Social Intelligence:
Assessment and Training

White Paper
August 2016

Human Dimension Capabilities Development Task Force
Capabilities Development Integration Directorate
Mission Command Center of Excellence (MC CoE)

Social Intelligence:
Assessment and Training

August 2016

Primary Author: Joseph Rodman
Major Contributor: William Hardy
Contract Team Lead: Don Kroening

Human Dimension Capabilities Development Task Force (HDCDTF)
Mission Command - Capabilities Development and Integration Directorate (CDID)
806 Harrison Drive Building 470,
Fort Leavenworth, KS 660627-2302
913-684-4521

https://combinedarmscenter.army.mil/sites/hd/HD_Library/HD_Dashboard.aspx
Produced by Booz Allen Hamilton for the United States Army
Contract: W911S0-11-D-0012-0007

Executive Summary

This is the last of three papers that the Human Dimension Capabilities Development Task Force (HDCDTF) will be producing on social intelligence (SI) in 2016. The first paper, published in February 2016, discussed the historical and theoretical development of SI. It sketched an outline of existing research that has attempted to define SI. The paper provided readers with the appropriate context—including important findings, challenges, and limitations that others have revealed and encountered in the scientific and popular literature—to consider as the Army, and particularly its Human Dimension efforts, develops and executes its interest in the concept.

The second paper, published in May 2016, examined how scholars and practitioners from a variety of fields have attempted to distinguish SI from the seemingly similar concept of emotional intelligence (EI). Both concepts have received significant attention from a broad audience, including the Army; however, common conceptualizations of each are often conflated. In order for the Army to approach its interest in SI and EI deliberately and effectively, it is important to discuss how the relationship between SI and EI has been described in the scientific and popular literature. In short, the existing research on the relationship between SI and EI is inconsistent and at times contradictory. This paper addressed these concerns and provided a waypoint from which the Army can expand its interest and understanding of SI and EI and their potential relationship to each other.

The third paper, presented here, investigates methods that the Army might consider implementing or learning from that attempt to (1) assess social intelligence in individuals and (2) develop or improve social intelligence in individuals. Supporting Objective #1.2 ("Social Intelligence") in The *Army Human Dimension Strategy*, which charges the Army to, "Develop trusted Army Professional as effective team members who thrive in complex social environments, adapt to diverse cultures, communicate effectively, and build relationships," provides the catalyst for the series and serves as the ultimate goal of its research.[1]

The US Army's interest in the Human Dimension requires critical consideration of extant research on measuring and developing SI in individuals. While an important takeaway is the lack of any pre-existing, all-in-one programs for measuring or developing SI, a number of key lessons emerge that can benefit the Army's Human Dimension initiative as it continues to investigate and develop efforts to address its interest in SI and prepare for the complex and changing OE of the future.

[1] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win In*

First, the design of SI measures often dictates their utility for a given population or purpose. In this sense, the context of the test questions (socially-specific vs. socially-general, for example) matter greatly, as does its linkage to specific job tasks and organizational outcomes. A test intended for a specific Army leadership cohort looks much different than one intended for all new Army recruits.

Second, SI assessments should reflect the multidimensional nature of SI. Most scholars now agree that SI is a multidimensional construct that consists of cognitive and behavioral components. Adopting or acknowledging a multidimensional definition of SI, which we propose, can partially address this concern. Ideally, a test of SI would consist of multiple subtests to be able to accurately measure both components and thereby create a composite SI factor. As the literature reveals, however, this is a complex endeavor and has so far proved difficult. If a multidimensional measure of SI is impracticable, any test the Army considers ought to be couched in a multidimensional conceptualization or theoretical framework of SI and expressly state which component(s) of SI it is addressing.

Third, the format of the SI measurement test is important. Each format has strengths and weaknesses that need to be acknowledged and accounted for in the test design. multitrait-multimethod (MTMM) designs that incorporate multiple formats to offset potential variance caused by any single format have emerged as promising and scientifically rigorous measures of SI. Furthermore, nonverbal measures are believed to be especially critical to assessing SI so that the construct is not conflated with traditional measures of IQ that rely largely on written questions and answers. A promising development in this regard is the increased use of a variety of more advanced and increasingly more available multimedia platforms that can be cheaply incorporated in the testing process (video and computer simulations, for instance).

Finally, the lack of empirical research supporting any specific measure of SI prevents any similar claims of the effectiveness of SI development programs. Without any meaningful measure of SI, development tools or education programs intended to improve SI will remain problematic. However, the multidimensional approach to SI may facilitate developing components of SI where attempts to develop SI as a whole prove challenging. In this case, the most logical approach to training or developing SI is to target specific interpersonal and intrapersonal skills that are suggested as elements of SI and also considered critical to individual and team success for the Army.

With these observations in mind, as well as the literature reviewed here and in the previous two white papers on SI, the HDCDTF provides the following recommendations to the Army:

(1) Adopt Marlowe's multidimensional conceptualization as the Army's working definition of SI:

The ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding.[2]

(2) Consider revisiting and testing Zaccaro *et al*'s Background Data Measure of Social Intelligence (BDMSI) among Army personnel to determine if it is feasible and effective to possibly expand to broader groups of personnel and integrate in the Army's Human Dimension initiative. Also consider testing, adopting, or amending the following SI measurement tools to satisfy specific or general SI measurement needs in the Army that the BDMSI may not be able to address:

- Tromsø Social Intelligence Scale (TSIS)
- Magdeburg Test of Social Intelligence (MTSI)
- The Interpersonal Perception Task-15 (IPT-15)
- Schneider and Johnson's Social Knowledge Test (SKT)
- Riggio's Social Skills Inventory (SSI)

(3) Integrate UFMCS curriculum and expertise on interpersonal and intrapersonal skills relating to SI (to include, self awareness, reflection, critical thinking, decision support, and empathy) into the testing procedures of the mechanisms above in order to validate the tool and expand its use within the Army. The intent would be to measure an individual's SI (according to the tools cited above) before and after enrollment in relevant UFMCS courses to determine if they had any effect on their SI.

[2] Herbert A. Marlowe, Jr. "Social Intelligence: Evidence for Multidimensionality and Construct Independence," *Journal of Educational Psychology* 78, no. 1 (1986): 52.

Table of Contents

Introduction

The *Human Dimension Strategy* (*HDS*) identifies social intelligence (SI) as a construct that may be leveraged to effectively develop leaders, foster cohesive teams, and optimize human performance as it prepares for the operational environment (OE) of the future.[3] SI provides a framework for understanding human behavior in social contexts. Broadly, SI can be conceived as a combination of social awareness and effective social action necessary to achieve an individually- or organizationally- valued goal in a social setting. The U.S. Army is a dynamic organization, comprised of a diverse population, and faced with complex problems. Understanding and applying lessons from SI research may allow the Army to more effectively develop, manage, and prepare its force for the challenges of the future. Indeed, many of the characteristics of the future OE that the Army has outlined, including "increased velocity and momentum of human interaction" and "operations among populations in cities," might be at least partially addressed through improved SI of its personnel.[4] The complexity of these scenarios and the variety of stakeholders involved require more effective personnel, more effective leaders, and more effective teams. A century of research on SI, particularly its role in individual performance, informs current and future efforts to achieve mission success with the Army's complex social system and with those whom it interacts.

