completed questionnaires and corresponding case material, please record in the designated columns of the "Master File," the <u>number</u> of the response categories selected by psychologists. Please check to see that all questionnaires and case material have been returned to you and that the Master File is completely filled out. Once the Master File is complete, please make a copy to be sent to M   W   at the   Office. Please retain a copy for the Manager of your office.

8. <u>Forwarding of Completed Questionnaires</u>. After the responses to the items on the completed questionnaires have been recorded, please mail them to Loretta van der Plas at the Chicago Office.

9. <u>Return of Case Material to your Files</u>. The Post-it strips with coded numbers may now be removed from each page of the report and all material may be filed away.

If you have any questions regarding these procedures, please fell free to contact eith M   W   or Loretta van der Plas at the Chicago Office.

I wish to thank you in advance for your efforts in preparing these materials. Your cooperation is very greatly appreciated.

LvdP/mw
Enclosures

MASTER FILE OF RESEARCH SAMPLE

Office Code # _____ Office Location_____

| Candi-date Code | Candidate Name | Job Title | Company Name/Division | Interviewing Psychologist | Date Seen | PPT Raw Score | II. Demographic Characteristics | | | III. Job & Organizational Characteristics | | | |
							A. Age (yrs)	B. Sex M/F	C. Ethnic Group	A. Sup'v	B. Level	C. Func-tion	D. Phase

APPENDIX D

DATE: ___July 12, 1984___

TO: ___Participating Psychologists___

FROM: ___Loretta van der Plas & L. B.___

RE: ___Candidate PDG Questionnaire: Introduction and Instructions___

The Operating Group has agreed to support the dissertation research being conducted by Loretta van der Plas by providing her access to reports on management candidates. L. B. will be working with her in the Chicago office to coordinate research activities. The general aim of this research project is to statistically capture the evaluative framework and decision policies of an aggregate group of psychologists when making recommendations regarding candidates' suitability for varying categories of management positions. Both a pooled sample of cases and subgroupings formed on the basis of job and organization variables are to be examined for hiring recommendation relationships. The job variables include supervision, hierarchical level, and primary function.

Your cooperation is requested in completing a brief questionnaire for each of fifteen (15) reports that have been selected for inclusion in the research sample. Your administrative secretary has been requested to select these cases in as random a manner as is feasible. A separate Candidate Questionnaire has been provided for each file. Also, a separate set of definitions for use in completing the questionnaire is appended to this memo. An attempt has been made to arrive at definitions that may generalize across widely disparate jobs and organizations; however, categorization problems may remain. Your questions or comments are welcome and may be added to the back of the questionnaire or you may contact Loretta directly through the Chicago office.

You may note that Section I of the questionnaire has office and candidate code numbers filled in which correspond to numbers placed on the candidate report. To insure the confidentiality of candidates, clients and psychologists, coded numbers have been substituted for identifying data both on the xeroxed report being forwarded to the researcher and on the questionnaire.

Please try to return completed questionnaires and case material to your administrative secretary within two weeks. Note that the file that accompanies each questionnaire is the only office copy. Therefore, we trust you will keep the files in a secure place on the premises until you return them to your secretary.

A synopsis of research findings will be made available to your office. If requested, copies of the completed final report may also be provided.

Thank you in advance for your cooperation and assistance.

OPERATIONAL DEFINITIONS TO ACCOMPANY SECTION III
OF THE CANDIDATE QUESTIONNAIRES

A. Jobs involving and requiring supervisory responsibilities. Those
    in which the incumbent has administrative control (i.e., conducts
    performance appraisals and suggests salary increases and other
    administrative actions) over one or more subordinates engaged in
    work that directly contributes to meeting the supervisor's oper-
    ational objectives. Jobs which only have clerical support person-
    nel (e.g., a secretary or typist) reporting to them are not to be
    designated "supervisory" unless the job's objective is the admin-
    istration of clerical services (e.g., Office Services Supervisor).

B. Job's level in management hierarchy. This dimension refers to the
    vertical differentiation of management jobs across organization
    structures. Specific organizations may have either fewer (e.g.,
    two) or more levels than specified here. The generic descriptions
    of levels of management listed below have been adapted from
    Porter, Lawler, and Hackman's book, Behavior in Organizations
    (1975, New York: McGraw-Hill, pp. 90-91).

    1. Top management positions: Those concerned with overall goal
        formulation and policy decisions regarding allocation of
        resources.

    2. Middle management positions: Those concerned with subgoal
        formation and plans for implementing decisions from above and
        coordinating activities from below.

    3. Lower management positions: Those concerned with implementing
        decisions made at higher levels, and/or coordinating and
        directing the specific task activities of employees in rank-
        and-file positions at the lowest levels of the organization.

C. Job's primary function. This dimension attempts to differentiate
    jobs along a horizontal plane within organizations. It is fre-
    quently referred to as the "division of labor." The categories
    listed below are broad and may not easily generalize across organ-
    izations. The intent, however, is to categorize jobs in terms of
    the primary purpose each seeks to fulfill, while also taking some
    account of the process used to accomplish objectives. Therefore,
    jobs are not to be categorized merely on the basis of the depart-
    ment to which they report, nor on the basis of the technical skill
    prerequisites of an incumbent, but rather on the basis of the
    specific activities and main objectives required by the job.

    1. Marketing/Sales. Jobs primarily concerned with the selling,
        marketing or promotion of an organization's products or
        services, (Included are such diverse jobs as commercial loan
        officer, advertising copywriter, stockbroker, sales engineer,
        district sales manager, and marketing vice president).

2. Personnel/Human Resources & Development (HRD). Jobs primarily concerned with the management of an organization's human resources. (Included are such jobs as personnel researcher, sales trainer, nurse, industrial relations specialist, employment manager, vice president of HRD.)

3. Legal. Jobs primarily concerned with the formulation, arbitration, interpretation, or compliance and litigation of the law. (Included within this category are such jobs as lawyer, senior attorney, chief corporate counsel.)

4. Finance/Accounting/Management Information Systems. Jobs primarily concerned with the handling of monetary affairs or the processing of records, accounts, or correspondence. (Included are such jobs as auditor, MIS specialist, senior accountant, financial analyst, comptroller, treasurer, vice pres. finance.

5. Engineering/Research & Development. Jobs primarily concerned with the application of technological or scientific theory and/or skills to the design or development of products or procedures. (Included are such jobs as mechanical engineer, systems engineer, architect, biochemist, director of R & D.

6. Production/Manufacturing/Operations. This includes a variety of jobs focused on activities relevant to the operating core of diverse organizations. Jobs concerned with the fabrication goods or articles, the extraction, procurement, or processing of raw materials, the construction of buildings or other non-mass-produced units, the installation, maintenance, or repair of equipment, property, or facilities, and the movement of persons or goods from one location to another (e.g., foreman, traffic manager, purchasing agent, superintendent, pilot, operations manager, plant manager, and V.P., manufacturing).

7. General Administration. These are typically staff positions primarily concerned with the task of coordinating, linking, and integrating diverse units or functions (e.g., field liaison manager, marketing services administrator, administrative vice president.

8. General Management. Included are jobs that have responsibility for a multitude of functions, some of which may be quite diverse. These are typically higher level line management jobs with accountability for results (e.g., group vice president, division head, chief executive officer.

9. Other. Include here the job title and a brief description of the primary responsibilities of any job that you cannot easily place using the above categories.

CANDIDATE   QUESTIONNAIRE

(To be completed by Interviewing Psychologist)

****

SECTION I: IDENTIFYING CODES

Office Code # /__/__/   Candidate Code # /__/__/__/

****

SECTION II: DEMOGRAPHIC DATA

A. Candidate's Age at time of interview: /____/

B. Candidate's Sex: /____/ 1. Male   /____/ 2. Female

C. Candidate's Racial or Ethnic Group Membership:

/____/ 1. White (Caucasian)

/____/ 2. Black (Negro; Afro-American)

/____/ 3. Oriental (Chinese, Japanese, Southeast Asia, Indian from India)

/____/ 4. Hispanic (Puerto Rican, Mexican or Spanish American, South American,
                        Spanish, Cuban)

/____/ 5. American Indian

/____/ 6. Other (Please specify_____)

/____/ 7. Not known

****

SECTION III: JOB & ORGANIZATION CATEGORIES (See accompanying definitions)

A. Is this a Supervisory job?

/____/ 1. Yes   /____/ 2. No   /____/ 3. Do not know

B. Job's Level in a management hierarchy: (Check one box)

/____/ 1. Top

/____/ 2. Middle

/____/ 3. Lower

C. Job's primary Functional responsibility: (Check one box only)

/____/ 1. Marketing/Sales

/____/ 2. Personnel/Human Resources & Development

/____/ 3. Legal

/____/ 4. Finance/Accounting/Management Information Systems

/____/ 5. Engineering/Research & Development

/____/ 6. Production/Manufacturing/Operations

/____/ 7. General Administration

/____/ 8. General Management

/____/ 9. Other (please explain)_____
          _____

D. Which of the five evolutionary Stages described by RHR in The Managerial
    Challenge (1981) best characterized the client organization at the time
    this candidate was interviewed? (Check one box only)

/____/ 1. Entrepreneurial

/____/ 2. Personal

/____/ 3. Professional

/____/ 4. Bureaucratic

/____/ 5. Matrix

/____/ 6. Other (please explain)_____
          _____

****

SECTION IV: COMMENTS

Please add any explanatory remarks or comments that you may have regarding
the above items to the back of this questionnaire.

