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Investigating a Background Data Measure of Social Intelligence

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Some current measures of social intellignece have been judged as weak and ineffective, despite attempts to develop measures that do not emphasize verbal ability. This paper examines the construct validity of a background data, or life history measure, of social intelligence. Analyses suggest that the measure has high reliability, convergent validity with other measures of verbal intelligence. Criterion-related validity is supported using an individual's peer reanking of performance effectiveness in a team setting. Results suggest that further examination of a background data meausre of social intelligence is warranted, and its relationship to individual performance should be investigated in a variety of appropriate team settings.

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FOREWORD

The Manpower and Personnel Research Division (MPRD) of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) performs research on manpower and personnel issues of particular significance to the U.S. Army. During FY93, MPRD conducted research on determinants of effective individual performance in Army team settings. This report describes the investigation of social intelligence, one of the individual characteristics that is relevant to individual performance in team settings. It describes a definition of social intelligence and the evaluation of a survey to measure this construct. Finally, it presents preliminary psychometric evidence concerning the validity of the measure.

ARI's participation in this effort is part of an ongoing program of research designed to enhance the quality of Army personnel. This work is an essential component of the mission of MPRD to conduct research to help manage the force effectively and efficiently.

EDGAR M. JOHNSON
Director

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INVESTIGATING A BACKGROUND DATA MEASURE OF SOCIAL INTELLIGENCE

EXECUTIVE SUMMARY

Research Requirement:

To examine determinants of individual performance on team tasks during the Special Forces assessment program; to support the efforts of the U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) to attract, select, and train the highest quality soldiers for Special Forces (SF).

Procedure:

Army soldiers, 189 males, completed surveys which included several measures of social intelligence: a background measure of social intelligence (Gilbert, Connelly, Mumford, & Zaccaro, 1992), the Lennox and Wolfe (1984) measure of self-monitoring, and the two most reliable subscales of O'Sullivan and Guilford's (1975b) test of social intelligence, "Cartoon Predictions" and "Social Translations." The background measure included four subscales: perceptiveness, behavioral flexibility, social competence, and systems perception (Zaccaro, Gilbert, Thor, & Mumford, 1991). Data on two measures of verbal intelligence, the Wonderlic and the Armed Services Vocational Aptitude Battery General Technical score (ASVAB GT score), were obtained from records. Peer rankings were collected following a series of physical group activities and were used to assess the criterion-related validity of the measures.

Findings:

Results supported the psychometric reliability and validity of the background measure of social intelligence. The internal consistencies of subscales of the social intelligence measure were high. A factor analysis of the social intelligence background items suggested that the items loaded onto three factors. The items from interpersonal perception and systems perception loaded onto one factor, interpreted as "social perceptiveness." The items from behavioral flexibility loaded onto two factors; these were interpreted to be subcomponents of behavioral flexibility and were labeled social flexibility and defensive rigidity.

Social perceptiveness and behavioral flexibility were significantly related to the Lennox and Wolfe social intelligence measures, supporting the convergent validity of the measure. Social perceptiveness was also significantly related to the O'Sullivan and Guilford (1975b) subscales, although this

correlation was low. Behavioral flexibility was not significantly related to the O'Sullivan and Guilford (1975b) subscales. Social perceptiveness and behavioral flexibility were not significantly correlated with the verbal intelligence measures, supporting the divergent validity of the measures. The O'Sullivan and Guilford (1975b) measures, however, were significantly correlated with the verbal intelligence measures.

A factor analysis performed on the entire set of social intelligence and verbal intelligence scales suggested that the scales loaded onto three factors. The first factor included social perceptiveness scales, social competence, and Lennox and Wolfe's (1984) sensitivity and self-presentation scales. The second factor included the Wonderlic, the ASVAB GT Score, and O'Sullivan and Guilford's (1975b) social translations and cartoon predictions scales. The third factor contained only the behavioral flexibility scale of the background measure. This demonstrates further support for the discriminant validity of the background measure of social intelligence from verbal intelligence.

The criterion-related validity of the measure was also supported, with a small but significant positive correlation between peer rank and the social perceptiveness and social competence scales, but not with any of the verbal intelligence measures.

Utilization of Findings:

Many measures of social intelligence have not been able to appropriately discriminate social intelligence from verbal intelligence. These background data scales can be used as an alternative format, and their construct validity has been supported in this report. While this measure is a promising new instrument for this construct, its psychometric properties should be further investigated. The ability of this instrument to predict individual performance within teams should be examined in a variety of settings. These findings advance our understanding of the determinants of individual performance in teams, and after further testing, the background data measure may be useful in selecting individuals for team settings.

INVESTIGATING A BACKGROUND DATA MEASURE OF SOCIAL INTELLIGENCE

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INVESTIGATING A BACKGROUND DATA MEASURE OF SOCIAL INTELLIGENCE

INTRODUCTION

Team effectiveness and high level performance requires team members to successfully coordinate, synchronize, and integrate their individual actions. Fleishman and Zaccaro (1992) identified several performance functions that are related to effective team coordination. These include information exchanges among team members, assignments of task and role responsibilities, timing and coordination of member activities, development of team performance norms and other motivational enhancements, monitoring of member activities, and maintenance of team procedures. These functions suggest that when acting as a team, members are required to monitor both the internal and external environments of their team, recognize situational demands and requirements, and be able to coordinate and maintain an effective team response to these demands.

The antecedents that determine the quality of these performance functions include task characteristics, team characteristics, and member characteristics (Fleishman & Zaccaro, 1992; Hackman & Morris, 1975). Task characteristics refer to the process requirements imposed by the task on team members. For example, Steiner (1972) distinguishes between unitary tasks, where team members complete the same activities and the group product is some combination of these efforts, from divisible tasks, where each team member completes a qualitatively different activity and their individual products are integrated to define the group product. The level and intensity of the aforementioned performance functions will vary considerably according to whether the team is confronted by a unitary or a divisible task.

Team characteristics affecting performance functions include group size, group cohesion, and group structure. Large groups will be less efficient in their coordination activities than smaller groups (Fleishman & Zaccaro, 1992; Gooding & Wagner, 1985). Group cohesion can enhance the willingness of team members to coordinate their efforts as well as to maximize their efforts on behalf of the team, particularly during periods of stress (Fleishman & Zaccaro, 1992; Zaccaro, Gualtieri, & Minionis, in press). Finally, groups that are organized in a hierarchical or centralized structure will have a different pattern of interaction and coordination than groups with more decentralized structures. These patterns will vary also according to problem complexity (Shaw, 1964).