Measuring and training SI in individuals is a key concern of the Army's interest in the SI. These are also primary topics of research and debate in the long history of SI, particularly interest in SI measurement mechanisms. It is logical for the Army to review and identify methods that effectively assess and develop SI in individuals that are appropriate to the Army's needs and interests. This paper will highlight select lessons and insight from the legacy of SI research may ensure that the Army's investment in the construct is sound and defensible, and rooted in the organizational value that SI literature provides. These methods may provide off-the-shelf options that the Army can utilize (or test) among its personnel, to include Soldiers and leaders. Established assessments and development mechanisms may also provide important insight and guidance for the Army if it was to consider developing its own products tailored specifically for the unique missions of its personnel.

This current white paper begins by providing a recommended working definition of SI and then reviews the available literature that addresses assessing and developing SI in individuals. Here, the Human Dimension Capabilities Task Force (HDCDTF) will describe key tools and methods that a variety of scholars and practitioners have developed to measure and train SI (or correlates of SI) in individuals in order to improve personal and organizational outcomes. The intent is to highlight key findings in the literature on SI, including methods to assess SI and considerations for attempting to improve it, that the

[3] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win In A Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 1.
[4] Department of the Army, *The U.S. Army Operating Concept: Win in a Complex World: 2020-2040*, TRADOC Pamphlet 525-3-1, October 31, 2014, 11-12.

Army may either implement outright or use to inform its own efforts as it continues to explore interest in SI.

Significance of Social Intelligence and the Human Dimension

This white paper emerges from the Army Human Dimension's explicit interest in SI as a major component of its strategy to develop "cohesive teams of trusted professionals that improve and thrive in the ambiguity and chaos of 2025."[5] More implicitly, HD and SI reflect the Army's pivot towards achieving a "social edge" among its adversaries, real and potential, in the future OE.[6] Over the coming decades it is likely that the US Army may not be able to retain its current degree of technological and physical advantage.[7] As this superiority diminishes, and as discussed throughout this series of white papers, it will be necessary for the Army to retain a decisive edge in other ways.

The Army recognizes that one such opportunity is to develop more precise and more effective mechanisms to identify, recruit, train, promote, and manage its personnel by leveraging the lessons from research on SI. This paper and preceding papers provide examples of the relevance of existing research to help inform the Human Dimension Capability Needs Assessment (CAN) process and changes in evolving doctrine, training organization, materiel, leadership, personnel, and policy.

SI is one of many efforts over the last century that attempts to account for individual abilities that go above and beyond what traditional intelligence (IQ) measures. Interest in SI focuses on the individual components (abilities, knowledge, skills, for instance) of social interaction that are thought to contribute to individual achievement. Given the success of established measures of cognitive intelligence (IQ, most notably) in predicting certain outcomes of human performance it is logical and valuable for the Army to pursue interest in a similar mediating construct for individual performance, including leadership, that might help it better manage its personnel and prepare for the changing OE of the future. SI and similar concepts that attempt to reveal what IQ cannot is a frontier of cognitive, behavioral, and organizational research that the Army is well reasoned to pursue.

The *HDS* establishes SI as one of the five supporting objectives to its "Agile and Adaptive Leaders" line of effort.[8] Here it charges the HD community to "[d]evelop trusted Army Professionals as effective team members who thrive in complex social environments,

---

[5] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 1.
[6] *Ibid*.
[7] Department of the Army, *The U.S. Army Operating Concept,* 11.
[8] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 8.

adapt to diverse cultures, communicate effectively, and build relationships."[9] The *HDS* is one of the few Army documents that mention SI explicitly. However, as discussed in the previous two papers in this series, the Army has established skills related to SI (and other similar concepts, such as emotional intelligence) in doctrine and other key publications as central to leader effectiveness and Soldier performance and development.[10] The most notable of these is perhaps *ADRP 6-22: Army Leadership*, which outlines the importance of empathy, self-control, emotional factors, balance, stability, and active listening as part of its *Character-Presence-Intellect* model of leadership.[11] Furthermore, human dimension skills, perspective taking, managing one's emotions, emotional awareness, emotional maturity, social competence, and social empathy are similar concepts related to SI that are highlighted throughout other official Army publications.[12] Indeed, it is not anything new that the Army relies on lessons from psychology, cognitive science, social science, business, and elsewhere about the affective and interpersonal components of human facility to inform its efforts and prepare its personnel for a variety of contingencies.

The Army's Human Dimension initiative is unique, however, in that it is rooted in the notion that technology and physical superiority cannot generate knowledge and solve problems in and by themselves. Instead, the Human Dimension effort relies on the notion that the Army's people, and most notably the synergy created through their relationships with one another, are critical components that the Army needs to focus on for generating and processing the right kinds of information needed to solve the complex and rapidly changing problems it faces now and will face in the future. A refined approach to managing the Total Force can propel the Army forward and help it maintain the advantage it currently enjoys in the OE of the future. The Army's Human Dimension initiative has identified SI, including available methods to measure and develop it in individuals, as an important component of this effort.

Review of Social Intelligence

SI has been defined in a number of ways since it was first proposed. The long and unresolved history of SI conceptualizations was reviewed in the previous two white

[9] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 8.
[10] Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative* (Fort Leavenworth, KS: Mission Command Center of Excellence, February 2016): 3.
[11] Department of the Army, *ADRP 6-22: Army Leadership*, August 2012, 1-4 – 1-5.
[12] Such as Department of the Army Pamphlet 600-3: Commissioned Officer Professional Development and Career Management, Field Manual 3-07: Stability, Field Manual 3-24: Counterinsurgency, TRADOC Pamphlet 525-8-5: The U.S. Army Functional Concept for Engagement, TRADOC Pamphlet 525-3-7: The U.S. Army Human Dimension Concept, TRADOC Pamphlet 525-3-1: The U.S. Army Operating Concept: Win in a Complex World: 2020-2040, and the *UFMCS Applied Critical Thinking Handbook* (formerly called the University of Foreign Military and Cultural Studies Red Team Handbook).

papers. While debate continues, what is most critical to take away from that discussion is that most scholars now agree that SI is *multidimensional*.[13] That is, SI is comprised of cognitive elements and behavioral elements. As such, we propose the Army adopt as a working definition Marlowe's multidimensional conceptualization of SI:

> *The ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding.*[14]

This definition reflects the multidimensional nature that most scholars currently agree SI consists of. "Ability to understand…" comprises the cognitive portion, while "…act appropriately…" comprises the behavioral element. Of course, this isn't the definitive articulation of SI; future research and findings will (and should) drive continued debate concerning the precise conceptualization of SI. This definition, however, can provide a common understanding among Army professionals that they can all rely upon when considering or encountering the term "social intelligence." We believe such a standardized reference point of SI is necessary in order to discuss and implement the Army's interest in SI more effectively.

What is also critical to take away from the first two white papers is that SI, EI, and similar concepts have been linked to individual job performance, leadership, and organizational outcomes. Indeed, such alternative intelligences are often touted in existing literature as a critical, untapped element of effective leadership and performance. This comprises the Army's chief concern with SI: how might SI be used to better predict the success and performance of Army personnel?