APPENDIX E

CODING INSTRUCTIONS

General Instructions to Coders

The following set of psychological traits are to be rated on a forced choice basis from an interpretive reading of reports. While in many cases there will be direct correspondence between a statement in the report and one of the levels of a variable in the rating format, in many other cases a candidate's standing on a variable will have to be deduced from a number of statements contained in the report. Be aware that a simple or ambiguous statement within the body of the report may often be spelled out more clearly in the conclusions of the report. The forced choice format will require the rating of variables with varying levels of confidence. Therefore, confidence ratings will also be required for each of the variables in columns 12-66. Please refer to the instructions below for coding the confidence ratings.

Instructions for Coding Trait Ratings

Each trait (excepting general mental ability which has 7 levels) has been defined and anchored at five (5) levels. The five levels of each variable have been set up to generally represent the following:

1 = Candidate either lacks the trait, is very or extremely low on the trait, or is described as being high on another characteristic which is antithetical to the variable in question.

2 = Candidate has a limited or modest amount of the trait, or has the trait plus displaying some tendency or infrequent or low occurence of an opposite trait.

3 = Candidate is described as having a moderate, average, or normal amount of the trait. Include here traits qualified by the term relatively.

4 = Candidate is described as possessing the trait without such qualifiers as a high, moderate, or low level of the trait being used. However, include here the traits qualified by terms such as usually, generally, typically, etc.

5 = Candidate is described as having a very high level of the trait by use of such qualifiers as very, extremely, exceptionally, quite, to a high degree, considerably, etc.

Trait definitions and sample responses for each level are provided below. Please read these carefully and refer to them as often as necessary when coding reports.

Instructions for Coding Confidence Ratings

      Each psychological trait rating made in columns 12 through 66 of the first coding form for a case must also be coded for the level of the coder's confidence in making the trait rating. The confidence ratings are to be recorded in the corresponding columns 12 through 66 of the second coding form for each case.

      Use the following anchors as a guide to record the level of confidence with which each trait rating was made.

      1 = Guess/extremely low confidence. From information contained in the report, it is extremely difficult to draw an inference regarding a candidate's standing on this trait. A way to assign this rating is to try to imagine that a candidate is alternately high or low on a trait. If either extreme is possible, low confidence exists.

      2 = Moderate confidence. Although the candidate's standing on this trait is not specifically referred to in the report, it is possible to draw an inference regarding the trait's probable level based on other information in the report. If a given trait rating is more likely to be true than not true, then moderate confidence exists.

      3 = High confidence. The candidate's standing relative to this trait was explicitly referred to in the report and an inference regarding the level of the trait could be made with considerable confidence.

Coding Sequence

As each psychological report is read, sentence by sentence, coders should endeavor to score any of the relevant trait variables from the set of 55 traits. A frame for holding the answer sheets has been designed with brief trait names adjoining the corresponding columns for recording ratings. Although traits have been ordered in terms of their probable appearance in reports, the frame is provided in order to ease the task of skipping around to record a trait rating as the trait is mentioned in the report. This need to skip around requires that coders have considerable familiarity with the trait definitions as well as the trait names. The codebook containing anchors for the levels of each trait should be referred to as often as necessary in order to determine the appropriate ratings. As the coder reads further into the report, particularly as the Conclusions are read, ratings made earlier may need to be changed as the appropriate level of the trait becomes clearer.

As the coder finishes the first reading of the report, typically 50% to 80% of the traits will have been rated under conditions of high confidence. At this point, coders should line up each row of columns on the second coding form to the left of its respective row of trait ratings and record a #3 confidence rating in the column corresponding to the columns of trait ratings made thus far.

After the #3 confidence codes have been recorded for those traits rated from an initial reading of the report, coders should next examine the first coding form for blank columns (12-66) and determine a rating for all remaining traits. At the same time, coders must decide whether a trait rating is based on a logical inference (moderate confidence) or is a guess (low confidence) and mark the confidence level in the corresponding column of the second coding form. Most of the ratings made in this second pass through the traits will likely be based on moderately confident inferences (2); however, a few may still be made with high confidence (3) and others with low confidence (1).

Checking the Coding Form for Completeness

Before moving on to the next report, coders should check both the first and second coding forms to insure that ratings have been assigned to each of the designated columns.

CODING SCHEME FOR PSYCHOLOGICAL TRAITS

Column Description

12 GENERAL MENTAL ABILITY: Level of ability described in the first or second sentence of the psychological report; also referred to as intellectural ability, problem-solving ability or skills, or as mental ability.

Codes: (Note: If a range encompassing 2 levels is specified, code the lower.)

1 = Below average
2 = Low average
3 = Average
4 = High average/above average/well above average
5 = Low superior; lower portion of the superior range
6 = Superior
7 = Very superior, high superior

Column Description

13 ANALYTIC REASONING ABILITY/INCISIVE THINKING: Effectiveness in the ability to reduce complex issues or problems into separate, distinguishable, and essential elements or components; also, ability to "see into" issues and problems, to get to the heart of the essence of things or to grasp the basic thrust of something; ability to define problems; ability to sort out complex issues.

Codes:

1 = Poor analytic ability; takes things at face value; not analytical; has considerable difficulty handling complexity (with lack of ability implied)
2 = Modestly developed analytic ability
3 = Moderate analytic skills
4 = Good analytic ability; an effective analyzer; is analytical, thinks in depth; rarely slips into looseness or superficiality; penetrating; moves quickly to the core of issues; generally analytic, probing mind
5 = Very good, extremely well developed, superior analytic ability, quite analytical, capable of making fine discriminations in the analysis of situations or problems
9 = Left it blank

Column Description

  14 DATA GATHERING SKILLS: Includes the tendency to gather relevant data in a manner that is thorough, systematic, objective, and accurate prior to making decisions or solving problems.

Codes:

    1 = Very poor; doesn't obtain facts; jumps before looking; may be careless about accuracy, lacking in objectivity

    2 = Somewhat poor; may not always get sufficient information or input from others; at times too quick to act or jump to conclusions before obtaining relevant data

    3 = Moderate skills

    4 = Good; a fact gatherer; usually tries to obtain relevant information; generally thorough and systematic

    5 = Excellent data gathering skills; very good at obtaining input from others; very methodical

    9 = Left it blank

Column Description

  15 DELIBERATION SKILLS: The ability to apply the intellectual process and deliberate prior to action; also, the ability to deliberate in a logical and rational manner when synthesizing data orn deriving inductive or deductive inferences and conclusions.

Codes:

    1 = Very poor; is illogical; fails to deliberate before acting; fails to reflect before acting

    2 = Poor or somewhat poor; his thinking tends to follow his own predilections and structure rather than to be responsive to the situation facing him; low average; insufficiently reflective

    3 = Moderate or average in the ability to reason and solve problems or to engage in deliberation prior to drawing conclusions

    4 = Effective in generating and thinking through a variety of alternative solutions or courses of action; conclusions are solidly based; thinks logically; good facility in organizing disparate ideas and data into cohesive units

    5 = Very good or excellent; highly logical; display highly effective use of reasoning and problem solving skills

    9 = Left it blank

----

16 PRACTICAL JUDGMENT: Common sense; practicality, pragmatism; ability to reach practical, realistic, or appropriate conclusions from available information

<u>Codes</u>:

    1 = A dreamer; sacrifices practicality; very poor judgment; lacks common sense
    2 = At times loses sight of what is practical; judgment is somewhat poor
    3 = Levelheaded and pragmatic; has a practical orientation; good judgment
    5 = Excellent practically oriented skills; excellent judgment or common sense; very levelheaded
    9 = Left it blank

<u>Column Description</u>

17 DETAIL ORIENTATION: Tendency to be empirical, technical, mechanical, or numerical and to think concretely, to focus on details and specific measurable and/or tangible objects, factors or actions; data or things oriented

<u>Codes</u>:

    1 = Very poor, overlooks or neglects specifics or details either through carelessness, inability, disinterest, or conflicting interests
    2 = Tendency toward #1 or #1 softened
    3 = Moderately able to average in ability to deal with details, specifics, or concrete items
    4 = Concrete, empirical; likes to deal with observable and verifiable data
    5 = Very oriented towards specifics (actions, data, things)
    9 = Left it blank

Column Description

   18 ABSTRACT/CONCEPTUAL THINKING: Ability to derive general
principles or generalize from specifics; ability to grasp intangi-
bles; sense of intangibles; ability to think on a <u>conceptual</u> and
theoretical level; comprehensiveness and
broadness of scope

Codes:

      1 = Is not an abstract or theoretical thinker; has diffi-
culty conceptualizing on a broader basis; poor grasp
of intangibles
      2 = Not fully comprehensive in thinking; modest ability to
think abstractly
      3 = Moderate, average, basically sound
      4 = Enjoys broad-gauge conceptualizing; capable of having
an overview of a situation and looking at things from
a systems point of view; capable of abstract thinking
      5 = Thoroughly conceptual thinker; excellent conceptual
skills
      9 = Left it blank

Column Description

   19 CREATIVITY/INNOVATIVENESS: Ability to generate fresh and
imaginative approaches; flexible thinking; ability to
not get stuck in one approach or perspective

Codes:

      1 = Lacks creativity and/or imagination; bound by prior
experience
      2 = Somewhat unimaginative; tends to rely on prior ex-
perience; is somewhat inflexible; skill in original
thinking is limited
      3 = Moderately creative; not fully imaginative; under
certain specified conditions able to be innovative
      4 = Has a creative or imaginative mind; innovative
      5 = Very creative/imaginative thinker; has considerable
ability to generate new ideas or approaches; prefers
to be an idea man
      9 = Left it blank

Column Description

20 INTUITION: The ability to know or judge something without any or with very little conscious process of cogitation or reflective reasoning. Also, the ability to unconsciously interpret faintly conscious stimuli based on finely sharpened perception.