Individual qualities that influence how well members complete team performance functions include member intelligence, task-specific knowledge and abilities, and personality variables such as dominance, extraversion, and a general social orientation (Bouchard, 1969; Heslin, 1964; Mann, 1959; Shaw, 1981). This

report focuses on one such individual characteristic, social intelligence, as a possible basis for effective performance in team settings. Several studies have demonstrated that a variety of social competencies, resulting presumably from high social intelligence (e.g., empathy, social sensitivity, social insight, sociability, self-monitoring), were positively associated with team performance and team leadership (Bass, 1990; Bouchard, 1969; Connelly, Zaccaro, & Mumford, 1992; Mumford, O'Connor, Clifton, Connelly, & Zaccaro, 1993; Shaw, 1981; Zaccaro, Foti, & Kenny, 1991a). Social intelligence is linked to increased sensitivity to social information and a greater likelihood of selecting situationally appropriate responses (Zaccaro, Gilbert, Thor, & Mumford, 1991b). This combination facilitates team performance by enhancing the coordination capabilities of team members.

Despite the importance of social intelligence as a potential predictor of an individual's performance in team settings, conceptual ambiguities and measurement difficulties have created a major impediment to research on its relationships with team performance variables (Walker & Foley, 1973). This report summarizes a preliminary investigation of a background data measure of social intelligence (Gilbert, Connelly, Mumford, & Zaccaro, 1992). Because background data measures possess several advantages over other paper and pencil formats (Mumford & Owens, 1987), such a measure of social intelligence should be superior to prior measures that have been judged as weak or ineffectual (Cronbach, 1960; Walker & Foley, 1973). This possibility is the basis for the investigation described in this report.

Social Intelligence: Definitions and Prior Measurement Strategies

Social intelligence was first distinguished from other forms of intelligence by Thorndike (1920) who defined it as "the ability to understand and manage men and women, boys and girls -- to act wisely in human relations"(p. 228). This definition suggests two critical aspects or components of social intelligence. The first is social understanding, or an awareness of social information and the psychological dynamics of other individuals. The second aspect refers to a behavioral competence in social domains, or the display of situationally effective behaviors.

One or both of these two factors have been incorporated in definitions of social intelligence since 1920. Table 1 contains a sample of 14 definitions from this literature. Nine of these definitions explicitly include an individual's social awareness. Zaccaro, Gilbert, Thor, and Mumford (1991) specified this quality as social perceptiveness and defined it with respect to organizational leadership as

a capacity to be particularly aware of and sensitive to

Table 1

Definitions of Social Intelligence

1. the ability to understand and manage men and women, boys and girls --to act wisely in human relations (Thorndike, 1920, p. 228)

2. ability to get along with others (Moss & Hunt, 1927, p. 108)

3. ability to deal with people (Hunt, 1928, p. 317)

4. the ability to deal successfully with people, to understand the feelings and motives of others and to be able to get along with them (Moss, 1931, p. 180)

5. ability to adjust to new situations involving relations with other people and to adopt a course of action which is effective in the sense that it leads others to do consistently and voluntarily the thing it is desired that they should do (Bureau of Public Personnel Administration, 1930, p. 73).

6. ability to get along with people in general, social technique or ease in society, knowledge of social matters, susceptibility to stimuli from other members of a group, as well as insight into the temporary moods or underlying personality traits of friends and of strangers (Vernon, 1933, p. 44)

7. ability to understand and manage people (Thorndike & Stein, 1937, p. 275).

8. facility in dealing with human beings (Wechsler, 1958, p. 8)

9. the ability to understand the inner feelings or affect states of other persons (Hoepfner & O'Sullivan, 1968, 339-344).

10. the ability to understand other people's thoughts, feelings, and intentions (O'Sullivan & Guilford, 1975a, p. 256).

11. one's ability to accomplish relevant objectives in specific social settings (Ford & Tisak, 1983, p. 197).

Table 1 (cont.)

12. the ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding (Marlowe, 1986, p. 52).

13. the cognitive basis of personality can be conceptualized as the declarative and procedural knowledge that individuals bring to bear in interpreting events and making plans in every day life situations. These concepts, personal memories, and interpretive rules are the cognitive structures of personality; together they constitute the expertise that guides an individual's approach to the problems of social life. We refer to this knowledge repertoire as social intelligence (Cantor & Kihlstrom, 1987, p. 3).

14. effective leaders have a degree of social intelligence that results in accurate perceptions of social requirements and the selection of appropriate behavioral responses (Zaccaro, Gilbert, Thor, & Mumford, 1991b).

> needs, goals, demands, and problems at multiple system levels, including individual members, relations among members, relations among organizational subsystems, and interactions among a leader's constituent organization and other systems in the embedding environment (p.321).

The emphasis here is not only on the understanding of individual states and requirements, but also of those interactions and dynamics that occur within and across groups and organizations. Thus, social intelligence has as its focus the accurate perception and judgement of both individuals and social systems.

Twelve of the 14 definitions in Table 1 contain a reference to social behavioral competence. Typically, this competence reflects an ability to act appropriately in situations and achieve one's socially-oriented goals. Zaccaro et al. (1991b) define this competence more specifically as "the ability and willingness to respond in significantly different ways to correspondingly different situational requirements" (p. 322). A key element of this ability is behavioral flexibility; socially intelligent individuals can respond equally well to very different social demands. Such flexibility requires a large and broad response repertoire and, perhaps more importantly, a cognitive capacity to match responses to particular social requirements. Also, the behavioral competence underlying social intelligence reflects a strong motivational component that emphasizes socially-oriented values and a commitment to others. This is similar to the concept, "Motivation to Attend to Others" cited by Busciglio, King, & Palmer (1991) as an antecedent to social intelligence.

More recent work on social intelligence has emphasized the role of social knowledge structures as the basis of socially competent behavior (Busciglio, et al., 1991; Cantor & Kihlstrom, 1985, 1987; Wagner & Sternberg, 1985; Zaccaro et al., 1991b). For example, Cantor and Kihlstrom (1987) defined social intelligence as "the declarative and procedural knowledge directed at the tasks of social life" (p. 71). Declarative social knowledge refers to information about people and expected action sequences in specific social settings, while procedural social knowledge refers to the rules and processes for dealing with social information (see also Cantor & Kihlstrom, 1985; Zaccaro et al., 1991b). Busciglio et al. (1991) also argued that tacit social knowledge represents a key component of social intelligence. This knowledge is derived from specific prior experiences across multiple social situations and is used to develop inferences about appropriate responses in present and future social situations.

Zaccaro et al. (1991b) tie enriched social knowledge structures to both social perceptiveness and behavioral flexibility. Social perceptiveness emerges from well developed

and elaborated cognitive representations of social information that allow socially intelligent people to discern more fine-grained distinctions among types of persons, situations, and social episodes (Cantor & Kihlstrom, 1985; 1987). Behavioral flexibility results from enriched episodic knowledge structures that contain a wide variety of behavioral scripts with fine tuned action cues that facilitate appropriate situational matching (see Abelson, 1981, on the role of action cues in behavioral scripts). This view of social intelligence, together with those offered by Cantor and Kihlstrom (1985; 1987) and Busciglio et al. (1991), emphasizes a social expertise grounded in highly developed social information stores.