Despite this interest, and as the previous two white papers on SI have revealed, much of the existing research on SI remains incomplete, inconclusive, and at times contradictory. For instance, while there is evidence to support the notion that SI and EI are linked to leadership and performance many scholars argue that this evidence, as it has been presented thus far, is insufficient to demonstrate a *direct* relationship that proves anything above and beyond what existing measures of IQ and personality already exhibit.[15,16] Furthermore, although research has progressed to generally establish SI's

---

[13] In fact, E.L. Thorndike's original description of social intelligence in 1920 was multidimensional: "the ability to understand and manage men and women… to act wisely in human relations." Later conceptualizations of SI refined (such as Marlowe's definition above) and at times diverged from this original articulation; however, recent research, specifically multitrait-multimethod (MTMM) studies, provides growing evidence of the multidimensional nature of social intelligence. For instance, see: Wong *et al* 1995, Lee *et al* 2000, and Weis and Süß 2007. For a review of these and other MTMM studies of SI please see the first HDCDTF white paper in this series: Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative* (Fort Leavenworth, KS: Mission Command Center of Excellence, September 2015): 20-23.

[14] Herbert A. Marlowe, Jr. "Social Intelligence: Evidence for Multidimensionality and Construct Independence," *Journal of Educational Psychology* 78, no. 1 (1986): 52.

[15] Ronald E. Riggio and Joanne Lee, "Emotional and Interpersonal Competencies and Leader

multidimensional nature, conceptualizing it with any precision and consensus among scholars and practitioners remains problematic.[17] This is both the cause and consequence of the lack of a sound overarching theory of SI and the variety of resulting component lists of what various models of SI contend the construct consists of. In turn, this has made establishing the validity of SI and distinguishing it from academic intelligence *the* crucial issue in the literature. It remains unresolved. Due to SI's conceptual ambiguity, it can often resemble, overlap, and generally be confused and conflated with similar constructs of alternative intelligence and "people skills" such as emotional intelligence, practical intelligence, social skills, and so forth. There has been some research attempting to establish the relationship among these seemingly similar concepts (most notably its relationship to emotional intelligence), but, again, the lack of clear overarching theories for any of these concepts, including SI, precludes many meaningful conclusions.[18]

The shortcomings in the SI literature touched upon here and detailed at length in the previous white papers are not meant to discourage interest in the concept. Rather, the reviews are intended to provide as comprehensive and objective an overview as possible of the key issues, including the limitations, concerning SI. These products should serve to better inform the Army as it explores methods to refine its approach to managing its personnel. Indeed, the social component of the Army—particularly compared to the technological or physical side—remains relatively unexploited. Existing IQ and personality constructs and measurements account for a significant portion of the human dimension. As a result, the *Human Dimension Strategy*[19] and the *US Army Operating Concept*[20] both acknowledge that the Army must change how it recruits, trains, educates, and manages its Soldiers, leaders, and civilians. SI may be able to address, in part, some of the potential and performance that is unaccounted for in existing cognitive and personality constructs and measures. It is therefore essential that the Army understand the spectrum of findings available and established on SI.

Critical elements of interest in SI and of particular concern for the Army are how to measure it and then how to develop or train it in individuals. Similar to existing literature on SI's conceptualization and its relationship to emotional intelligence, there are limitations and contradictions regarding how best to measure and develop it. The remaining portion of this paper will review the existing research on proposed methods

---

Development," *Human Resource Management Review* 17 (2007): 422.

[16] Frank J. Landy, "Some Historical and Scientific Issues Related to Research on Emotional Intelligence," *Journal of Organizational Behavior* 26 (2005): 420.

[17] Sun-Mee Kang, Jeanne D. Day, and Naomi M. Meara, "Social and Emotional Intelligence: Starting a Conversation about Their Similarities and Differences," In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts (Cambridge, MA: Hogrefe and Huber Publishers, 2005): 93.

[18] Kang *et al*., "Social and Emotional Intelligence," 98.

[19] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 1.

[20] Department of the Army, *The U.S. Army Operating Concept,* 39.

do so with the intent of identifying existing off-the-shelf tools that the Army can either use directly or learn from in order to develop their own. As with definitions of SI, there are no perfect answers to this issue. Each method has virtues and limitations; we will attempt to explain them each in turn. The majority of the paper will consider SI measurement methods. Notably, there is limited empirical research on SI development programs (largely due to the lack of any agreed upon definition of SI, which is the key to advancing any development program). As such, there will be a brief discussion at the end of the paper discussing a number of important considerations regarding how to conceptualize and approach improving SI in individuals.

Social Intelligence Measurement Taxonomy

One way to help think about the variety of historic and contemporary SI measurement tools is by considering two broad taxonomic systems for each. This creates a kind of cross-classification of SI measurement tools that can help place each tool into different bins to more easily understand how they are designed and what benefits and limitations they each may have.

One feature of the tools is their *method* or *format*. This has been discussed indirectly in other segments of the current series on SI;[21] most often, the HDCDTF white papers have discussed measurement formats when outlining the limitations of self-report studies. When an assessment design uses two different methods to measure SI it is called a "multimethod" study. This helps to account for variance in the results of the test that may be caused by any individual format.

The other feature of SI measurement tools that is important to consider is the specific dimension of SI that the mechanism purports to measure. As discussed previously, most contemporary psychometric conceptualizations of SI contend that the construct is *multidimensional,* consisting of both a cognitive (ability) component and a behavioral (affective action) component.[22] A single test or measure is, as far as has been developed thus far, able to account for only one of these dimensions of SI. When a SI assessment tool consists of a battery of subtests that attempt to measure both of these dimensions (one at a time) in a broader measurement framework it is referred to as a "multitrait" test. When a multitrait test is combined with a multimethod format it is called a

[21] Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*: 20-22.

[22] It is important to note that these categories are appropriate for psychometric conceptualizations of SI not personality conceptualizations of SI, which are fundamentally different. For a more a brief overview of the personality approach to SI see the first paper Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*: 24; for a more detailed discussion of the personality perspective of SI see: John F. Kihlstrom and Nancy Cantor, "Social Intelligence," in *Handbook of Intelligence*, edited by Robert J. Sternberg (New York, NY: Cambridge University Press, 2000): 368-374.

"multitrait-multimethod" (MTMM) study. MTMM approaches to SI measurement over the last few decades have attracted considerable scholarly interest and are now widely considered the most promising method of SI assessment. The two figures below (Figure 1 and Figure 2) describe each of the categories.

Method	Description
Self-report	• Presents respondents with descriptive statements and asks them to rate themselves to the extent to which they agree or disagree with the respective statements. • Common because they are cheap and easy to administer to large groups of people. • Historically, the most popular method of SI assessment. • Susceptible to faking and inflation. • Usually a measure of *typical* social performance.
Other-report	• Presents knowledgeable persons (peers, supervisors, teachers, parents, friends) with descriptive statements and asks them to rate the subject of the test on the extent to which they agree or disagree with the respective statements. • Believed to be more reliable than self-reports due to lack of incentive to fake or inflate responses. • Also important to SI in that they have an inherently interpersonal component to them. • Usually a measure of *typical* social performance.
Performance -based	• Usually a measure of *maximal* performance. • Present people with social-based problems to solve. • For instance, the test-taker is presented with a picture of a social dilemma and is asked to describe or choose how to best resolve the situation. • The Six and Four Factor Tests of SI described above are performance-based tests of SI. • Important to note that *knowledge* about social problems is different than *skill* regarding social problems.
Interviews	• Popular in assessments of social skills, including social intelligence. • Can be used to assess a wide variety of skills and constructs. • Often implemented for job-based assessments, in which test-takers are asked to describe ideal social behavior for a variety of situations.
Situational Judgment Test (SJT)	• Presents respondents with job-related situations and sets of alternate courses of action to the situations. Respondents then choose either the best or worst of these courses of action or rate each of them in terms of their effectiveness. • Intended to provide a more contextualized method for assessing SI. • Possible to integrate a variety of mediums (video, computer simulations, etc.) to facilitate the scenarios and to make them more realistic. • The Judgment in Social Situations subtest of the GWSIT can be considered an early SJT. • Inherently multidimensional because they are able to refer to a range of situations, which actually makes it more difficult to accurately identify what they assess.
Assessment Center Exercises (AC)	• Places respondents in simulated situations. • Experts or proctors observe their behavior. • Observers then make inferences about their abilities based on their performance. • Popular in industrial and organizational psychology. • Like SJTs, ACs contextualize the exercise which is important to SI. • Intended to more accurately reflect the responses or behaviors of people in the real world. • Include role-plays and case scenarios. • Poor convergent validity with other measures of SI. • Expensive and laborious.