Codes:

1 = Lacks intuitive ability; judgments are bound by hard or clearly observable factors or what can be cleary arrived at through a rational reasoning process
2 = Not too intuitive or seldom intuitive; empirically based
3 = Moderately intuitive; sometimes makes decisions on the basis of intuition
4 = Intuitive; frequently operates intuitively; gets effective assistance from intuitive hunches; pays attention to his intuitive feelings when deciding
5 = Very intuitive; is predominately intuitive; has a very keen intuitive sense
9 = Left it blank

Column Description

21 LONG RANGE THINKING/FARSIGHTEDNESS: Ability to think strategic-ally in terms of distant goals or objectives and to envision future possibilities and consequences.

Codes:

1 = Quite short term; needs to see immediate relevance; difficulty thinking through problems involving sequen-tial steps over an extended period of time; fails to see the long view; shortsighted
2 = Near to mid-term planning best; same as #1 but not as strong
3 = Mid-term, moderate, average, adequate
4 = Thinking solid over longer terms; generally tries to keep the long view in sight
5 = Enjoys broad-gauge planning; very long range thinking; typically keeps the long view in sight; a strong long-range planner; a strong desire to seek new future opportunities
9 = Left it blank

Column Description

22 CURIOSITY/INQUISITIVENESS: Interest in learning, interest in a wide range of topics.

Codes:

1 = Extremely narrow focus of interests, circumspect
2 = Limited curiosity, somewhat lacking in curiosity or inquisitiveness
3 = Moderately curios
4 = Is mentally proactive and inquisitive; is curious and a quick learner
5 = Very broad range of interests; high level of curiosity; an active and eager learner; very inquisitive
9 = Left it blank

Column Description

23 INTELLECTUAL FOCUS AND MENTAL DISCIPLINE: Ability to stick to the point; think concisely, precisely.

Codes:

1 = Thinking is often tangential; has considerable difficulty sticking to the point; mental processes are losse and unfocused
2 = Same as #1 "at times," "to some degree," etc.
3 = Moderate, average or adequate
4 = Is generally disciplined mentally; usually sticks to the point; has an element of precision in his thinking
5 = Thinks in a highly or very structured, concise, focused, or disciplined manner
9 = Left it blank

Column Description

24 MENTAL AGILITY OR QUICKNESS: Ability to think on one's feet, alertness.

Codes:

1 = Plodding, perhaps even dronelike in the use of intellectual ability
2 = Slow-paced thinker
3 = Typically alert, or quick except or when....(gives exception); moderately agile or alert
4 = Alert, mentally agile; quick on her feet; is mentally alert and responsive
5 = Very agile mentally; quick thinker; thinking is quite rapid; very alert mind; thinks rapidly
9 = Left it blank

Column Description

25 VERBAL SKILLS: Verbal presentation and expression, ability to articulate and effectively convey ideas.

(Note: If the report indicates a balance between verbal and numerical skills, and no other information, use intelligence level to code verbal ability. 1 = low average, 2 = average, 3 = high average, 4 = low superior, 5 = superior or above.)

Codes:

1 = Poorly developed, seriously or very limited
2 = Modestly well developed; overly concise; communicates only when of personal value rather than to improve understanding
3 = Moderately well developed; verbal communication skills are average or adequate
4 = Expresses ideas clearly; good verbal skills; well developed verbal skills; can explain ideas to others
5 = Very articulate; very or extremely well developed verbal communication skills
9 = Left it blank

Column Description

26 RESULTS ORIENTATION: Action orientation; focuses on moving toward outcomes rather than dwelling on process; goal orientation.

Codes:

    1 = Overly analytical to the neglect of action; stuck in an ivory tower; procrastinator
    2 = More process than product oriented; a thinker more than a doer
    3 = Moderately action oriented; also, balances thought and action without undue emphasis on either
    4 = Goal oriented; focuses on results; a doer
    5 = Sets mind to something and goes after it; very or extremely #4
    9 = Left it blank

Column Description

27 GENERAL LEVEL OF ADJUSTMENT OR MATURITY: Freedom from disabling emotional hang-ups or anxiety; ego strength or "inner" strength; ability to see things realistically and to deal with things on an adult basis.

Codes:

    1 = Specifies some seriously limiting factor; immature
    2 = Specifies some mildly limiting factor (e.g., tension, worry, impulsivity, etc.)
    3 = Normal range; is reasonably or moderately well adjusted or mature
    4 = Is mature, is well adjusted
    5 = Is quite, or very, mature; is very well adjusted
    9 = Left it blank

Column Description

28 EMOTIONAL STABILITY: Consistency, emotional predictability.

Codes:

    1 = Quite, very, seriously unstable; unpredictably emotional;
        emotionally labile; very moody
    2 = Somewhat unstable or describes some instability in
        specific circumstances (e.g., tendency to lose temper
        when....)
    3 = Moderately consistent, stable, etc.
    4 = Stable and consistent; steady, levelheaded, on an
        even keel emotionally
    5 = Very steady; extremely levelheaded
    9 = Left it blank

Column Description

29 ADAPTABILITY TO CHANGE: Behavioral flexibility with respect
to situational and environmental change; ability to change
one's behavior, course of action, strategies, and/or goals as
changing conditions warrant it.

Codes:

    1 = Rigid; inflexible; doesn't change as situations warrant
    2 = Approaches new situations cautiously; a stable environ-
        ment is important
    3 = Moderately adaptable
    4 = Can adapt to change; is flexible in the light of new
        information
    5 = Sizes up situations quickly; reads subtle cues; is
        adaptable and able to tailor responses to situational
        demands
    9 = Left it blank

Column Description

30 DECISIVENESS: Decision making ability; ability to come to a timely conclusion and select an alternative with resolve.

Codes:

1 = Very poor; obsessive or ruminative; indecisive; lacks resolve; easily swayed; procrastinates about making decisions
2 = Less than adequate; a hesitant or cautious decision maker
3 = Moderately decisive
4 = Decisive; able to make decisions
5 = Very decisive; comes to firm and timely conclusions; a confident decision maker
9 = Left it blank

Column Description

31 RISK TAKING ORIENTATION: Willingness and/or tendency to be venturesome and to take risks. (Also, lack of a need for security.)

Codes:

1 = Poor or low risk taker; high need for security, certainty, and/or predictability
2 = Cautious, avoids risk when possible; somewhat low in risk taking ability
3 = Moderate risk taker
4 = Able to take calculated risks; able to meet new challenges
5 = High risk taker, venturesome, enjoys trying untested ground; seeks out new challenges
9 = Left it blank

Column Description

32 TOLERANCE FOR AMBIGUITY AND COMPLEXITY: Capacity to cope with
issues, problems, or situations characterized by a lack of
clarity, definitiveness, certainty, or structure or which are
complex, filled with intricacies or are dilemma-ridden.

Codes:

1 = Very low tolerance; needs or is best able to cope
with problems or situations which are clear-cut,
straightforward, or structured
2 = Somewhat low tolerance; preference or tendency toward
#1
3 = Moderate tolerance or capacity to cope
4 = Can tolerate ambiguity and complexity; copes relatively
well
5 = High tolerance; finds challenge in or thrives on
situations or problems that are ambiguous, knotty, or
dilemma-ridden
9 = Left it blank

Column Description

33 TOLERANCE FOR STRESS (S), PRESSURE (P) OR FRUSTRATION (F):
Ability to function in a self-controlled, purposeful and effective
manner despite, S, P, or F.

Codes:

1 = Has considerable difficulty handling stress, pressure,
or frustration; very low tolerance
2 = Has difficulty handling S, P, or F; low or somewhat
low tolerance
3 = Moderate ability to handle S, P, or F
4 = Can handle, can rise to the occasion in the face of
S, P, or F; resilient; handles stress well
5 = Thrives on it; functions best when challenged (by
S, P, or F); handles stress very well
9 = Left it blank

Column Description

34 EMOTIONAL EXPRESSIVENESS: Appropriate liveliness, spon-
taneity, dynamism of expression; in touch with a range of
emotions and able to appropriately express them.

Codes:

1 = Very reserved, extremely controlled, lacking in spon-
taneity, bottled up; may appear overly flat and
unresponsive
2 = Controlled and reserved; restrained; tends to suppress
his emotions, holding in his feelings and rarely
showing impatience or temper
3 = Average, adequate; calm, relaxed, and somewhat low
keyed; neither particularly constrained nor expressive
4 = Warm, expressive, spontaneous
5 = Quite, very, or extremely #4; lively and animated
9 = Left it blank

Column Description

35 OPTIMISM: Ability to adopt a realistically positive outlook
on life.

Codes:

1 = Tends to be very pessimistic; a worrier
2 = Tends to look on the bleak side; is somewhat pessi-
mistic or lacking in optimism
3 = Moderately or fairly optimistic
4 = Positive; optimistic; generally expects things to
work out
5 = Is very, quite, or highly optimistic; very positive
9 = Left it blank

Column Description

36 ENERGY AND DRIVE: The vitality and capacity to put forth
a vigorous and sustained effort to accomplish one's
objectives.