A critical question regarding social intelligence has been its conceptual distinctiveness from other forms of intelligence. In an early review of the social intelligence literature, Thorndike and Stein (1937) reported a median correlation between abstract intelligence and social intelligence to be .57. Further, they noted this correlation to be understated because of range restriction from select samples and because it reflects correlations not corrected for attenuation. This review also reported a study by one of the authors (Stein, 1935) that found that the average correlation among subtests of the leading measure of social intelligence was actually marginally lower (.335) than the average correlation between these subtests and tests of mental alertness (.344). In a subsequent review, Cronbach (1960) reported that "after fifty years of intermittent investigation ...social intelligence remains undefined and unmeasured" (p. 319).

Walker and Foley (1973) completed a review of five leading measures of social intelligence (George Washington Social Intelligence Test, Chapin Social Insight Test, Dymond Rating Tests, Feffer's Role-taking Test, and Guilford's Six Factor Tests of Social Intelligence) and found, at best, equivocal evidence for a distinction between abstract and social intelligence. Finally, Keating (1978) examined three measures of cognitive abilities and three measures of social intelligence and found that intradomain correlations were not significantly larger than interdomain correlations. Thus, he found no evidence for the convergent and discriminant validity of social intelligence.

Several reasons have been offered for this validation failure. Thorndike and Stein (1937) noted that early measures of social intelligence were "heavily loaded with ability to work with words and ideas" (p. 282). Cognitive abilities such as verbal reasoning that underlie abstract intelligence influence scores on verbal and semantic measures of social intelligence and thus mask its effects (Cronbach, 1960; O'Sullivan & Guilford, 1975a; Walker & Foley, 1973). Accordingly, several researchers have suggested that nonverbal measures of social intelligence be developed and administered (e.g., Thorndike, 1920; Thorndike &

Stein, 1937; Walker & Foley, 1973; Marlowe, 1986).

Whether the use of such measures can significantly improve the discriminant validity of social intelligence, however, remains unclear. Guilford and his colleagues (Guilford & Hoepfner, 1971; Hoepfner & O'Sullivan, 1968; O'Sullivan & Guilford, 1975a) developed their Six Factor Test of Social Intelligence, using as stimuli photographs, cartoons, and tape recordings to avoid the interference of semantic and verbal abilities. Hoepfner and O'Sullivan (1968) reported a mean of .40 across correlations corrected for attenuation between the six social intelligence factors on this test and IQ. Walker and Foley (1973) summarized additional validation studies of this measure and found consistent significant relationships between measures of abstract intelligence and scores on the Six Factor Tests; however, the magnitude of these relationships generally did not exceed .40.

Thus, while suggestions for nonverbal tests of social intelligence have been longstanding (e.g., Thorndike, 1920; Thorndike & Stein, 1937), little strong evidence exists suggesting a major improvement in the discriminant validity of social intelligence through the use of such tests. Further, the format of a test should be amenable to its efficient administration as a standardized instrument. Such efficiency is diluted the further removed a test is from a paper-pencil format.

A second reason for the lack of discriminant validity demonstrated for social intelligence is that most prior operationalizations focus primarily on social perceptiveness, accuracy, and understanding, neglecting the factor of behavioral effectiveness in social domains (Ford & Tisak, 1983; Marlowe, 1986; Walker & Foley, 1973). For example, the subtests of the George Washington Social Intelligence Test were (a) judgment in social situations, (b) ability to recognize faces and matching names, (c) observation of human behavior and understanding of underlying motives, (d) recognition of the mental states or motives behind words, (e) recognition of mental states or motives from facial expression, and (f) level of general social information (Moss, 1931; Walker & Foley, 1973). None of these factors deal explicitly with behavioral effectiveness. Likewise, Guilford and his colleagues specifically restrict their measure of social intelligence to "the ability to understand other people's thoughts, feelings, and intentions" (O'Sullivan & Guilford, 1975a, p. 256).

One reason behind these limited operationalizations is that behavioral effectiveness in social domains demands a high degree of social awareness and understanding. While individuals may understand the demands, requirements and psychological dynamics of a particular social situation, they may lack the appropriate situational response in their skill repertoire; alternatively,

individuals may have a wide range of social skills, but lack the insight to match these skills to social requirements. Neither instance would fully define social intelligence.

When social intelligence measures have incorporated behavioral effectiveness in social domains, their discriminant validity becomes more pronounced. For example Ford and Tisak (1983), using a mix of measures based on social effectiveness and competence, found strong evidence for discrimination between social and academic intelligence. Marlowe established the independence of social intelligence in two studies by also operationalizing it as social effectiveness (1986; Marlowe & Bedell, 1982). Further, he demonstrated this validity using a paper-pencil approach (i.e., true/false format) that apparently was not confounded by academic or verbal abilities. Taken together, these studies indicate the importance of including behavioral competence in operationalizations of social intelligence. The most appropriate measures are likely to be those that reflect both factors of social perceptiveness and behavioral effectiveness. Further, as suggested by Zaccaro, et al. (1991b), measures of behavioral competence should more directly assess response flexibility and the situational appropriateness of social behaviors.

A third reason for the inadequacy of prior social intelligence measures is their lack of connection to actual or "real-life" social contexts (Cantor & Kihlstrom, 1987). Ford and Tisak (1983) noted that "most social intelligence tests have little or nothing to do with one's actual competence in salient social situations" (p. 198). Accordingly, they argue for measures that incorporate the richness of respondents' actual and ongoing social domains. Their successful validation of social intelligence included such measures.

Thus, through much prior research on social intelligence, several recommendations have emerged regarding its measurement. First, the most desirable format is a paper-pencil one that is immune to or at least minimizes interference from verbal, academic, or abstract intelligence. Such a format would be efficient with respect to test administration and standardization and contribute to discriminant validity. Second, the measure should operationalize both social perceptiveness and flexible behavior in accordance with situational requirements. Third, the measure should place respondents in socially relevant and meaningful scenarios. This report examines a background data measure of social intelligence that incorporates these recommendations (Gilbert, Connelly, Mumford, & Zaccaro, 1992).

Background Data Measurement

Background data, or life history measures, are based on the premise that past patterns of an individual's behavior in

particular situations are predictive of future behavior patterns (Mumford & Owens, 1987; Mumford & Stokes, 1992). Such measures are typically self-report and ask individuals to respond to questions regarding developmentally-relevant events and situations in their past life history. Such items may refer to two general scenarios (Mumford & Stokes, 1992; Mumford, Threlfall, & O'Connor, 1992). The first are developmental environments that condition certain individual characteristics (e.g., "How often did your parents take you to museums?"). The second scenario references an individual's typical behavior patterns in developmentally significant events (e.g., "What was your grade point average during your first semester in college?"). By assessing such responses across a diverse and broad spectrum of relevant situations, background data measures provide a fairly accurate representation of how individuals are likely to behave in future and relatively novel situations.