Figure 1. Taxonomy of social intelligence methodologies.[23]

[23] Filip Lievens and David Chan, "Practical Intelligence, Emotional Intelligence, and Social Intelligence," in *Handbook of Employee Selection*, edited by J.L. Farr, N.T. Tippins, L. Jones, and T. Nancy (New York: Lawrence Erlbaum/Taylor & Francis, 2010): 344-349.

Measurement dimension	Description
Cognitive	• Social perception or the ability to understand or decode verbal and nonverbal behaviors of others.[24] • Verbal measures of cognitive SI tend to overlap with academic intelligence, though there are exceptions. As such, nonverbal measures of cognitive SI are generally more successful in contributing to identifying a conceptually coherent domain of SI.[25,26] • Usually more accurate in predicting or accounting for generalized social abilities. • Usually concerned with *maximal* individual performance (potential-based). • Can generally be developed over time through training, education, or experience.
Behavioral	• Effectiveness in social situations. • Reliant less on cognition than on intentions, motivations, personality traits, values, and norms, which are much more difficult to measure etc.[27] • Usually more accurate in predicting or accounting for SI in more specific situations with discrete demands.[28] • Usually concerned with *typical* individual performance (results-oriented). • Relatively stable and difficult to develop over time.

Figure 2. SI measurement dimensions.[29]

Historical Social Intelligence Measurement Tools

A number of key historical tools are described below that demonstrate the variety and evolution, as well as challenges and shortcomings, of attempts to measure and assess SI. An overview of more sophisticated contemporary tools that have built upon these historic tools will follow the historical review. The contemporary tools described at the end of this section are those that the Army should consider using or learning from in order to develop their own and begin addressing their key concerns regarding SI and the Human Dimension (notably, developing "trusted Army Professional as effective team member…").[30]

Attempts to measure individual differences in social abilities have accompanied interest in SI since it was first proposed in 1920.[31] These measurement efforts have largely taken the *psychometric* view of SI, which conceives it as "a separate set of primary mental

[24] Lievens and Chan, "Practical Intelligence, Emotional Intelligence, and Social Intelligence," 343.
[25] Susanne Weis and Heinz-Martin Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts (Cambridge, MA: Hogrefe & Huber Publishers, 2005): 209.
[26] Jennifer Hedlund and Robert J. Sternberg, "Too Many Intelligences? Integrating Social, Emotional, and Practical Intelligence," in *The Handbook of Emotional Intelligence: Theory, Development, Assessment, and Application at Home, School, and in the Workplace*, edited by Reuven Bar-On and James D.A. Parker (San Francisco: Jossey-Bass, 2000): 139.
[27] Kristin Conzelmann, Susanne Weis, and Heinz-Martin Süß, "New Findings About Social Intelligence: Development and Application of the Magdeburg Test of Social Intelligence," *Journal of Individual Differences 34*, No. 3 (2013): 119.
[28] Susanne Weis, "Theory and Measurement of Social Intelligence as a Cognitive Performance Construct," (Doctoral dissertation, Universität Magdeburg, January 21, 2008), 16.
[29] Adapted from Weis and Süß, "Social Intelligence," 207.
[30] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 8.
[31] Weis and Süß, "Social Intelligence," 204-206.

abilities to be contrasted with academic or formal intelligence."[32,33] The intent of these psychometric tools is not just to reflect some *a priori* definition of SI, but to demonstrate its distinctiveness from academic intelligence and existing conceptualizations of personality. Some scholars argue that human social abilities are dependent on an infinite number of social contexts and therefore too complex to be bracketed by a single value on a scale and ranked against other individuals.[34,35,36] Put more simply, there are myriad ways to be socially intelligent and it may undermine the value of these complex and nuanced skills by attempting to develop universal scores of human social ability.[37] Thorndike recognized this possibility in his initial discussion of SI when he observed, "…convenient tests of social intelligence are hard to devise…"[38]

Despite these challenges, researchers and laypeople alike intuitively believe that SI consists of abilities that are likely related to but also distinguishable from academic intelligence.[39] Since SI was first proposed this belief has prodded scholars to attempt to solve these measurement problems in order to uncover possible correlations between conceptualizations of SI and performance and leadership, while also distinguishing it from academic intelligence and personality.[40] Over the years, however, these failures served for many not to close the door on SI research and deny its validity but rather as an opportunity to develop and refine ever more sophisticated efforts to accurately assess it.

---

[32] Nancy Cantor and John F. Kihlstrom, *Personality and Social Intelligence* (Englewood Cliffs, NJ: Prentice-Hall, 1987): 66.

[33] The psychometric approach to SI contrasts the personality approach. For a more in-depth discussion of both of these, please see: Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative,* 24.

[34] Cantor and Kihlstrom, *Personality and Social Intelligence*, 70.

[35] Nancy Cantor and John F. Kihlstrom, "Social Intelligence: The Cognitive Basis of Personality," in *Self, Situations, and Social Behavior: Review of Personality and Social Psychology*, edited by Phillip Shaver (Beverly Hills, CA: Sage Publications, 1985): 28.

[36] Ronald E. Riggio, "Assessment of Basic Social Skills," *Journal of Personality and Social Psychology* 15, no. 3 (1986): 649.

[37] Martin E. Ford and Marie S. Tisak, "A Further Search for Social Intelligence," *Journal of Educational Psychology* 75, no. 2 (1983): 204.

[38] Edward L. Thorndike, "Intelligence and Its Use," *Harpers Magazine* 140 (1920): 231.

[39] Sun-Mee Kang, Jeanne D. Day, and Naomi M. Meara, "Social and Emotional Intelligence: Starting a Conversation about Their Similarities and Differences," in *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts (Cambridge, MA: Hogrefe and Huber Publishers, 2005): 94.

[40] Timothy A. Judge, Amy E. Colbert, and Remus Ilies, "Intelligence and Leadership: A Quantitative Review and Test of Theoretical Propositions" *Journal of Applied Psychology* 89, no. 3 (June 2004): 549.