Codes:

1 = Extremely low energy or low drive; phlegmatic,
sluggish, lethargic, or apathetic
2 = Somewhat low in energy or drive
3 = Moderate energy or drive
4 = Energetic; relatively high energy level (e.g.,
brings intensity to her work)
5 = High or exceptional level of energy or drive
9 = Left it blank

Column Description

37 PERSEVERANCE: Ability to pursue a task/goal/objective in a
self-disciplined fashion despite opposition and/or tedium;
strength or patience in dealing with something arduous.

Codes:

1 = Lacks perseverance or ability to persist; lacks self-
discipline to persist; very low endurance
2 = Low in perseverance; tendency toward #1
3 = Moderate ability to persevere; basically steady and hard
working
4 = Is persevering, self-disciplined, and persistent
5 = Is extremely or exceptionally persevering; very high
ability to persist despite obstacles; tenacious
(used positively)
9 = Left it blank

Column Description

  38 INITIATIVE: Ability to be self-directed and self-starting; lack of a need for direction; self-motivating. The ability to be enterprising and to originate projects or actions.

Codes:

    1 = Very low or very poor in initiative; requires con-
        siderable prompting; needs close supervision or close
        direction; needs considerable direction
    2 = Somewhat lacking in initiative
    3 = Moderately self-directed
    4 = Has initiative; is a self-starter; is self-directing
    5 = High level of initiative; needs no prompting
    9 = Left it blank

Column Description

  39 INDEPENDENCE/SELF-RELIANCE: Ability to function on the basis of one's own beliefs, judgments or interpretations despite opposition, lack of approval, conflicting expectations or constraints.

Codes:

    1 = High need for approval; very dependent on others for
        acceptance; caves in under opposition
    2 = Somewhat dependent on others; tendencies toward #1
    3 = Moderately independent; not overly dependent on
        approval
    4 = Is independent; does not depend heavily on the approval
        of others
    5 = Little or no need for others; primarily an individual
        contributor; very independent
    9 = Left it blank

Column Description

40 NEED FOR AUTONOMY: Desire to function freely and without con-
straints; need to be self-governing; preference for low structure;
desire to work without close supervision.

Codes:

1 = Very low need for autonomy; needs to be in a structured
setting with clear guidelines; a true conformist
2 = Low need for autonomy; prefers some structure and
guidelines
3 = Moderate need for autonomy; or, balanced between
ability to function both with and without structure
4 = Needs and prefers to function autonomously but can
still be a team player when necessary
5 = High need for autonomy; strong desire to be free of
restraints and to function autonomously; need for
autonomy to the point of nonconformity
9 = Left it blank

Column Description

41 NEED FOR ADVANCEMENT: Career motivation and ambition; need for
achievement in terms of status, success, money, etc.

Codes:

1 = Not ambitious, lacks career motivation or need to advance
2 = Interested but fuzzy about specifics, i.e., where heading or
how to get there; vaguely ambitious, modest in ambition
3 = Moderately ambitious; realistic; general but realistic
ambition
4 = Looking to build a future for himself in management;
ambitious
5 = Very ambitious; strong need to advance
9 = Left it blank

Column Description

42 NEED FOR POWER: Desire to be dominant with respect to others; need to be in control; authoritarianism

Codes:

1 = Is a follower; avoids being in control; is very uncomfortable when placed in a power situation; is very submissive
2 = Somewhat or a tendency towards #1
3 = Moderate need for power; can take charge as necessary, although is also comfortable in a follower role
4 = Somewhat dominant; desires to be in charge; seeks opportunities to be in charge
5 = Has a high need for power, dominance, or to be in control of others
9 = Left it blank

Column Description

43 GENERAL INTERPERSONAL SKILLS: Overall human relations skills: The overall ability to relate to others in a manner that is effective and allows for recprocal give-and-take as well as respect.

Codes:

1 = Poor
2 = Limited, modest
3 = Average level; moderately developed
4 = Good, maintains smooth, harmonious relationships
5 = Excellent
9 = Left it blank

Column Description

44 SOCIAL SKILLS OR FACILITY: Social adeptness and ease; person-
   ableness; skill at impression management; ability to engage in
   small talk, say the appropriate thing, etc.; ease in exercising or
   expressing social amenities.

Codes:

   1 = Personal contact skills are weak; is uncomfortable in new
       situations; self-conscious
   2 = Initially a bit stiff in social situations; somewhat
       uncomfortable at first
   3 = Moderately personalbe, able to relate when necessary
   4 = Diplomatic, tactful, comfortable in a variety of social
       situations; poised; has a warm and easy style, personable
   5 = Establishes rapport easily, quickly, quite comfortably;
       quite skilled socially; able to put others at ease;
       makes a strong first impression on others; very personable
   9 = Left it blank

Column Description

45 AFFILIATIVENESS/SOCIABILITY: Affiliative inclinations; friend-
   liness; gregariousness

Codes:

   1 = Quite aloof, impersonal, distant or inappropriately
       alienating; superficial, not genuine, a loner
   2 = Somewhat cool or aloof, strictly business; not
       socially gregarious or naturally outgoing except
       when with familiar people; can take or leave people
   3 = Not highly social, but gets along; moderately
       friendly
   4 = Generally friendsly and sociable towards others;
       spends energy developing and maintaining relationships
   5 = Very outgoing, gregarious, extremely sociable; interpersonal
       relationships are very important; strong need to affiliate
       with others
   9 = Left it blank

Column Description

46 ASSERTIVENESS: Non-aggressive (i.e., non-hostile and non-destructive) directness; also, ability to manage conflict.

Codes:

1 = Withdrawing or hostile; passive aggressive; aggressive in a destructive rather than assertive sense
2 = Strives to keep things congenial despite costs; has difficulty relating to outspoken dominant, or self-aggrandizing individuals; slow to criticize or confront; rarely outspoken; relatively unassertive
3 = Some tendency to avoid direct conflict or confrontation; moderately assertive
4 = Defends views when challenged; can responsibly assert himself with authority figures; forthright
5 = Very direct and forthright while not being hostile or insensitive to others; very skilled in handling conflict or difficult individuals; able to handle vigorous give-and-take exchanges with openness and without hurt feelings
9 = Left it blank

Column Description

47 PERSUASIVENESS/INFLUENCE: The ability to positively impact others; the ability to influence and win over others by reasoning, inducement, or through the establishment of credibility.

Codes:

1 = Lacks persuasive skills (may be either under or overbearing)
2 = Limited in ability to persuade others
3 = Moderately persuasive; good in some respects and deficient in others
4 = Is persuasive; enjoys presenting ideas to others; impacts others in a manner that earns attention and respect
5 = Gets others involved in and excited about new ideas; is highly persuasive; can easily influence others; has a charismatic ability to draw others to his or her point of view
9 = Left it blank

Column Description

  48 INSIGHT INTO OTHERS: The capacity to responsibly discern
     the true nature and deeper motivations of others.

Codes:

     1 = Uncritically accepts that other people are like oneself;
         measures others in terms of own beliefs and interests; quite
         shallow
     2 = Has a spotty or superficial understanding of the motives of
         others (e.g., tends to be overly trusting); understands that
         people differ but doesn't have a deep understanding of why;
         usually takes others at face value; limited insights;
         moderate insight into others
     3 = Has built up a fairly good or quite adequate understanding
         of others based on incidents or samples of behavior;
         however, this understanding is limited and doesn't go very
         deep.
     4 = Intuitively skillful and consistently oriented towards
         trying to understand the feelings, attitudes, and motives of
         others, although this knowledge may primarily be used to
         one's own advantage
     5 = Able to both understand and conceptualize the deeper
         feelings, attitudes, and/or motives of others and is
         able to use this understanding to motivate others
         toward self-improvement.
     9 = Left it blank

Column Description

  49 INTERPERSONAL FLEXIBILITY: Ability to relate differentially to
     different people and to tolerate differences in others.

Codes:

     1 = Cannot adapt to others
     2 = Intolerant or impatient towards others who hold dissimilar
         values
     3 = Adequate or moderate; some difficulty, but generally able
     4 = Able to adapt actions to deal with various personality
         styles
     5 = Very adept at modifying behavior so as to establish
         rapport with a broad range of people in different
         situations
     9 = Left it blank

<u>Column</u> <u>Description</u>

50 LISTENING AND RESPONDING SKILLS: Ability to attend to others in a receptive, thoughtful, discriminating, and responsive manner.

<u>Codes</u>:

1 = Guarded, cautious, doesn't listen; is unapproachable; lacks empathy for others
2 = Has some difficulty listening or attending to others
3 = Moderately attentive; average listening skills
4 = Listens well; shows concern for others' views; is responsive to others; listens attentively; is easy to talk to
5 = Is able to respond to others with a high level of interpretive or inferential understanding, i.e., is an active listener; can respond with empathy
9 = Left it blank

<u>Column</u> <u>Description</u>

51 RESPECT FOR OTHERS/SENSITIVITY TO OTHERS: Has an attitude of respect, consideration and care for the rights, needs, and feelings of others.