Because background data items measure typical individual responses across multiple scenarios, they can be effective indices of dispositional properties and individual difference characteristics such as personality, cognitive capacities, affective qualities, and motivational variables. Indeed, by using a rational keying method, background data scales can be developed that are keyed to meaningful psychological properties. Mumford and Stokes (1992) specify three steps in the construction of rationally-keyed background data scales. The first is to define either the target situations in which the criterial behaviors are most likely to be operative or the situations that encapsulate the most likely developmental antecedents of the specified behavioral outcomes. This step identifies the life history events and situations that are most relevant for the population being sampled regarding the targeted criteria.

The next step is to define the knowledge, skills, abilities, and other psychological constructs (KSAOs) that underlie the criterial behaviors. Mumford and his colleagues suggest that such variable specification be accomplished through a job or task analysis that provides data on behavioral requirements for performance, particularly those behaviors differentiating successful and unsuccessful performers (Mumford & Owens, 1987). Such analyses may also focus on the psychological constructs that determine the nature of these behaviors. A second method of variable specification is to analyze the existing theoretical and empirical literature regarding the specified criterial behaviors, in order to identify key determinants.

The third step in the construction of rationally-keyed background data scales is to generate items that sample the behaviors and experiences theoretically linked to the psychological construct of interest. Mumford and his colleagues suggest that item generation proceed through a panel of trained individuals who are provided with a theoretical and operational

definition of the construct being considered. Each panel member then generates a series of items based on developmental experiences hypothesized to underlie the construct. The item pool is thoroughly reviewed and approximately 40 items are retained for further analysis (see Mumford & Owens, 1987, and Mumford et al., (1992) for additional procedures on item generation and screening).

A number of studies have demonstrated strong psychometric and measurement properties for background data scales (see reviews by Mumford & Owens, 1987; Mumford & Stokes, 1992; and Mumford, et al., 1992). Despite their self-report format, appropriately constructed scales provide fairly accurate reports of prior life history events, particularly when correlational methods are used to assess accuracy (i.e., in comparisons with objective data). Also, such scales are relatively immune to faking and socially-desirable responding. They exhibit fairly good reliability and robust construct and predictive validity coefficients. Finally, by tapping individual responses across a wide variety of real-life situations, background data scales provide an accurate assessment of an individual's typical rather than maximum performance level. Thus, such scales are likely to more successfully predict actual, as opposed to potential, behavior in future targeted situations.

These qualities make background data methodology particularly appropriate for the assessment of social intelligence. Background data measures use cost-effective paper-pencil formats that facilitate administration and can reliably measure complex cognitive capacities (Mumford et al., 1992). Thus, they have an advantage over more cumbersome nonverbal measures of social intelligence. Further, the content of the items and the procedures for their development suggest that a scale can be created for social intelligence that should be independent of academic or practical intelligence. Also, by surveying a variety of situations, events, and experiences that are developmentally relevant to respondents, a background data measure can provide a "real-life" or situationally realistic assessment of social intelligence. Thus, background data or life history methods appear to offer many of the prescriptions urged by researchers for the measurement of social intelligence.

Development of a Background Data Measure of Social Intelligence

The procedures that were developed by Mumford and his colleagues were used to create background data scales measuring social intelligence (Mumford & Owens, 1987; Mumford & Stokes, 1992; Mumford, et al., 1992). The first step was the convening of a panel of nine individuals experienced in the methodology of background data. Some of these panel members were also well-versed in the extant social intelligence literature. The panel

was asked to generate items related to social perceptiveness, behavioral flexibility, and social competence. They were given specific theoretical and operational definitions of each aspect of social intelligence to guide their item construction (see Zaccaro et al., 1991b for further discussion of each social intelligence dimension). The relevant domains and populations were broadly specified to facilitate their application across multiple and diverse samples. Each panel member generated approximately 10-15 items. Then, each item was assessed by the entire panel for its appropriateness and fit to socially intelligent behavior and for its susceptibility to response biases. Standard criteria for evaluating the background data items were used (see Mumford & Stokes, 1992; Mumford et al., 1992).

Table 2 contains the final item pool that resulted from these efforts. One set of items refers to the capacity to be socially perceptive. Some of these items tap an individual's awareness of other people's intentions, needs, and problems. These items assess interpersonal perceptiveness. Other items tap an individual's understanding of aggregate level dynamics, such as group goals, organizational processes, and conflicts between and among groups and organizations. These items assess system perceptiveness. Another set of items refers to situational responsiveness. They tap the degree to which the respondent generally uses appropriate behaviors across a diverse spectrum of social situations. The panel also developed a set of items that refer to successful social accomplishments, and assess demonstrated social competence (also in Table 2). This scale corresponds to the operationalization of social intelligence offered by Ford and Tisak (1983) and Marlowe (1986). It also provides a source of validation for the social perceptiveness and response flexibility scales.

The following section of this report describes the initial psychometric assessment of these measures.

METHOD

Sample and Tasks

189 male soldiers served as the sample for this study. The sample contained 25 officers and 164 enlisted personnel. Their average tenure in the military was 4.7 years. As part of an ongoing three-week assessment program, the soldiers were randomly assigned to teams of 10-12 members and asked to participate in a series of 2 physical endurance events a day for 5 days. The events required varying degrees of team cooperation in manually transporting large and/or heavy objects (e.g., jeep, logs), and the leadership role was rotated across the events. The soldiers were being assessed individually, not as a team. Most team members did not know each other prior to these exercises.

Table 2.

Background Data Measure of Social Intelligence

1. How long has it taken you to figure out when someone just wasn't going to fit in the group? (SYS PERC[a])

2. How comfortable are you in working with different groups having very different goals and agendas? (BEH FLEX[b])

3. To what extent have you sensed when trouble was likely to arise? (INT PERC[c])

4. How often have you wished you hadn't said something after you said it? (SOC COMP[d]/trial item)

5. How comfortable are you working on a variety of different projects? (BEH FLEX)

6. How long does it take you to figure out when someone is upset? (INT PERC)

7. How difficult is it for you to work with different groups of people at the same time? (BEH FLEX)

8. How difficult is it for you to figure out why people were having problems? (INT PERC)

9. How often have people become angry with you for no reason? (SOC COMP/trial item)

10. How difficult has it been for you to recognize people's special capabilities? (INT PERC)

11. When growing up, how likely were you to realize something was bothering a close friend? (INT PERC)

12. How difficult has it been for you to remember the names and faces of new acquaintances? (INT PERC)

13. How difficult have you found it to figure out a friend's mood just by looking at them? (INT PERC)

14. How difficult has it been for you to figure out when it was a good time to ask for favors? (INT PERC)

15. To what extent have you been able to predict group decisions before they occur? (SYS PERC)

Table 2 (cont.)