The George Washington Social Intelligence Test

One of the first measures of SI developed by serious scholars is the George Washington Social Intelligence (GWSIT).[41,42,43,44] The GWSIT was first developed in 1928 at its namesake university and was based on Thorndike's original, multidimensional suggestion of SI ("…the ability to understand and manage men and women… to act wisely in human relations…").[45,46] It was later revised in 1949 and again in 1955.[47,48] The GWSIT was the most widely used early test of SI from the late 1920s up until the 1960s.[49] In his overview of early SI research, Landy found that between 1920 and 1937 there were ten published studies on SI and seven of them examined or used the GWSIT.[50] Furthermore, the GWSIT's publication in the *Journal of Applied Psychology* was something of a milestone in that it became the first mechanism developed and made available that purported to measure SI.[51]

The original version of the GWSIT was made up of six parts or subtests: (1) judgment in social situations, (2) memory for names and faces, (3) recognition of mental states from facial expression, (4) observation of human behavior, (5) social information, and (6) recognition of mental states behind words.[52] These were condensed to five scales in later revisions of the test as the authors attempted to make the test simpler and quicker to administer. In this later edition, the "facial expression" and "social information" portions were dropped and the "sense of humor" subtest was added.[53,54] These are detailed in the table below (Figure 3). The authors validated the test among students and professionals based on the GWSIT's correlation to occupational status,

---

[41] Frank J. Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence: A Cautionary Tale," in *A Critique of Emotional Intelligence: What Are the Problems and How Can They Be Fixed?*, edited by Kevin R. Murphy (Mahwah, NJ: Lawrence Erlbaum Associates Publishers, 2006): 93

[42] Hedlund and Sternberg, "Too Many Intelligences?" 139.

[43] Susanne Weis and Heinz-Martin Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts (Cambridge, MA: Hogrefe & Huber Publishers, 2005): 207.

[44] Ronald E. Walker and Jeanne M. Foley, "Social Intelligence: Its History and Measurement," *Psychological Reports* 33, Monograph Supplement 1-V33 (1973): 842.

[45] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 207.

[46] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence: A Cautionary Tale," 93.

[47] Walker and Foley, "Social Intelligence," 842.

[48] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence: A Cautionary Tale," 94.

[49] Martee B. Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," (Master's thesis, University of Illinois at Urbana-Champagne, 2010), 15.

[50] Frank J. Landy, "Some Historical and Scientific Issues Related to Research on Emotional Intelligence," *Journal of Organizational Behavior* 26 (2005): 416.

[51] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence: A Cautionary Tale," 93.

[52] *Ibid*.

[53] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 207.

[54] John F. Kihlstrom and Nancy Cantor, "Social Intelligence," in *Handbook of Intelligence*, edited by Robert J. Sternberg (New York, NY: Cambridge University Press, 2000): 360.

extracurricular activity participation, and supervisors' ratings of employees' ability to get along with others.[55]

Subtest Title	Description
Judgment in social situations	Find possible solutions to common social problems.
Memory of names and faces	Memorize names and faces and then match them among a larger selection of photos after an interval of time has passed.
Observation of human behavior	True/false test about human behavior.
Recognition of mental states behind words	Recognize emotions based on a given written or spoken statement.
Social information	True/false test about social information.
Recognition of mental states from facial expressions	Recognize emotions of others based on photographs.
Sense of humor	Select the best ending to a joke.

Figure 3. Subtests of the George Washington Social Intelligence Test.[56]

Almost immediately after the GWSIT was published, however, other scholars consistently demonstrated that the GWSIT correlated highly with academic intelligence. Weis and Süß explain that individual success on the GWSIT "appears to be less dependent on socially intelligent behavior and more on understanding the importance of certain social milieu."[57] Perhaps most damning of all, E.L. Thorndike's son, R.L. Thorndike, performed a series of tests among 500 students (at George Washington University, no less) that found the GWSIT primarily measured verbal ability, which correlated strongly to tests of academic intelligence. In a follow-on study R.L. Thorndike and his co-author concluded by stating that "it seems doubtful that any test which is predominantly verbal can measure social ability."[58] As R.L. Thorndike suggests, the GWSIT's resemblance to academic intelligence can at least be partially attributed to its paper-and-pencil format that relies heavily on verbal skills to address abstracted social contexts. The format taps into many of the same or related cognitive abilities that dictate IQ and relies, as Weis and Süß point out, on specific social knowledge rather than some distinct mental ability linked to social functioning.[59]

Despite these limitations, the GWSIT remained the most well-known measure of IQ well into the 1960s. While the GWSIT as a whole has been largely discarded, portions of it have been used in contemporary MTMM tests of SI. For instance, Lee *et al*'s study on the crystallized and fluid characteristics of SI relied on the GWSIT's "judgment in social

[55] Kihlstrom and Cantor, "Social Intelligence," 360.
[56] Adapted from Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 93, and Weis and Süß, "Social Intelligence," 207.
[57] In other conceptualizations of SI, this is sometimes labeled "social knowledge".
[58] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 93.
[59] Weis and Süß, "Reviving the Search for Social Intelligence," 4.

situations" subtest to measure what they termed "social inference,"[60] while Wong *et al*'s study of SI in college students used the GWSIT's "recognition of the mental states behind words" subtest to account for what they labeled "social perception."[61]

The Chapin Social Insight Test

The University of Minnesota sociologist F. Stuart Chapin was a critical figure in the flurry of mid-century scholarly interest in SI.[62,63,64] He worked with the GWSIT soon after it was made available and accepted it as a generally viable measure of SI.[65] However, he believed that the test focused only on the cognitive measures of SI.[66] In response, he developed the Social Participation Scale in 1939, which was intended to account for individual differences in social action. [67] It was meant as a supplement to the GWSIT.[68] This test received little serious academic attention at the time, but in 1942 Chapin developed and published its counterpart, The Chapin Social Insight Test (CSIT), which was intended to measure the *social understanding* component of SI. Chapin never intended the CSIT to be a comprehensive test of SI, but rather a measure of only a portion of it: what he called "social insight" (corresponding to the cognitive or perceptual dimension of multidimensional theories of SI). In this sense, the CSIT takes on a uni-dimensional, individual differences perspective of SI.[69] Like its predecessor, the CSIT was little noticed upon initial release. In their excellent review of SI through 1973, Walker and Foley surmise that this may have been due to the CSIT's publication in a sociology journal (the *American Sociological Review*) at a time when psychologists made up the vast majority of scholars interested in SI.[70] Gough revived interest in the CSIT in the 1960s when he developed a technical manual to accompany the original CSIT and published a number of studies testing and discussing its validity.[71,72]

---

[60] Jong-Eun Lee, Chau-Ming T. Wong, Jeanne D. Day, Scott E. Maxwell, Pamela Thorp, "Social and Academic Intelligences: A Multitrait-Multimethod Study of their Crystallized and Fluid Characteristics," *Personality and Individual Differences* 29 (2000): 542.

[61] Chau-Ming T. Wong, Jeanne D. Day, Scott E. Maxwell, and Naomi M. Meara, "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," *Journal of Educational Psychology* 87, no. 1 (1995): 119.

[62] Riggio and Lee, "Emotional and Interpersonal Competencies and Leader Development," 423.

[63] F. Stuart Chapin, "Preliminary Standardization of a Social Insight Scale," *American Sociological Review* 7, No.2 (1942): 214.

[64] An overview of the mid-century interest in SI is discussed in Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*.

[65] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 96-97.

[66] Walker and Foley, "Social Intelligence," 849.

[67] *Ibid*.

[68] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 96-97.

[69] Robert J. Schneider and Jeff W. Johnson, *Direct and Indirect Predictors of Social Competence in United States Army Junior Commissioned Officers*, Technical Report 1171, United States Army Research Institute for the Behavioral and Social Sciences, November 2005: 5-6.

[70] Walker and Foley, "Social Intelligence," 849.

[71] Hedlund and Sternberg, "Too Many Intelligences? Integrating Social, Emotional, and Practical Intelligence," 140.