<u>Codes</u>:

1 = Very unconcerned or insensitive; does not respect others
2 = Somewhat insensitive to others or somewhat inconsiderate
3 = Moderately sensitive to others' feelings
4 = Is considerate; is sensitive to the feelings of others; respects others
5 = Very concerned, considerate, or caring; is extremely sensitive to the feelings of others; has considerable respect for others
9 = Left it blank

Column Description

52 INSIGHT INTO SELF: PERSONAL INSIGHT: The capacity to responsibly
discern the true nature (strengths and weaknesses) and deeper
motivations of oneself.

Codes:

1 = Lacks understanding of the impact he/she makes on others;
    cannot identify own strengths and weaknesses accurately
    and objectively, nor is interested in doing so
2 = Superficially recognizes own strengths and weaknesses;
    understanding is spotty; may only be able to recognize
    high points and tend to overrate his/her ability;
3 = Rather accurate and complete understanding of strengths
    and weaknesses, but doesn't know how or doesn't choose to
    use this awareness as a means to self-development; moderate
    self-insight
4 = Skillful in analyzing both strengths and weaknesses
    accurately and objectively with ability to use information
    in a program of self-development
5 = Very high level of insight into self and uses it very
    constructively
9 = Left it blank

Column Description

53 SELF-CONFIDENCE: SELF-ESTEEM, EGO: Consciousness and trust in
one's own powers, abilities, worth, and self-sufficiency.

Codes:

1 = Insecure, lacks self-confidence
2 = Low in self-confidence; lacks true self-confidence,
    although relatively good at bluffing through; can
    appear self-confident on the surface, though unsure
    of self
3 = Moderately confident
4 = Is confident of self
5 = Strong belief in self; high level of comfort with self;
    highly self-confident or secure
9 = Left it blank

Column Description

54 OPENNESS TO NEGATIVE FEEDBACK: Ability to solicit feedback and to objectively and non-defensively receive critical feedback; not overly sensitive to criticism, doesn't take self too seriously.

Codes:

1 = Very sensitive to personal criticism, tending to feel rejected or overly combative
2 = Is sensitive to criticism; tends to take himself a bit too seriously
3 = Moderately open
4 = Open to constructive criticism; learns from mistakes; doesn't take self too seriously
5 = Eagerly solicits feedback in order to improve performance; seeks critical feedback for constructive purposes; handles it very well
9 = Left it blank

Column Description

55 COMMITMENT TO SELF-DEVELOPMENT AND PERSONAL GROWTH: The ability to operate on the basis of a personal goal orientation; both plans for the future and takes the necessary steps to achieve developmental goals.

Codes:

1 = Devotes almost no attention; doesn't see need; rationalizes and intellectualizes
2 = Open to it if asked or urged; uncertain; somewhat vague; little awareness of limitations
3 = Moderate, average, or adequate; committed to professional development with little or no emphasis on personal growth and development
4 = Continues to be interested in own self-development
5 = Highly committed to self-development and growth
9 = Left it blank

Column Description

56 PERSONAL INTEGRITY: The degree to which one operates in accord-
ance with a well defined value system; sense of responsibility;
reliability; dependability; ethical.

Codes:

1 = Lacks integrity; has considerable difficulty taking
    responsibility for his behavior; has a poorly defined
    value system
2 = Some lack of integrity; tends to attribute responsibility
    to externals (people or situations) when things go wrong
3 = Average integrity; moderately responsible and dependable
4 = Above average to high integrity; basically honest with
    high personal standards; very responsible and dependable
5 = Extremely well developed and integrated value system
    with firmly held values which lend purpose and direction
    to behavior; very conscientious; highly ethical
9 = Left it blank

Column Description

57 COMMITMENT TO EXCELLENCE: Degree to which one strives to maintain
high work and performance standards: Commitment to the work
ethic; Need for achievement defined as excellence, desire for
challenge as an opportunity to excel.

Codes:

1 = Low standards or low need for achieving quality
2 = Somewhat careless; sacrifices quality or accuracy
    for speed
3 = Moderately careful, accurate; values quality and
    accuracy; dependable; reliable work output
4 = High standards of performance; desire to perform at
    a level that is somewhat above what is merely accurate,
    correct, or adequate
5 = Has very high standards of performance; has very high
    expectations of himself and/or others; seeks positions
    with challenge, meaning and an opportunity to be measured
    by personal contribution
9 = Left it blank

Column Description

58 ADMINISTRATIVE SKILLS/FOLLOW THROUGH/IMPLEMENTATION SKILLS: Ability and orientation toward carrying out tasks, following through on tasks and doing or attending to the specific activities necessary to achieve objectives.

Codes:

1 = Very poor, loses sight of administrative details
2 = Poor administrative or implementation skills; prefers
  leaving the details to others to carry through
3 = Moderate skills
4 = Good implementation skills; can attend to the details
    necessary to follow through
5 = Very good; excellent at following through and handling
    administrative tasks; excellent at project implementation
9 = Left it blank

Column Description

59 PLANNING/ORGANIZING SKILLS: Ability to set priorities and work in an organized, timely, and efficient manner (emphasis on nearer term planning).

Codes:

1 = Disorganized; doesn't plan; reactive rather than planful
2 = Somewhat disorganized; insufficient planner
3 = Moderate or average planning skills
4 = Planful and organized
5 = Very or extremely efficient; very planful; well
    organized
9 = Left it blank

Column Description

60 LEADERSHIP ABILITY: Ability to: (1) intiate structure, while (2) maintaining harmonious relations; ability to take charge and motivate others; delegate appropriately, and monitor progress.

Codes:

1 = Very low on both (1) and (2) (see definition above); has some severely limiting factor; waits for others to provide structure and direction

2 = Somewhat low on both (1) and (2); low key supervisor who delegates and lets others work in their own fashion; leads by example; more technically than management oriented; views management as merely a means to an end

3 = Moderate ability on both (1) and (2), or (1) and (2) are in opposite directions; moderate leadership ability; shows some natural leadership ability; shows potential as a leader

4 = High on (1) and (2) and not low on either (1) or (2); shows commitment to achieving organization goals through others; a good leader or manager of people

5 = High on both (1) and (2); has a working understanding of approaches to motivate others to their best efforts; provides a high level of leadership; an excellent leader or manager of others

9 = Left it blank

Column Description

61 TEAM ORIENTATION/COOPERATION: Ability to work cooperatively; ability to involve others; sensitivity to group dynamics; favors participatory decision making

Codes:

1 = Primarily an individual contributor; unable to work on a team; competitiveness gets in the way of cooperativeness

2 = Tends to avoid team effort; has some difficulty working with others

3 = Works well with peers; teams well with others; cooperative; willing to work closely with others to achieve objectives; moderately team-oriented

4 = Has a team orientation; understands and uses group dynamics; obtains input from others prior to making decisions; is team oriented; contributes to a positive team effort through... (specifies)

5 = Creates a team spirit; strong team orientation, a skillful team builder; extremely capable of using group dynamics to attain objectives

9 = Left it blank

Column Description

62 FAIRNESS TOWARDS OTHERS: Ability to be equitable; unbiased and objective in dealing with others.

Codes:

1 = Unfair or biased in treatment of others
2 = Tendency towards favoritism, self-interest, or self-indulgence in treatment of others
3 = Moderately fair
4 = Values fairness in dealing with others; is fair and compassionate
5 = Highly values fairness or is extremely fair; very equitable, just, unprejudiced, impartial, or unbiased in treatment of others
9 = Left it blank

Column Description

63 ABILITY TO DEVELOP SUBORDINATES: Ability to recognize the undeveloped potential in others and assist, suggest, or encourage their growth through career planning and training.

Codes:

1 = Lacking in ability or interest for developing subordinates or others
2 = Limited by interpersonal skills or by lack of complete understanding of others
3 = Tries to help others out; moderately able to develop subordinates
4 = A good developer of others but would be even better if...(gives suggestion)
5 = Becomes involved in mentoring relationships and draws the best out of others; really understands and strives to develop others' potential or steer them in the direction of growth
9 = Left it blank

Column Description

64 POLITICAL SAVVY: Ability to orchestrate or influence the informal political structure of the organization; ability to develop a broad network of cooperative relationships to facilitate accomplishing one's agendas.

Codes:

1 = Unable to influence events within the organization in a variety of subtle ways; politically naive
2 = Somewhat naive or reticent about organizational politics; or limited ability to exercise politics to achieve goals
3 = Moderately savvy about using political means to achieve ends
4 = Aware of strategic issues for getting things accomplished or getting ahead
5 = Highly capable of wielding influence; orchestrating events, working or using the informal power structure
9 = Left it blank

Column Description

65 ORGANIZATIONAL AWARENESS: Knowledge and sensitivity to the norms, policies, and goals of the organization; aware of the mutual impact of these with own work unit.

Codes:

1 = Difficulty seeing position as part of an organizational pattern
2 = Has a limited or modest understanding of the total organization; needs to have a broader understanding of the big picture
3 = Moderate understanding of role within the broader context of the total organization
4 = Good understanding of the management process and the total organization
5 = Has a clear sense of what he can offer and what he needs from others in an organization
9 = Left it blank

Column Description

66 EXTRA-ORGANIZATIONAL AWARENESS: Sensitivity to how social,
business, economic, and/or governmental factors and the
organization mutually impact one another; also, sensitivity to
industry-wide issues. (This is <u>not</u> a measure of technical
expertise, however.)