16. How difficult is it for you to know what mood your friends are in ? (INT PERC)

17. To what extent would your friends describe you as someone who is good at "reading people"? (INT PERC)

18. How easy has it been for you to tell when personal problems are bothering a friend or colleague? (INT PERC)

19. How often have you correctly anticipated conflict between two acquaintances or work groups? (SYS PERC)

20. Relative to others, how quickly have you spotted a problem brewing in groups and organizations to which you belong? (SYS PERC)

21. How likely have you been to know the best person to complain to when you have a work group or team problem to solve? (SYS PERC)

22. How often have you had a sense of who would fit into your group upon first meeting them? (SYS PERC)

23. How often have you "made light" of a touchy issue when you saw it causing problems in your work group or among friends? (SYS PERC)

24. How much has it bothered you when there were unexpected changes in meetings? (BEH FLEX)

25. How often have you been the person in your family to tell it like it is in order to improve family relationships? (SYS PERC)

26. How easy has it been for you to communicate with others? (SOC COMP)

27. How often do you become annoyed with people who suggest you try something new? (BEH FLEX)

28. How difficult has it been to be polite to people you dislike when meeting in a social situation? (BEH FLEX)

29. How much have you enjoyed working on a variety of different projects? (BEH FLEX)

Table 2 (cont.)

30. How difficult have you found it to work with people who had very different goals and agendas? (BEH FLEX)

31. How often have you been described as fast on your feet? (SOC COMP)

32. How often have you tried to avoid certain kinds of people you just know you wouldn't be able to deal with? (BEH FLEX)

33. To what extent do you become upset by changes in plans, long lines, busy phones etc.? (BEH FLEX)

34. To what extent would your coworkers come to you for advice about what is the appropriate behavior in different work situations? (SYS PERC)

35. How often do you know the right thing to say? (SOC COMP)

36. How often have coworkers asked you for advice on how to talk to another coworker or supervisor? (INT PERC)

37. How often have friends asked you for advice on how to talk to others? (SOC COMP)

38. How often have you been able to tell when someone needed to talk (had something on his or her mind)? (INT PERC)

39. To what extent are you able to size up a person quickly? (INT PERC)

40. How often have you known what to say to get someone back on track when they were upset? (INT PERC)

41. How comfortable are you in a rapidly changing work environment? (BEH FLEX)

Note. All items were answered on 5-point scales.
[a] SYS PERC = System Perception
[b] BEH FLEX = Behavioral Flexibility
[c] INT PERC = Interpersonal Perception
[d] SOC COMP = Social Competence

Soldiers were allowed to voluntarily withdraw from the program if they could not complete the events.

Criteria for inclusion in the assessment program included a required minimum Armed Services Vocational Aptitude Battery General Technical score of 110 or greater for the enlisted soldiers; therefore the sample is somewhat restricted in range for general intelligence.

Measures and Procedures

Soldiers were asked to complete a battery of measures assessing social intelligence. Measures of intelligence and military aptitude for each soldier were taken from existing records. Soldiers provided a ranking of their fellow team members on the criterion of individual effectiveness and leadership. A detailed description of each set of measures follows.

Social Intelligence. Several different assessments of social intelligence were incorporated into the measurement battery. The key instrument was the 34-item background data measure described earlier. As noted, this measure assesses social perceptiveness, both with respect to individuals and aggregations, and behavioral flexibility. Several other measures were included to establish the convergent validity of this scale. One such instrument was the 7-item background data measure of social competence, also described in the previous section. This instrument is based on definitions of social intelligence offered by Ford and Tisak (1986) and Marlowe (1986), who emphasized behavioral competence in social domains; it does not, however, directly measure social perceptiveness and behavioral flexibility, and thus was included to validate these scales.

A second instrument used to establish convergent validity was Lennox and Wolfe's (1984) measure of self-monitoring. Self-monitoring is defined as an ability to be "particularly sensitive to the expression and self-presentation of relevant others in social situations" and to use this information in regulating one's own responses (Synder, 1979, p. 89). Lennox and Wolfe measure self-monitoring skills with two scales, one tapping "sensitivity to the expressive behavior of others", and the other tapping "ability to modify self-presentation."

Finally, two subscales of Guilford's test of social intelligence (Guilford & Hoepfner, 1971; Hoepfner & O'Sullivan, 1968; O'Sullivan & Guilford, 1975a) were included for comparison purposes. Time constraints prevented the inclusion of all six subscales; thus, the two most reliable measures were included in the battery. These were "Cartoon Predictions" and "Social Translations" (Kuder-Richardson reliability estimates reported by Hoepfner & O'Sullivan, 1968 were .79 and .86, respectively). The

first scale required respondents to predict the most appropriate response by a particular actor in cartoon sketches of social situations. The second measure presented a series of statements made by one role player to another (e.g., boss to secretary). Respondents were then asked to choose two different role players who could make the same statement, but have a very different meaning or intention.

Social intelligence measures were administered by one of the authors during the third week of the assessment program. Soldiers were assured both by the company commander and the researcher that the survey data were not part of their Army assessment and were completely confidential. It should be noted that the assessment program was a physically demanding and stressful program, so soldiers taking the survey had been under stress and diminished sleep for two weeks prior to survey administration. Survey administration took approximately one hour.

Academic Intelligence and Aptitude. Soldiers completed the Wonderlic Personnel Test as part of their in-processing for the assessment program. Armed Services Vocational Aptitude Battery (ASVAB) scores were obtained from an Army database, from tests that were administered only to the enlisted soldiers prior to their entry into the Army. Officers do not take the ASVAB.

The Wonderlic assesses general verbal, spatial, and numerical reasoning abilities. The ASVAB measures aptitudes and abilities in several areas related to military functioning (e.g., mechanical comprehension; general science; verbal, math and academic abilities, electronics). These measures can be combined to produce a general technical competence score. Only this general score was used in the present study, along with scores on the Wonderlic, to assess the independence of the proposed social intelligence measure from measures of academic or verbal intelligence, abilities, and aptitudes.

Peer Rankings. Peer ranks were used to establish criterion related validity. At the end of the 5 days of events, each team member was asked to rank all team members, excluding themselves, on the criterion of individual effectiveness in the team. This included both their effectiveness as a team member and their effectiveness during their rotation as the team leader. The ranks for each soldier were then averaged across raters to create an overall rank. Only this final ranking was available for these analyses.