The CSIT consists of 25 items in a paper-and-pencil format.[73] Each item consists of a description of people in a variety of social circumstances. The test-taker is presented with one of these scenarios and then asked to choose among four possible responses the one they believe best explains or resolves the situation.[74] An example of one of these scenarios in the CSIT is presented in Figure 4. Chapin states that the intent of the test is to assess "the ability to evaluate others, to foretell what may occur in interpersonal and social situations, and the ability to rectify disturbing tensions or conflicts."[75] One study determined that the CSIT takes approximately 13 minutes to complete.[76]

Scenario	Available responses
During a conference, the discussion becomes so argumentative and heated that everyone seems to be angry at someone else. Finally, one member who seems to be getting the worst of the argument angrily stalks out. The chairman of the group should then:	a. Immediately declare the meeting adjourned. b. Send someone to ask the departed member to return. c. Ask for a vote whether the meeting should be adjourned. d. Ignore the departure and continue with the order of business remaining.

Figure 4. An example of one of the 25 items on the CSIT.[77]

Like the GWSIT, the CSIT correlated well with social behavior and the results were found to be reliable (consistent).[78,79,80] In his study of the CSIT, Gough found that it correlated highly with a test on human survival, which itself included measures of social judgment and social insightfulness.[81] Walker and Foley point out that measures of social insight on the CSIT related well to occupational status and leadership.[82] Despite these positive developments, however, the CSIT suffers from the same problems as the GWSIT: namely, high correlations to IQ (poor discriminant validity) and low correlations to other measures of SI (poor convergent validity).[83,84,85,86] It is important to note, though, that

[72] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 109.
[73] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 19.
[74] Daniel P. Keating, "A Search for Social Intelligence," *Journal of Educational Psychology* 70, No. 2 (1978): 219.
[75] Weis and Süß, "Reviving the Search for Social Intelligence,"6.
[76] Kimberly Anne Barchard, "Emotional and Social Intelligence: Examining Its Place in the Nomological Network," (Doctoral dissertation, The University of British Columbia, August 2001): 190.
[77] Chapin, "Preliminary Standardization of a Social Insight Scale," 224.
[78] Wong *et al*., "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," 117.
[79] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 19.
[80] Walker and Foley, "Social Intelligence," 849.
[81] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 19.
[82] Walker and Foley, "Social Intelligence," 849.
[83] Lee *et al*., "Social and Academic Intelligences," 540.

while still significant the CSIT's correlation to IQ is less than GWSIT's correlation; this marks some progress though not enough to establish SI's construct validity.[87] Like the GWSIT, at least some of the CSIT's shortcomings in this regard can be attributed to the format of the test (self-report, paper-and-pencil), which relies ("loads") heavily on traditional and familiar cognitive functions.[88]

Furthermore, Weis and Süß argue that the CSIT fails as a measurement because its authors did not contextualize it in a broader higher-order theoretical framework of SI and specify exactly what the tool was assessing within this framework (simply defining "social insight" is not sufficient).[89] While not a viable comprehensive test of SI, the CSIT is still used, like the GWSIT, as an element of broader MTMM studies of SI. For instance, Weis and Süß used the CSIT as a measure of social understanding in their measure of SI, which included social memory and social knowledge components in addition to social understanding.[90] Keating used the CSIT as one of three indicators of written language SI to compare alongside three measures of IQ (incidentally, he found no evidence of SI's construct validity with any of the measures he examined).[91] While falling short of establishing SI's distinctiveness, the CSIT represented an effort to separate the cognitive elements of SI from its behavioral elements and thereby acknowledge the multidimensional nature of the construct.

Six Factor and Four Factor Tests of Social Intelligence

Around the same time that Gough reintroduced Chapin's Social Intelligence Test, Guilford's team developed the Six Factor Tests of Social Intelligence. The tests, which were first published in 1966 and revised to the Four Factor Tests 10 years later, were rooted in Guilford's "Structure of Intellect" model of human intelligence.[92] This was one of the first attempts to comprehensively theorize social intelligence and then develop a measure based on that theory—most prior measurements and conceptualizations of social intelligence had been largely atheoretical. Guilford's Structure of Intellect model was described in the first white paper in this series.[93] In short, Guilford believed that human intelligence was profoundly complex. Within his framework, he and his team identified 150 components of human mental ability.[94] Among these, 30 were directly

---

[84] Wong *et al*., "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," 117.
[85] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 19.
[86] Walker and Foley, "Social Intelligence," 849.
[87] *Ibid*.
[88] Conzelmann *et al*., "New Findings About Social Intelligence," 119.
[89] Weis and Süß, "Reviving the Search for Social Intelligence," 4.
[90] *Ibid*., 6.
[91] Weis, "Theory and Measurement of Social Intelligence as a Cognitive Performance Construct," 105.
[92] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 207.
[93] Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*: 13-14.
[94] Robert J. Sternberg, "A Broad View of Intelligence: The Theory of Successful Intelligence," *Consulting*

related to social intelligence.[95,96,97] He believed that SI was not a unitary structure, but rather that there were many different ways of being socially intelligent and many different types of social intelligence (presaging Ford and Tisak's argument some 15 years later).[98,99] Although it is flawed, the Structure of Intellect model remains the most comprehensive and detailed theoretical framework of SI available.

Relying on earlier suggestions that tests of SI should be evaluated by nonverbal measures, Guilford *et al* designed the Six Factor Tests of SI to include a preponderance of pictorial questions and scenarios.[100] In addition to the sheer amount of labor that went into developing and identifying the 150 components of the Structure of Intellect model, the Six Factor Tests of SI is notable in that it is predicated on a coherent theory of social intelligence and relies heavily on nonverbal measures instead of verbal measures, which often conflate with measures of formal academic intelligence. Furthermore, while Guilford acknowledged the multidimensional nature of SI he also acknowledged that his tests measured cognitive ability only and had no component to measure behavioral action.[101,102,103]

As its name suggest, the original version of the test included six subtests. These were labeled: (1) expression grouping, (2) missing cartoons, (3) social translations, (4) cartoon predictions, (5) missing pictures, and (6) picture exchange.[104] All but one of these subtests is nonverbal. The rest of them rely on photographs, cartoons, and recordings in order to avoid interference with verbal abilities in their assessment.[105] As mentioned above, the test was marketed as a cognitive ability measure (as opposed to a behavioral measure) of SI. Figure 5 describes each of the six subtests. Over time, the measure was whittled down to the four most successful of these subtests: expression grouping, missing cartoons, social translations, and cartoon predictions.[106] Zaccaro *et al* argue that the cartoon predictions and social translations subtests are the two most reliable and consistent of these subscales.[107]

Pyschology Journal: Practice and Research (Summer 2003): 142.
[95] Ford and Tisak, "A Further Search for Social Intelligence," 196.
[96] Kihlstrom and Cantor, "Social Intelligence," 361.
[97] Matthews *et al.*, "Appendix A: A Review and Critique of Social Intelligence," 552.
[98] Ford and Tisak, "A Further Search for Social Intelligence," 204.
[99] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 106.
[100] Walker and Foley, "Social Intelligence," 854.
[101] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 106.
[102] Walker and Foley, "Social Intelligence," 855.
[103] Weis, "Theory and Measurement of Social Intelligence as a Cognitive Performance Construct," 207.
[104] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 207.
[105] Stephen J. Zaccaro, Janelle A. Gilbert, Michelle M. Zazanis, and Marisa Diana, *Investigating a Background Data Measure of Social Intelligence*, Technical Report 1024, United States Army Research Institute for the Behavioral and Social Sciences, March 1995, 7.
[106] Barchard, "Emotional and Social Intelligence," 190.
[107] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, vii.