Codes:

    1 = Lacking, very poor, unaware
    2 = Limited in his broad understanding of business or relevant
        external factors
    3 = Moderately sensitive or aware
    4 = Has broad awareness of   X   field (e.g., health care)
    5 = Extremely aware of how external conditions affect the
        organization or vice versa
    9 = Left it blank

APPENDIX F

Column Description

   71-72 PSYCHOLOGIST'S RECOMMENDATION: This typically appears as a separate section of the report preceding the Conclusions section. The Conclusions often clarify the strength of the recommendation or the basis for not recommending a candidate. In cases where no Recommendation section appears, the Conclusions section must be read carefully to obtain a sense of the candidate's judged suitability for the job.

CODES: 2-digit code in which the first digit refers to the specific recommendation stated in the Recommendation section and the second digit refers to the strength of the candidate as suggested in the Conclusions section.

    01 =   No recommendation is stated; Conclusion emphasize candidate's limitations

    02 =   No recommendation is stated; Conclusions are equivocal

    03 =   No recommendation is stated; Conclusions indicate that candidate is very well suited for the job

    11 =   Not recommended; Conclusions emphasize candidate's limitations

    12 =   Not recommended; Conclusions indicate limitations for the specific job but suggest that this is a good candidate for some other job

    21 =   Recommended with reservations is stated in Recommendation section

    22 =   Recommended; Conclusions spell out that the recommendation is a qualified one and emphasizes limitations

    23 =   Recommended; Conclusions balances strengths and developmental needs

    24 =   Recommended; Conclusions specify that candidate is "well suited" for the job

    99 =   Left it blank

RECODED FIVE LEVEL RECOMMENDATION CRITERION:

 Recodes   = Original Codes

Missing = 01, 02, or 03

      1 = 11   Not recommended, and candidate limitations are emphasized;

      2 = 12   Not recommended, however, candidate would be good for some other position;

      3 = 21 or 22 Recommended with reservations or qualifications;

      4 = 23   Recommended, and candidate demonstrates both strengths and developmental needs;

      5 = 24   Recommended, and the report writer specified that this was a highly qualified candidate who was well suited for the position in question.

APPENDIX G

Correlation Matrix

Predictor Variable	1	2	3	4	5	6	7	8	9	10	11
1 General mental ability											
2 Analytic reasoning	58										
3 Data gathering	32	48									
4 Deliberation skill	39	62	68								
5 Practical judgment	18	20	34	32							
6 Detail orientation	16	27	33	30	28						
7 Abstract thinking	62	56	37	48	10	00					
8 Creativity	33	29	07	12	03	-12	44				
9 Intuition	10	05	-16	-11	-04	-35	25	44			
10 Long range thinking	44	49	43	52	30	13	58	31	10		
11 Curiosity	41	42	32	32	13	03	53	45	28	42	
12 Intellectual focus	29	39	42	42	41	27	25	06	-13	39	19
13 Mental agility	44	26	-02	06	04	-06	42	45	37	23	34
14 Verbal skill	37	27	06	20	06	-15	44	26	29	22	30
15 Results orientation	00	00	-18	-20	07	-03	-02	07	08	-05	04
16 Adjustment & maturity	14	20	30	33	35	10	20	13	07	32	23
17 Emotional stability	13	23	36	37	32	20	18	07	-11	27	11
18 Adaptability to change	31	27	16	23	24	-11	39	42	38	29	40
19 Decisiveness	20	13	-10	-07	12	-07	19	31	25	21	16
20 Risk taking	22	12	-22	-11	-00	-16	21	34	40	14	22
21 Tolerance for ambiguity	45	44	21	31	10	00	57	45	34	46	50
22 Tolerance for stress, etc.	17	26	27	34	36	05	23	18	17	28	25
23 Emotional expressiveness	-04	-09	-20	-25	-09	-16	03	23	31	-11	14
24 Optimism	-02	-05	-04	-12	-01	-10	-01	13	23	00	04
25 Energy & drive	18	20	-03	01	12	04	19	26	11	20	19
26 Perseverance	06	13	20	26	27	22	01	-11	-21	20	01
27 Initiative	33	28	07	17	24	00	31	40	23	35	27
28 Independence	24	22	03	08	16	03	19	22	13	21	15
29 Need for autonomy	19	12	-09	-04	-01	-09	21	31	24	17	15
30 Need for advancement	22	21	01	08	01	-07	23	20	17	18	17
31 Need for power/dominance	15	10	-12	-10	-02	-07	18	20	08	11	13
32 Interpersonal skills	04	07	16	16	23	-10	19	24	35	20	26
33 Social skill/facility	04	-01	-02	03	04	-17	14	24	36	03	17
34 Affiliativeness	-06	-05	01	-02	12	-07	-01	13	26	-02	16
35 Assertiveness	06	11	02	-01	11	01	15	20	11	12	15
36 Persuasiveness	14	18	08	15	19	-08	28	27	29	22	23
37 Insight into others	18	28	22	27	24	-03	31	17	31	32	28
38 Interpersonal flexibility	06	09	23	17	22	-03	11	13	24	16	22
39 Listening/responding skills	06	10	28	28	20	-04	12	07	14	19	15
40 Respect for others	05	06	30	23	30	07	02	03	09	19	10
41 Insight into self	29	27	27	33	29	-03	35	25	23	39	27
42 Self-confidence	17	14	-00	06	08	-02	15	21	16	16	11
43 Openness to negative feedback	20	20	26	29	28	03	21	16	11	27	26
44 Commitment to self-development	25	30	28	32	20	-02	34	27	19	41	36
45 Personal integrity	09	19	30	31	30	13	05	-00	-08	23	16
46 Commitment to excellence	24	32	36	43	30	20	25	11	-05	37	19
47 Administrative skills	00	15	34	33	33	32	-02	-22	-25	21	-04
48 Planning/organizing skills	26	39	39	48	35	19	35	12	-08	55	29
49 Leadership ability	28	37	32	37	34	09	34	29	14	50	30
50 Team orientation	08	14	28	27	24	02	17	11	12	19	18
51 Fairness/objectivity	00	07	30	28	32	10	02	07	01	19	13
52 Ability to develop others	16	22	28	29	29	-02	24	23	26	34	28
53 Political savvy	22	23	19	21	25	-03	33	33	33	32	27
54 Organizational awareness	34	32	31	32	16	08	37	20	09	51	38
55 Extra-organizational awareness	42	42	34	41	20	10	53	32	21	57	49

Correlation Matrix – continued

Predictor Variable	12	13	14	15	16	17	18	19	20	21	22
1 General mental ability											
2 Analytic reasoning											
3 Data gathering											
4 Deliberation skill											
5 Practical judgment											
6 Detail orientation											
7 Abstract thinking											
8 Creativity											
9 Intuition											
10 Long range thinking											
11 Curiosity											
12 Intellectual focus											
13 Mental agility	13										
14 Verbal skill	11	42									
15 Results orientation	-02	29	18								
16 Adjustment & maturity	24	10	20	-00							
17 Emotional stability	28	-03	08	-08	64						
18 Adaptability to change	18	15	39	25	34	22					
19 Decisiveness	07	47	28	33	11	02	39				
20 Risk taking	-02	50	34	38	10	-01	48	62			
21 Tolerance for ambiguity	16	41	36	03	29	21	55	30	40		
22 Tolerance for stress, etc.	24	18	21	01	57	51	46	20	23	39	
23 Emotional expressiveness	-16	22	08	21	-04	-14	14	20	21	11	-06
24 Optimism	-01	15	10	14	19	10	21	15	24	14	16
25 Energy & drive	12	35	18	31	13	02	23	27	32	25	13
26 Perseverance	25	-09	08	08	20	15	04	04	-00	02	15
27 Initiative	17	41	34	24	20	10	36	48	48	37	45
28 Independence	11	32	25	33	14	09	29	47	47	25	23
29 Need for autonomy	-02	38	29	31	00	-04	30	42	50	30	12
30 Need for advancement	12	33	29	25	12	03	29	28	38	23	15
31 Need for power/dominance	03	36	27	37	-01	-10	18	51	46	15	02
32 Interpersonal skills	04	19	28	04	42	31	38	09	11	27	36
33 Social skill/facility	-10	24	30	07	26	17	34	15	20	21	30
34 Affiliativeness	-07	-02	03	-05	22	14	17	-07	-04	11	16
35 Assertiveness	05	34	23	31	16	08	26	40	39	18	19
36 Persuasiveness	13	33	47	26	31	20	43	31	37	28	38
37 Insight into others	17	18	33	07	31	25	33	11	16	31	33
38 Interpersonal flexibility	06	00	16	-08	37	26	32	03	03	22	36
39 Listening/responding skills	16	-02	14	-08	37	34	18	-11	-07	14	36
40 Respect for others	18	-10	01	-05	42	38	15	-22	-18	07	32
41 Insight into self	26	19	27	-01	39	32	33	11	13	33	34
42 Self-confidence	05	28	24	20	33	23	34	40	42	28	35
43 Openness to negative feedback	20	09	09	-03	48	41	29	-01	06	24	38
44 Commitment to self-development	26	16	24	02	36	29	25	11	16	30	28
45 Personal integrity	28	-06	-03	-08	37	29	10	-08	-09	09	25
46 Commitment to excellence	32	05	12	00	25	25	16	-02	-03	15	19
47 Administrative skills	30	-18	07	06	31	29	-00	-07	-13	-05	21
48 Planning/organizing skills	37	04	15	-02	29	28	22	03	03	23	27
49 Leadership ability	32	25	25	16	42	33	41	29	21	30	39
50 Team orientation	13	-02	07	-13	39	34	24	-14	-08	16	30
51 Fairness/objectivity	16	-06	-05	-12	35	36	12	-12	-09	07	28
52 Ability to develop others	17	12	23	05	40	30	33	07	09	28	37
53 Political savvy	15	29	31	13	32	18	43	26	24	29	31
54 Organizational awareness	21	24	24	-00	29	24	28	14	13	29	23
55 Extra-organizational awareness	22	37	34	05	22	15	33	22	26	46	24