RESULTS AND DISCUSSION

Analyses of the items in the background data social intelligence measure indicated good internal consistencies for each of the subscales. Cronbach's alphas were .72 for the system

perceptiveness items, .82 for the interpersonal perceptiveness items, .76 for the behavioral flexibility items, and .72 for the social competence items. Means and other descriptives for each background item can be seen in Table 3. In general, the size of the standard deviations suggests that there is variance in responses, and the minimum and maximum values show that most items exhibit the full range of values. The means are higher than the midpoint of the scale, and the distributions tend to be negatively skewed, factors which may tend to somewhat attenuate the results.

Scale Distinctiveness

To examine scale distinctiveness, a factor analysis using a principle axis factor extraction with oblique rotation was completed with all 34 items for the social perceptiveness and behavioral flexibility scales. An examination of the preliminary scree plot suggested 3 factors. A second factor analysis was completed on the subscales, constraining the solution to 3 factors. The intercorrelation between the first and second factors was -.10; between the first and third was -.62; and between the second and third was .06.

Table 4 indicates the items with loadings above .40 on the factors. The first factor can be labeled "social perceptiveness." This factor contained the items developed to assess interpersonal and system perceptiveness. The second and third factors contain the items developed to measure behavioral flexibility. This suggests that behavioral flexibility may have two components. Factor 2 can be labeled "social flexibility", referring to the ability to successfully handle multiple types of social demands (e.g., "How comfortable are you in working with different groups having very different goals and agendas"). Factor 3 reflects resistance to change, novelty, or ambiguity in social situations (e.g., "How much has it bothered you when there were unexpected changes in meetings") and can be labeled "defensive rigidity".

The results of this factor analysis suggest, then, that while the proposed background data measure appears to reflect the defined dimensions of social intelligence, perceptions at the individual and system levels reflect similar processes and capabilities. Behavioral flexibility may actually contain two separate components: one concerned with competence across differing social circumstances, the other reflecting personal comfort in the face of change or novelty.

Correlational Validity Evidence

Table 5 indicates the correlations among the measures of social and academic or abstract intelligence. Social perceptiveness (combined interpersonal and system perception) was

Table 3.

Item Level Analyses: Descriptives and Scale Item-Total Correlations

Variable	Mean	Std Dev	Minimum	Maximum	Item-Tot R
Systems Perception					
1	3.66	.81	1	5	.2904
19	3.38	.78	1	5	.4906
23	3.23	.96	1	5	.3318
22	3.77	.72	2	5	.4615
20	3.52	.78	1	5	.5375
34	3.41	.85	1	5	.4711
25	3.41	.97	1	5	.2883
21	3.81	.85	1	5	.3187
15	3.24	.69	2	5	.4453
Interpersonal Perception					
3	3.69	.68	2	5	.4332
6	3.79	.75	2	5	.4026
8	3.95	.55	2	5	.4331
10	3.97	.54	2	5	.4659
11	3.66	.94	1	5	.3557
12	3.43	.98	1	5	.2628
13	3.81	.75	1	5	.3871
14	3.97	.61	2	5	.3749
16	4.03	.55	1	5	.4952
17	3.49	.80	1	5	.5813
18	3.69	.81	1	5	.5361
36	3.38	.90	1	5	.4113
38	3.87	.67	3	5	.4786
39	3.58	.71	2	5	.5316
40	3.70	.67	2	5	.5145
Behavioral Flexibility					
2	3.72	.85	2	5	.5762
5	4.22	.74	2	5	.3850
7	4.16	.56	2	5	.3014
24	3.51	.85	1	5	.3862
27	3.94	.70	2	5	.4238
28	3.80	.89	1	5	.3545
29	4.07	.81	1	5	.4156
30	3.79	.69	2	5	.4395
32	3.23	.83	1	5	.3466
33	3.59	.85	1	5	.4604
41	3.96	.75	2	5	.3707
Behavioral Competence					
4	3.28	.69	1	5	(trial)
9	4.05	.59	2	5	(trial)
35	3.78	.75	2	5	.5347
26	4.19	.86	2	5	.5506
31	3.74	.88	2	5	.4840
37	3.32	.86	1	5	.4544

Table 4.

Item Loadings on Factors (Partialled)

Item Number[a]	Social Percept	Social Flex	Defensive Rigidity
20	.73		
17	.72		
15	.67		
16	.66		
38	.60		
18	.57		
11	.57		
19	.57		
39	.55		
13	.55		
10	.53		
22	.47		
34	.47		
8	.40		
40	.40		
28		.62	
33		.58	
32		.51	
27		.42	
2			-.72
29			-.70
5			-.67
41			-.67
7			-.46
30			-.44
% Common Var	.21	.09	.06

Note. [a] see Table 2 for item wordings

Table 5.

Correlations Among Social and Academic Intelligence Scales

	1	2	3	4	5	6	7	8	9	10	11	12
1. Social Percept.[a]												
2. Interp. Percept.	.95**											
3. System Percept.	.91**	.73**										
4. Behavioral Flex.[b]	.22**	.27**	.12									
5. Social Flexibility	.02	.09	-.07	.80**								
6. Defensive Rigidity	.33**	.35**	.26**	.83**	.34**							
7. Social Competence	.73**	.71**	.63**	.37**	.15*	.45**						
8. Cartoon Pred.	.18*	.14	.20**	.11	.14	.01	.11					
9. Social Trans.	.18*	.11	.24**	-.04	-.06	-.02	.10	.43**				
10. L.W. Sensitivity	.60**	.59**	.51**	.10	.03	.13	.42**	.10	.20**			
11. L.W. Self Pres.	.36**	.34**	.33**	.23*	.09	.29**	.35**	.13	.12	.38**		
12. Wonderlic	.10	-.01	.24*	-.08	-.15	.02	-.05	.45**	.55**	.16	.26**	
13. ASVAB - GT Score	.14	.10	.17*	-.03	-.07	.02	-.03	.26**	.34**	.19*	.15	.57**

Note: * $p<.05$, ** $p<.01$. [a] Social percept. is the combination of the interpersonal and system perceptiveness scales. [b] Behavioral flexibility is the combination of the social flexibility and defensive rigidity scales. Defensive rigidity was coded such that higher scores reflected less rigidity.

most strongly correlated with the background data measure of social competence ($r = .73$, $p<.01$), and the Lennox and Wolfe self-monitoring scales: social sensitivity ($r = .60$, $p<.01$), and self-presentation ($r = .36$, $p<.01$). It was also significantly correlated with both of Guilford's subscales, although these correlations were small in magnitude: cartoon predictions ($r = .18$, $p<.01$), and social translations ($r = .18$, $p<.01$). The correlations of these scales with the interpersonal and system perception scales separated were similar in magnitude, except that interpersonal perception was not significantly correlated with Guilford's measures of social intelligence.