Subtest	Description
Expression grouping	• Each item in this test consists of a group of three drawings that depicts facial expressions, hand gestures, or body postures that show some thought, feeling, or intention. The task is to select one of four alternative drawings of expressions that belong with the given group of expressions. • This test measures the ability to see similarity of behavioral information in different expressional modes.
Missing cartoons	• Each item presents a series of four cartoons that tells a story. One of these cartoons is missing, and must be selected from among a set of four alternatives. • This test measures understanding of behavior relationships by interpreting the interaction of individuals.
Social translations	• This is the one subtest that uses printed words only. • The subject is given a verbal statement that is exchanged between two people. The subject must then choose one of three alternative pairs of people between whom the same verbal statement would have a different meaning. • This test measures the ability to recognize changes in behavioral meaning based on context.
Cartoon predictions	• The task is to choose one of three alternative cartoons to show what is most likely to happen next. The cartoons show a variety of interpersonal situations. • This test measures the ability to draw implications or make predictions about what will happen following a given social situation; it tests an individual's ability to predict the consequence of behaviors.
Missing pictures	• This test consists of a set of photographs of college students enacting a sequence of events. • The task is to choose the correct picture that properly completes the sequence. • This subscale was part of the original Six Factor Tests but removed from the later Four Factor Tests.
Picture exchange	• The task is to choose a photograph and substitute it for a marked alternative in a set of four so that the chosen photograph logically changes the story's meaning. • The test measures the ability to flexibility interpret a situation, in contrast to rigidly doing so. • This subscale was part of the original Six Factor Tests but removed from the later Four Factor Tests.

Figure 5. Description of subtests of Guilford's Six Factor Tests of Social Intelligence.[108]

The Six Factor Tests of SI received wide interest and in some ways helped revive interest in SI that was sustained into the 1970s and 1980s.[109,110] Guilford's team went to great lengths to establish the construct validity of SI by demonstrating that the Six Factor Tests could predict the SI abilities described in the Structure of Intellect model.[111] As part of these efforts, they found that the test had no correlation with general IQ.[112] However, these circumstances turned out to have been created in something of a vacuum as other studies revealed more skeptical results. While results were mixed, most suggest that the Six Factor Tests of SI are at least modestly, but still statistically significantly, correlated to IQ.[113,114,115,116,117,118] A notable exception to this is a study by

[108] Adapted from: Walker and Foley, "Social Intelligence," 855; Barchard, "Emotional and Social Intelligence," 61.
[109] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 206.
[110] Walker and Foley, "Social Intelligence," 854.
[111] Kihlstrom and Cantor "Social Intelligence," 362.
[112] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," 208.
[113] Schneider and Johnson, *Direct and Indirect Predictors of Social Competence in United States Army Junior Commissioned Officers*, 212.
[114] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 15.
[115] Hedlund and Sternberg, "Too Many Intelligences? Integrating Social, Emotional, and Practical Intelligence," 140.
[116] Karen Jones and Jeanne D. Day, "Discrimination of Two Aspects of Cognitive-Social Intelligence from Academic Intelligence," Journal of Educational Psychology 89, No. 3 (1997): 489.
[117] Luke A. Shanley, Ronald E. Walker, and Jeanne M. Foley, "Social Intelligence: A Concept in Search of Data," Psychological Reports 29 (1971): 1130.

Walker and Foley, who more optimistically found that the Six Factor Tests of SI were "relatively independent" of IQ.[119] To be clear, it is critical that any test of SI demonstrate acceptable discriminant validity from IQ so that its results are not confused with academic intelligence. The results discussed here indicate that the Six and Four Factor Tests of SI do not satisfy this requirement.

The test is notable for its rigorous development and attention to theoretical integration, something that had largely been ignored up until then and has been all-too-often neglected since. As with the previous measures described here, subsequent MTMM designs of SI incorporated elements of the Six Factor Tests of SI. For instance, Zaccaro *et al* used "cartoon predictions" and "social translations" to inform his measure of SI. Wong *et al*[120] and Jones and Day[121] both used the "expression grouping" for their measure of nonverbal SI and pictorial crystallized intelligence, respectively, while Lee *et al*[122] used "cartoon predictions" for their measure of social inference. The continued use of various elements of the Six Factor Tests of SI credits its robust design, particularly its use of nonverbal scenarios; however, the test suffers from the same fundamental problems as previous tests in that scholars have been unable to use it to prove the validity of SI above and beyond existing measures of academic intelligence and personality traits.

Other Measures

The three early measures described in the pages above represent critical landmarks in SI research and measurement, despite their ultimate shortcomings. They highlight a few of the past attempts to measure SI since Thorndike first proposed the notion in 1920. Several of these other examples, like *The Ability to Sell Test*,[123] purported to measure SI in its entirety, while most, like *The Dymond Ratings Test*,[124] *The Vineland Social Maturity Scale*,[125] *Gough's Social Maturity Index*,[126] and the *Gilliland Measure of Sociability*,[127]measure either vague, atheoretical analogues of SI, like social competence or social functioning, or more discrete components of SI found in broader conceptualizations, such as empathy and likeability. Most suffer from some combination

---

[118] Wong *et al*., "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," 131.
[119] Walker and Foley, "Social Intelligence," 855.
[120] Wong *et al*., "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," 119.
[121] Jones and Day, "Discrimination of Two Aspects of Cognitive-Social Intelligence from Academic Intelligence," 489.
[122] Lee *et al*., "Social and Academic Intelligences," 543.
[123] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 113.
[124] Walker and Foley, "Social Intelligence," 850.
[125] Hedlund and Sternberg, "Too Many Intelligences? Integrating Social, Emotional, and Practical Intelligence," 139.
[126] Kihlstrom and Cantor "Social Intelligence," 363.
[127] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 113.

of a lack of theoretical rigor, format limitations (paper-and-pencil, self-report, uni-dimensional), and bad science that eventually led to their obsolescence. The more rigorous of these studies, particularly the three described in detail above, provide lessons that inform more contemporary efforts to assess SI. As we have seen, many of these historical tools are in fact partially integrated in many newer designs either as a subtest of the actual assessment mechanism or as a measure to determine the design's convergent validity.

The most notable of the lessons culled from the experiences of past attempts to measure SI reviewed here and touched upon in the previous two papers on SI include: (1) the need for the measurement construct to be situated firmly and clearly in a theory of SI, (2) the test design to be multi-method in format, and (3) the scales should reflect and measure the multidimensional nature of SI (that is, it should reflect both cognitive/ability and behavioral/affective components). Furthermore, the designs should ideally include a consideration of how SI can be linked to individual performance in an organizational or team setting as well as leadership effectiveness, two concerns of the Human Dimension's interest in SI. Importantly, the proposed definition of SI (page 4) accounts for the multidimensionality of SI; the choice of SI measurement instrument will dictate the other two concerns. These are some of the key elements to consider as we review contemporary SI measurement tools that the Army may be interested in using or learning from.

Contemporary Social Intelligence Measurement Tools

Tromsø Social Intelligence Scale (TSIS)

Silvera, Martinussen, and Dahl developed the Tromsø Social Intelligence Scale (TSIS) based on their study of experts' implicit understanding of SI.[128] As part of their initial validation study, the authors interviewed 14 psychology faculty to establish the following working definition of social intelligence: "the ability to understand other people and how they will react to different social situations."[129] This definition served as the basis of their measurement construct, and is also very similar to the multidimensional definition of SI we propose the Army adopt (page 4 above).