Correlation Matrix – continued

Predictor Variable	23	24	25	26	27	28	29	30	31	32	33
1 General mental ability											
2 Analytic reasoning											
3 Data gathering											
4 Deliberation skill											
5 Practical judgment											
6 Detail orientation											
7 Abstract thinking											
8 Creativity											
9 Intuition											
10 Long range thinking											
11 Curiosity											
12 Intellectual focus											
13 Mental agility											
14 Verbal skill											
15 Results orientation											
16 Adjustment & maturity											
17 Emotional stability											
18 Adaptability to change											
19 Decisiveness											
20 Risk taking											
21 Tolerance for ambiguity											
22 Tolerance for stress, etc.											
23 Emotional expressiveness											
24 Optimism	27										
25 Energy & drive	28	26									
26 Perseverance	04	02	34								
27 Initiative	20	13	46	25							
28 Independence	09	01	21	14	43						
29 Need for autonomy	14	07	22	-02	44	55					
30 Need for advancement	16	21	36	12	40	30	32				
31 Need for power/dominance	16	03	34	06	40	49	52	38			
32 Interpersonal skills	31	32	15	05	19	06	05	19	-06		
33 Social skill/facility	34	27	15	-06	17	12	13	14	05	68	
34 Affiliativeness	35	27	08	01	03	-15	-14	01	-24	62	42
35 Assertiveness	25	19	35	09	33	37	32	33	48	21	18
36 Persuasiveness	29	24	34	17	40	33	29	40	27	60	51
37 Insight into others	14	12	10	14	28	16	09	23	06	50	31
38 Interpersonal flexibility	16	23	04	06	14	01	-02	12	-13	60	40
39 Listening/responding skills	-00	20	-01	14	03	-03	-09	07	-25	53	37
40 Respect for others	-00	18	-07	14	-03	-19	-27	-04	-43	52	29
41 Insight into self	07	09	19	18	31	13	09	21	-02	45	25
42 Self-confidence	17	34	29	14	35	50	37	34	34	24	27
43 Openness to negative feedback	00	24	10	15	16	01	-08	02	-12	44	31
44 Commitment to self-development	08	15	23	25	33	04	08	31	05	35	24
45 Personal integrity	-05	09	13	31	06	-08	-23	-06	-18	25	09
46 Commitment to excellence	-07	-02	24	38	27	05	-06	16	03	20	01
47 Administrative skills	-11	-02	09	48	08	05	-09	07	-04	09	-04
48 Planning/organizing skills	-14	-04	16	28	28	17	07	19	09	18	01
49 Leadership ability	06	14	26	20	36	24	17	26	23	42	21
50 Team orientation	04	19	-01	10	-02	-20	-26	01	-32	54	30
51 Fairness/objectivity	-09	13	-03	08	02	-12	-20	-04	-27	41	21
52 Ability to develop others	12	18	14	13	20	07	-01	13	-04	51	29
53 Political savvy	14	14	23	06	32	18	17	25	13	50	37
54 Organizational awareness	-03	06	21	18	24	11	-02	22	09	28	14
55 Extra-organizational awareness	-00	03	19	08	32	17	12	24	16	25	11

Correlation Matrix – continued

Predictor Variable	34	35	36	37	38	39	40	41	42	43	44
1 General mental ability											
2 Analytic reasoning											
3 Data gathering											
4 Deliberation skill											
5 Practical judgment											
6 Detail orientation											
7 Abstract thinking											
8 Creativity											
9 Intuition											
10 Long range thinking											
11 Curiosity											
12 Intellectual focus											
13 Mental agility											
14 Verbal skill											
15 Results orientation											
16 Adjustment & maturity											
17 Emotional stability											
18 Adaptability to change											
19 Decisiveness											
20 Risk taking											
21 Tolerance for ambiguity											
22 Tolerance for stress, etc.											
23 Emotional expressiveness											
24 Optimism											
25 Energy & drive											
26 Perseverance											
27 Initiative											
28 Independence											
29 Need for autonomy											
30 Need for advancement											
31 Need for power/dominance											
32 Interpersonal skills											
33 Social skill/facility											
34 Affiliativeness											
35 Assertiveness	05										
36 Persuasiveness	28	46									
37 Insight into others	27	24	43								
38 Interpersonal flexibility	42	05	42	51							
39 Listening/responding skills	36	01	30	37	56						
40 Respect for others	52	-15	20	31	50	63					
41 Insight into self	30	10	33	57	43	41	39				
42 Self-confidence	04	39	43	20	12	08	-03	21			
43 Openness to negative feedback	34	09	23	30	40	40	48	44	21		
44 Commitment to self-development	17	11	29	42	35	35	33	56	18	46	
45 Personal integrity	25	04	20	25	20	30	45	27	06	36	31
46 Commitment to excellence	06	11	23	32	17	19	24	38	09	25	37
47 Administrative skills	02	10	14	22	17	24	28	21	02	17	21
48 Planning/organizing skills	-02	12	26	35	19	21	20	36	10	22	37
49 Leadership ability	15	30	42	46	34	33	31	43	25	37	43
50 Team orientation	46	-03	27	36	47	51	63	34	04	41	36
51 Fairness/objectivity	34	01	21	29	45	51	61	33	04	44	32
52 Ability to develop others	33	19	37	53	49	47	49	44	17	44	43
53 Political savvy	22	22	46	45	48	34	26	33	18	27	34
54 Organizational awareness	08	11	24	29	23	24	20	31	17	27	34
55 Extra-organizational awareness	04	17	24	33	16	14	08	32	20	19	37

Correlation Matrix — continued

Predictor Variable	45	46	47	48	49	50	51	52	53	54	55
1 General mental ability											
2 Analytic reasoning											
3 Data gathering											
4 Deliberation skill											
5 Practical judgment											
6 Detail orientation											
7 Abstract thinking											
8 Creativity											
9 Intuition											
10 Long range thinking											
11 Curiosity											
12 Intellectual focus											
13 Mental agility											
14 Verbal skill											
15 Results orientation											
16 Adjustment & maturity											
17 Emotional stability											
18 Adaptability to change											
19 Decisiveness											
20 Risk taking											
21 Tolerance for ambiguity											
22 Tolerance for stress, etc.											
23 Emotional expressiveness											
24 Optimism											
25 Energy & drive											
26 Perseverance											
27 Initiative											
28 Independence											
29 Need for autonomy											
30 Need for advancement											
31 Need for power/dominance											
32 Interpersonal skills											
33 Social skill/facility											
34 Affiliativeness											
35 Assertiveness											
36 Persuasiveness											
37 Insight into others											
38 Interpersonal flexibility											
39 Listening/responding skills											
40 Respect for others											
41 Insight into self											
42 Self-confidence											
43 Openness to negative feedback											
44 Commitment to self-development											
45 Personal integrity											
46 Commitment to excellence	41										
47 Administrative skills	30	34									
48 Planning/organizing skills	27	45	43								
49 Leadership ability	32	40	26	48							
50 Team orientation	40	22	15	16	40						
51 Fairness/objectivity	43	27	24	26	34	48					
52 Ability to develop others	36	30	20	35	67	56	52				
53 Political savvy	11	16	07	21	49	32	22	47			
54 Organizational awareness	24	30	13	36	43	32	22	36	42		
55 Extra-organizational awareness	16	28	04	37	39	20	14	33	37	67	

Note. Decimals have been omitted for legibility.
N = 392, listwise deletion.

APPENDIX H

Table H - 1

Composition, Item-total Correlations, and Alpha Coefficients for

Personality Scales Derived from the Five and Twelve Factor Models

($\underline{N}$ = 392)

Factor	Variable	Factor Model	
		Five	Twelve
1 - HUMAN RELATIONS			
	Interpersonal skill	.79	.81
	Respect for others	.66	.66
	Interpersonal flexibility	.69	.70
	Listening skills	.64	.66
	Affiliativeness	.57	.56
	Social skills	.52	.55
	Fairness/objectivity	.55	.55
	Team orientation	.64	.63
	Insight into others	.59	.54
	Openness to feedback	.57	.53
	(Political savvy)	.51	.51
	Development of others	.68	---
	Emotional Expressiveness	.19	---
	Optimism	.31	---
	Self-development	.52	---
	Insight into self	.58	---
	Persuasiveness	---	.51
	Number of items	16	12
	Cronbach's alpha	.90	.89
2 - AUTONOMOUS ACTION ORIENTATION			
	Independence	.62	.65
	Need for autonomy	.59	.62
	Need for power	.61	.66
	Decisiveness	.64	.65
	Risk oriented	.69	.68
	Self-confidence	.57	.54
	Initiative	.62	.58
	Results oriented	.45	.44
	Assertiveness	.56	.54
	Need to advance	.52	.48
	Adaptability to change	.48	---
	Persuasiveness	.55	---
	Energy	.47	---
	Number of items	13	10
	Cronbach's alpha	.88	.87