Behavioral flexibility was significantly correlated with social competence ($r = .37$, $p<.01$) and one's ability to modify self-presentation ($r = .23$, $p<.05$). Social flexibility was correlated only with social competence ($r = .15$, $p<.05$), while defensive rigidity was negatively correlated with social competence ($r = -.45$, $p<.01$) and social perceptiveness ($r = -.33$, $p<.01$). When interpersonal and system perceptiveness were used separately, correlations of a similar magnitude were obtained. Taken together, these data suggest good convergent validity for the social perceptiveness scales. The defensive rigidity scale, but not social flexibility, demonstrated a moderate level of convergence with related measures.

The combined social perceptiveness measure and the behavioral flexibility scales were not significantly correlated with either measure of academic intelligence and aptitude. Alone, the system perceptiveness scale, but not interpersonal perceptiveness, was significantly correlated with the Wonderlic ($r = .24$, $p<.05$) and the GT score from the ASVAB ($r = .17$, $p<.05$). Both of the Guilford social intelligence scales had surprisingly robust correlations with the measures of academic intelligence and aptitude, and Lennox and Wolfe's social sensitivity scale was significantly correlated with the ASVAB GT score ($r = .19$, $p<.05$), but not with the Wonderlic. These data suggest that the background data measure of social intelligence and its respective subscales had greater discriminant validity with respect to other measures of intelligence than prior, existing measures. While the ASVAB scores are restricted in range due to the prerequisite requirement, any attenuation of correlations with this variable should be applicable to all of the social intelligence scales tested here.

Factor Analytic Validity Evidence

Evidence for the convergent and discriminant validity of the background data social intelligence measure was also provided by a factor analysis of all of the measures in this study (for this analysis interpersonal and system perceptiveness were not combined into a single scale). The eigenvalues and the scree plot of a principle axis solution factor analysis suggested a

three factor solution. Orthogonal VARIMAX rotation was used because factor intercorrelations were less than .20 (Tabachnick & Fidell, 1989, suggest using .30 as a guideline). The results of this analysis are shown in Table 6.

Factor 1 contains system and interpersonal perceptiveness, social sensitivity, self-presentation skills, and social competence. The second factor contains the Wonderlic, the ASVAB GT score, and Guilford's measures of social intelligence. The third factor includes Guilford's cartoon predictions and behavioral flexibility. The substitution of social flexibility and defensive rigidity for behavioral flexibility in this factor analysis did not significantly change the placement of the other scales on the factors in Table 6. These data further demonstrate that the background data measure of social intelligence is more independent from other forms of intelligence and aptitude then Guilford's measure of social intelligence.

Criterion Validity

Table 7 presents the correlations of social and academic intelligence with peer rankings of effectiveness in a team performance setting. Perceived effectiveness was significantly correlated with social perceptiveness ($r = .17$, $p<.01$), system perceptiveness ($r = .16$, $p<.05$), interpersonal perceptiveness ($r = .15$, $p<.05$), and social competence ($r = .22$, $p<.01$), but not with behavioral flexibility, or its subscales. Peer ratings were not correlated with Guilford's measures of social intelligence, Lennox and Wolfe's self-monitoring indices, Wonderlic scores, or with the ASVAB GT score.

These data suggest that the background data social intelligence measure has stronger criterion validity than pre-existing measures of social perceptiveness. While the overall correlations are modest in magnitude, several factors suggest their attenuation. First, the final sample for this study was soldiers who successfully completed the entire series of ten events. Soldiers who could not finish the exercises had dropped out before peer rankings were completed. Thus, the sample is a restricted one. Second, the tasks were all physical endurance events, so the required behaviors did not vary significantly from event to event (Zaccaro, Zazanis, & Diana, 1993). Accordingly, behavioral flexibility would not necessarily be critical for effectiveness in this setting. Finally, task demands for member interaction and interdependence were moderate. Social intelligence should be more strongly correlated with individual effectiveness in team settings when teams encounter multiple situations with varying demands and social requirements, and when team tasks require high levels of social interaction and interdependence.

Table 6.

Scale Loadings on Factors

Scales	Factor 1	Factor 2	Factor 3
Interp. Percept.	.86		
Social Competence	.79		
System Percept.	.74		
L & W - Sensitivity	.70		
L & W - Self Present.	.36		
Wonderlic		.86	
ASVAB - GT Score		.63	
Social Translations		.62	
Cartoon Predictions		.49	.32
Behavioral Flexibility			.78
Pct. of Variance	.30	.18	.07

Table 7.

Correlations with Peer Rankings

Scales	Correlation with Peer Rankings[a]
Social Perceptiveness[b]	.17*
Interpersonal Perception	.15*
System Perception	.16*
Behavioral Flexibility[c]	.02
Social Flexibility	-.04
Defensive Rigidity	.08
Social Competence	.22*
Social Translations	-.01
Cartoon Predictions	.05
L & W - Self Presentation	.06
L & W - Sensitivity	.04
ASVAB - GT Score	-.03
Wonderlic	.03

Note. * $p<.05$. [a] peer rankings were reversed scored so that 1 = lowest rank, 14 = highest rank. [b] Social perceptiveness is the combination of the interpersonal and system perceptiveness scales. [c] Behavioral flexibility is the combination of the social flexibility and defensive rigidity scales. Defensive rigidity was coded such that higher scores reflected less rigidity.

CONCLUSIONS

The results of this study suggest the following conclusions:

1. the proposed social intelligence measure exhibited acceptable levels of reliability;

2. the proposed measure of social intelligence was not significantly associated with general intelligence or with ASVAB scores. Further, the background data measure demonstrated better discriminant validity with respect to these measures than the other measures of social intelligence;

3. the proposed measure exhibited acceptable levels of convergent validity with other measures of social skills; and,

4. the social perceptiveness subscales of the proposed measure exhibited a small but statistically significant correlation with peer rankings of performance effectiveness in a team setting.

This study should be regarded as only a preliminary psychometric evaluation of the proposed background data measure of social intelligence. The data from this study suggest a promising new instrument for this construct, particularly when contrasted with other existing measures. Before wider use of this instrument can be recommended, research should examine validities using multiple relevant criteria. In addition, while other background measures have demonstrated resistance to faking and response biases as discussed in the introduction, further consideration of these issues is necessary before this measure is used in a selection or classification situation.

References

Abelson, R. (1981). Psychological status of the script concept. American Psychologist, 36, 715-729.

Bass, B. M. (1990). Bass & Stogdill's handbook of leadership: Theory, research, and managerial application (3rd ed.). New York: Free Press.

Bouchard, T. J. (1969). Personality, problem-solving procedure, and performance in small groups. Journal of Applied Psychology Monograph, 53,(1, Pt. 2), 1-29.

Bureau of Public Personnel Administration. (1930). Partially standardized tests of social intelligence. Public Personnel Studies, 8, 73-79.