3 - CONCEPTUAL SKILLS

Abstract thinking	.77	.77
General ability	.65	.65
Analytic reasoning	.64	.68
Curiosity	.62	.61
Ambiguity tolerance	.64	.62
Deliberation skill	.51	.57
Creativity	.48	.47
Long range thinking	.65	.63
Mental agility	.49	.43
Verbal skill (articulation)	.45	---
Organizational awareness	.52	---
Extra-organizational "	.68	---
Data gathering skill	---	.45
Number of items	12	10
Cronbach's alpha	.89	.87

4 - WORK MOTIVATION

Perseverance	.47	.49
Administrative skill	.58	.57
Practical judgment	.49	.50
Detail oriented	.40	.35
Commits to excel	.54	.54
Intellectual focus	.52	.48
Planning skills	.57	.53
Integrity	.45	.44
Data gathering skill	.54	---
Intuition (reverse scored)	.19	---
Leadership	.42	---
Number of items	11	8
Cronbach's alpha	.80	.78

5 - EMOTIONAL ADJUSTMENT

Stability	.64	.64
Maturity & adjustment	.70	.70
Stress tolerance	.60	.60
Number of items	3	3
Cronbach's alpha	.80	.80

6 - VITALITY

Energy	---	.34
Expressiveness	---	.35
Optimism	---	.34
Number of items	0	3
Cronbach's alpha	---	.52

7 - BROAD SCOPE THINKING

Organizational awareness	---	.67
(Extra-organizational)	---	.67
Number of items	0	2
Cronbach's alpha	---	.80

8 – <u>SELF-INSIGHT</u>

Self-development	---	.57
Insight into self	---	.57
Number of items	0	2
Cronbach's alpha	---	.73

9 – <u>VERBAL ARTICULATION</u>

Verbal skill ($\underline{r}$ = .58)	---	---
Number of items	0	1
Cronbach's alpha	---	---

10 – <u>LEADERSHIP</u>

Leadership	---	.69
Develops others	---	.69
Number of items	0	2
Cronbach's alpha	---	.80

11 – <u>ADAPTABILITY</u>

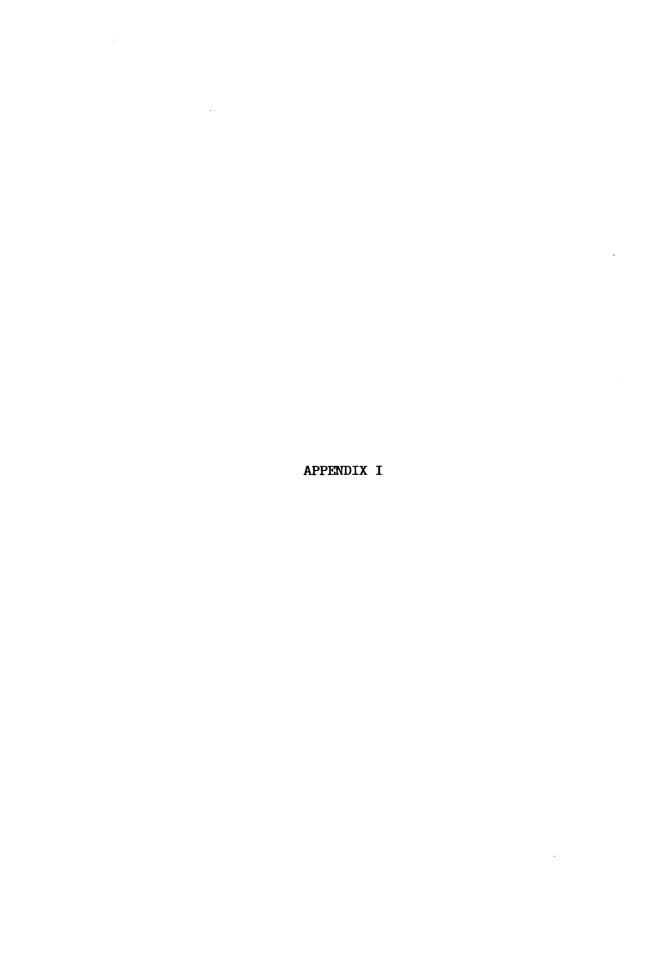|		
Adapts to change	---	.38
Intuition	---	.38
Number of items	0	2
Cronbach's alpha	---	.55

Table H - 2

Internal Consistency and Item-total Correlations

of the Consulting Firm's A Priori Dimensions of Personality

Firm's a priori scales	Corrected Item-total Correlation	Alpha
I. INTELLECTUAL EFFECTIVENESS (14 items)		.84
General mental ability	.65	
Analytic reasoning	.68	
Data gathering ability	.48	
Deliberation skills	.58	
Practical judgment	.30	
Detail orientation	.13	
Abstract thinking ability	.73	
Creativity	.44	
Intuition	.16	
Long range thinking	.63	
Curiosity	.58	
Intellectual focus	.41	
Mental agility	.44	
Verbal skill	.40	
II. EMOTIONAL MATURITY (20 items)		.84
Overall maturity & adjustment	.38	
Emotional Stability	.23	
Tolerance for stress, etc.	.43	
Adaptability to change	.57	
Decisiveness	.56	
Risk taking orientation	.61	
Tolerance for ambiguity	.47	
Emotional expressiveness	.22	
Optimism	.27	
Energy and drive	.52	
Results orientation	.36	
Perseverance	.23	
Initiative	.64	
Independence/self-reliance	.53	
Need for autonomy	.47	
Need for advancement	.48	
Need for power	.47	
Assertiveness	.52	
Personal integrity	.11	
Commitment to excellence	.24	

Table H-2   continued

III. SKILL IN HUMAN RELATIONS (5 items)   .81

    General interpersonal skill   .83
    Social skill/facility   .64
    Affiliativeness   .53
    Influence/persuasiveness   .53
    Listening skill   .49

IV. INSIGHT (7 items)   .79

    Insight into self   .67
    Openness to negative feedback   .57
    Self-confidence   .20
    Commitment to self-development   .57
    Insight into others   .58
    Interpersonal flexibility   .58
    Respect for others   .49

V. ORGANIZATION AND SUPERVISION (9 items)   .82

    Administrative skills   .28
    Planning/organizing/priortizing   .50
    Leadership ability   .70
    Team orientation   .50
    Fairness/objectivity re others   .47
    Ability to develop others   .70
    Political savvy   .50
    Organizational awareness   .57
    Extra-organizational awareness   .48

APPENDIX I

Table I

Reliability of the Final Set of Predictor Dimensions

Predictor Dimensions and Items	Alpha or $(\underline{r})^a$	Corrected Item-total Correlation
HUMAN RELATIONS SKILLS (HR): (12 items)	.90	
Interpersonal flexibility		.67
Overall interpersonal skills		.72
Listening skills		.67
Fairness and objectivity toward others		.61
Respect for others		.70
Openness to feedback		.38
Affiliativeness		.52
Team orientation		.67
Insight into others		.49
Ability to develop others		.68
Insight into self		.50
Commitment to self-development		.53
DECISIVE INDEPENDENCE (DI): (5 items)	.73	
Independence from others		.57
Decisiveness		.53
Self-confidence		.55
Results orientation		.37
Ability to persuade and influence others		.46
RISK/POWER ORIENTATION (R/P): (6 items)	.80	
Risk taking orientation		.61
Need for power and/or control		.63
Need for autonomy		.58
Assertiveness		.50
Initiative		.57
Ambition and need for advancement		.49
CONCEPTUAL PROBLEM SOLVING (CPS): (7 items)	.84	
Abstract/conceptual thinking ability		.73
General mental ability		.63
Analytic reasoning/incisive thinking		.70
Deliberation skills		.60
Data gathering skills		.50
Curiosity/inquisitiveness		.57
Creativity/innovativeness		.38

Table I continued

TOLERANCE FOR UNCERTAINTY (TU): (3 items)   .64

        Tolerance for ambiguity and complexity   .56
        Long range thinking ability/farsightedness   .43
        Mental agility   .38

WORK MOTIVATION (WM): (8 items)   .78

        Perseverance   .49
        Administrative skill/implementation/follow through   .57
        Practical judgment   .50
        Detail orientation   .35
        Commitment to excellence/high work standards   .54
        Intellectual focus and mental discipline   .48
        Planning/organizing/prioritizing skills   .53
        Personal integrity   .44

EMOTIONAL ADJUSTMENT (EA): (3 items)   .80

        Emotional stability   .64
        Overall adjustment and maturity   .70
        Tolerance for stress, pressure, and frustration   .60

VITALITY (V): (3 items)   .52

        Energy and drive   .34
        Emotional expressiveness   .34
        Optimism   .33

ORGANIZATIONAL SCOPE (OS): (1 item)   (.81)

        Awareness of broad organizational issues   ——

SOCIAL FACILITY (SF): (2 items)   .46

        Social ease   .30
        Verbal presentation, articulation, and expression   .30

LEADERSHIP (L): (1 item)   (.75)

        Leadership Ability   ——

ADAPTABILITY (A): (2 items)   .55

        Adaptability to change   .38
        Intuitive sense   .38

Note. Two of the original trait variables (political savvy and extra-organizational awareness) were omitted.
[a]Pearson r based on Sample 2 assessment of interrater agreement ($n=25$).

APPROVAL SHEET

The dissertation submitted by Loretta Postillion van der Plas has been read and approved by the following committee:

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

4/16/86
Date

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