Busciglio, H. H., King, I. H., & Palmer, D. R. (1991). What is "Social Intelligence" and how do we measure it? Paper presented at the annual meeting of the Military Testing Association, San Antonio, TX.

Cantor, N., & Kihlstrom J. F. (1985). Social intelligence: The cognitive basis of personality. In P. Shaver (Ed.), Review of personality and Social psychology (Vol. 6, pp. 15-33). Beverly Hills: Sage Publications.

Cantor, N., & Kilhstrom, J. F. (1987). Personality and social intelligence. Englewood Cliffs, NJ: Prentice-Hall.

Connelly, M. S., Zaccaro, S. J., & Mumford, M. D. (1992). Evidence for cross-situational leadership. Paper presented at the annual meeting of the American Psychological Association, Washington, DC.

Cronbach, L. J. (1960). Essentials of psychological testing (2nd ed.). New York: Harper & Row.

Fleishman, E. A., & Zaccaro, S. J. (1992). Toward a taxonomy of team performance functions. In R. W. Swezey & E. Salas (Eds.), Teams: Their training and performance. ABLEX: Norwood, NJ.

Ford, M E., & Tisak, M. S. (1983). A further search for social intelligence. Journal of Educational Psychology, 75, 196-206.

Gilbert, J. A., Connelly, M. S., Mumford, M. D., & Zaccaro, S. J. (1992). A background data measure of social intelligence. Fairfax, VA: Center for Behavioral and Cognitive Studies, George Mason University.

Gooding, R. Z., & Wagner, J. A. (1985). A meta-analytic review of the relationship between size and performance: The productivity and efficiency of organizations and their subunits. Administrative Science Quarterly, 30(4), 462-481.

Guilford, J. P., & Hoepfner, R. (1971). The analysis of intelligence. New York: McGraw-Hill.

Hackman, J. R., & Morris, C. G. (1975). Group tasks, group interaction processes, and group performance effectiveness: Advances in experimental social psychology (Vol. 8). New York: Academic Press.

Heslin, R. (1964). Predicting group task effectiveness from member characteristics. Psychological Bulletin, 62(4), 248-256.

Hoepfner, R., & O'Sullivan, M. (1968). Social intelligence and IQ. Educational and Psychological Measurement, 28, 339-344.

Hunt, T. (1928). The measurement of social intelligence. Journal of Applied Psychology, 12, 317-334.

Keating, D. P. (1978). A search for social intelligence. Journal of Educational Psychology, 705(2), 218-223.

Lennox, R. D., & Wolfe, R. N. (1984). Revision of the self-monitoring scale. Journal of Personality and Social Psychology, 46, 1349-1364.

Mann, R. D. (1959). A review of the relationship between personality and performance in small groups. Psychological Bulletin, 56, 241-270.

Marlowe, H. A., Jr. (1986). Social intelligence: Evidence for multidimensionality and construct independence. Journal of Educational Psychology, 78, 52-58.

Marlowe, H. A., & Bedell, J. R. (1982). Social intelligence: Evidence for the independence of the construct. Psychological Bulletin, 51, 461-462.

Moss, F. A. (1931). Preliminary report of a study of social intelligence and executive ability. Public Personnel Studies, 9, 2-9.

Moss, F. A., & Hunt, T. (1927). Are you socially intelligent? Scientific American, 137, 108-110.

Mumford, M. D., O'Connor, J., Clifton, T. C., Connelly, M. S., & Zaccaro, S. J. (1993). Background data constructs as predictors of leadership behavior. Human Performance, 6(2), 151-195.

Mumford, M. D., & Owens, W. A. (1987). Methodology review: Principles, procedures, and findings in the application of background data measures. Applied Psychological Measurement, 11, 1-31.

Mumford, M. D., & Stokes, G. S. (1992). Developmental determinants of individual action: Theory and practice in the application of background data measure. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (2nd ed., Vol. 3). Palo Alto, CA: Consulting Psychologist Press.

Mumford, M. D., Threlfall, K. V., & O'Connor, J. A. (1992). A manual for background data: Development and application. Fairfax, VA: Center for Behavioral and Cognitive Studies, George Mason University.

O'Sullivan, M., & Guilford, J. P. (1975a). Six factors of behavioral cognition: Understanding other people. Journal of Educational Measurement, 12(4), 255-271.

O'Sullivan, M., & Guilford, J. P. (1975b). Six factor tests of social intelligence (behavioral cognition): Manual of instructions and interpretations. Sheridan Psychological Services, Inc.

Shaw, M. E. (1964). Communication networks. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 1, pp. 111-147). New York: Academic Press.

Shaw, M. E. (1981). Group dynamics: The psychology of small group behavior (3rd ed.). New York: McGraw-Hill.

Snyder, M. (1979). Self-monitoring processes. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 12, pp. 86-128). New York: Academic Press.

Stein, S. (1935). A statistical study of the George Washington University Social Intelligence Test and the George Washington University Mental Alertness Test. Unpublished master's thesis, George Washington University, Washington, DC.

Steiner, I. (1972). Group process and productivity. New York: Academic Press.

Tabachnick, B. G., & Fidell, L. S. (1989). Using multivariate statistics (2nd ed.). New York: HarperCollins Publishers.

Thorndike, E. L. (1920). Intelligence and its use. Harper's Magazine, 140, 227-235.

Thorndike, R. L., & Stein, S. (1937). An evaluation of the attempts to measure social intelligence. Psychological Bulletin, 23, 275-285.

Vernon, P. E. (1933). Some characteristics of the good judge of personality. Journal of Social Psychology, 4, 42-57.

Wagner, R. K., & Sternberg, R. J. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. Journal of Personality and Social Psychology, 49, 436-458.

Walker, R. E., & Foley, J. M. (1973). Social intelligence: Its history and measurement. Psychological Reports, 33, 839-864.

Wechsler, D. (1958). The measurement and appraisal of adult intelligence (4th ed.). Baltimore: Williams & Wilkins.

Zaccaro, S. J., Foti, R. J., & Kenny, D. A. (1991a). Self-monitoring and trait-based variance in leadership: An investigation of leader flexibility across multiple group situations. Journal of Applied Psychology, 76, 308-315.

Zaccaro, S. J., Gilbert, J. A., Thor, K. K., & Mumford, M. D. (1991b). Leadership and social intelligence: Linking social perceptiveness and behavioral flexibility to leader effectiveness. Leadership Quarterly, 2, 317-342.

Zaccaro, S. J., Gualtieri, J., Minionis, D. P. (in press). Task cohesion as a facilitator of team decision-making under temporal urgency. Journal of Military Psychology.

Zaccaro, S. J., Zazanis, M., & Diana, M. (1993). Methods for the assessment and evaluation of individual performance in team settings. (Final Rep.). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. Unpublished manuscript.