The goal of the TSIS is to present a SI measurement design that accounts for the multi-dimensional nature of SI. Reflected in the definition above, the authors acknowledge the cognitive ("…ability to understand other people…") and the behavioral ("…how they will react…") dimensions of social intelligence in the TSIS. It is important to note, however, that corresponding to the expert input they collected on implicit definitions of SI that

[128] Implicit theories and conceptualizations of SI were discussed in the first HDCDTF white paper: Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*: 16-17.

[129] David H. Silvera, Monica Martinussen, and Tove I. Dahl, "The Tromsø Social Intelligence Scale, a Self-Report Measure of Social Intelligence," *Scandinavian Journal of Psychology* 42 (2001): 314.

shaped the authors' definition of SI within the measurement construct, the TSIS places a significant emphasis on the cognitive portions of SI and relatively little emphasis on the behavioral dimension. A second crucial element of the mechanism's design is that it is short and easy to administer. Silvera *et al* argue that despite the wide interest in SI few commercially available measurement instruments have been developed, and of those many are time-consuming and unwieldy to administer.[130]

The TSIS is a self-report test that consists of three subscales of SI: (1) social information processing, (2) social skills, and (3) social awareness. These subscales were identified using Exploratory Factor Analysis to examine the results of a preliminary 103-item version of the TSIS tested among 202 university students. The social skills component measures social performance (the behavioral component of SI), while the social information processing and social awareness components measure social perception (the cognitive component of SI). The TSIS consists of a total of 21 items, with seven items for each of the three subscales.[131] Respondents are asked to rank themselves along a seven-point Likert scale for each item, ranging from "1" ("describes me extremely poorly") to "7" ("describes me extremely well"). The test should take most respondents no more than five minutes to complete. Each of the 21 items in the TSIS are presented in Figure 6 below.

Subscale/factor	Questions
Social information processing	• I can predict other peoples' behavior. • I know how my actions will make others feel. • I understand other peoples' feelings. • I understand others' wishes. • I can often understand what others are trying to accomplish without the need for them to say anything. • I can predict how others will react to my behavior. • I can often understand what others really mean through their expression, body language, etc.
Social skills	• I often feel uncertain around new people who I don't know. • I fit easily in social situations. • I am good at entering new situations and meeting people for the first time. • I have a hard time getting along with other people. • It takes a long time for me to get to know other well. • I am good at getting on good terms with new people. • I frequently have problems finding good conversation topics.
Social awareness	• I often feel that it is difficult to understand others' choices. • People often surprise me with the things they do. • Other people become angry with me without me being able to explain why. • It seems as though people are often angry or irritated with me when I say what I think. • I find people unpredictable. • I have often hurt other without realizing it. • I am often surprised by others' reactions to what I do.

Figure 6. Subscale questions on the Tromsø Social Intelligence Test (TSIS).[132]

[130] David H. Silvera, Monica Martinussen, and Tove I. Dahl, "The Tromsø Social Intelligence Scale, a Self-Report Measure of Social Intelligence," *Scandinavian Journal of Psychology* 42 (2001): 314.
[131] Alexandrina L. Dumistrescu, Daniela Badiță, Carmen Beatrice Dogaru, Carmen Toma, and Carmen Duță, "The Association o Social Desirability and Social Intelligence with Smoking Among Undergraduates," *Procedia—Social and Behavioral Science* 159 (2014): 553.
[132] David H. Silvera, Monica Martinussen, and Tove I. Dahl, "The Tromsø Social Intelligence Scale, a Self-Report Measure of Social Intelligence," *Scandinavian Journal of Psychology* 42 (2001): 319.

In their initial test, the authors found the scale to be reliable. As predicted, the results indicated that SI might rely more on cognitive skills than behavioral skills. Though the English version of the TSIS has not been rigorously tested, independent research that has evaluated the tool in other languages have confirmed its high reliability.[133] Although it is a self-report study, the authors argue that the format of the TSIS is not susceptible to faking due to a measure of social desirability response bias that they included in the validation process.[134] Meijs later confirmed this in another study.[135] In summary, Bartone states that the TSIS "appears to be an excellent candidate for assessing social judgment in a… straightforward manner."[136]

The TSIS is appealing for its brevity and easy administration. Although it hasn't been widely validated, studies that are available for it are promising. While the test is publically available the Army would need to empirically validate the TSIS's utility for the unique purposes that the Army is interested in, which would require modest initial resources. Finally, the TSIS has been developed and validated for several languages, some of which are key military partners for the US Army (including Romania, Turkey, Italy, and Norway). As such, the TSIS may prove useful in facilitating multinational cooperation as well as selecting and placing Army personnel on multinational teams.[137]

Despite these potential benefits, the TSIS may be of questionable utility to the Army for a number of reasons. First, the test is relatively new. While results are thus far positive, independent scholars have not subjected the test (particularly its English version) to rigorous analysis and validation. The relative absence of scientific and independent validation may preclude the Army's investment in the TSIS. Importantly, the TSIS has not

[133] Szabo Kinga and Kotta Ibolya, "The Predictive Value of Social Intelligence for Cooperative Behavior in a Task-Oriented Interaction Paradigm: A Pilot Study," *Transylvanian Journal of Psychology* 14, No. 2 (2013): 263.
[134] Silvera *et al*., ""The Tromsø Social Intelligence Scale, a Self-Report Measure of Social Intelligence," 314.
[135] Noortje Meijs, Antonius H.N. Cillessen, Ron H. J. Scholte, Eliane Segers, and Renske Spijkerman, "Social Intelligence and Academic Achievement as Predictors of Adolescent Popularity," Journal of Youth Adolescence 39 (2010): 68.
[136] Paul T. Bartone, Jarle Eid, Bjorn Helge Johnsen, Jon Christian Laberg, and Scott A. Snook, "Big Five Personality Factors, Hardiness, and Social Judgment as Predictors of Leader Performance," *Leadership & Organization Development Journal* 30, No. 6 (2009): 515.
[137] For information on the Human Dimension's interest in multinational teams, please see: Human Dimension Capabilities Development Task Force, *Cultural Interoperability: Applying Social Categorization to Better Understand and Mitigate Cultural Friction in Multinational Operations* (Fort Leavenworth, KS: Mission Command Center of Excellence, January 2016); Human Dimension Capabilities Development Task Force, *Cross-Cultural Competence: Introduction and Overview of Key Concepts* (Fort Leavenworth, KS: Mission Command Center of Excellence, April 2015); Human Dimension Capabilities Development Task Force, *Cross-Cultural Competence: Review of Assessment Methodology and Available Assessment Tools* (Fort Leavenworth, KS: Mission Command Center of Excellence, June 2015); Human Dimension Capabilities Development Task Force, *Cross-Cultural Competence: Overview of Cross-Cultural Training Theory and Practice for the Army* (Fort Leavenworth, KS: Mission Command Center of Excellence, September 2015).

been validated against measures of academic intelligence, nor against existing measure of personality such as the Big Five (both would be indicators of discriminant validity). Second, the test relies on a single method (self-report). Although the potential shortcomings of the self-report format (susceptibility to faking and social desirability bias) are supposedly accounted for in the original design, it may be cause for concern in future validation studies. Third, the definition that the TSIS relies upon may be a "rather specific view" of SI.[138] This view may align with some of the intended populations or applications of SI in the Army, but likely not all. Fourth, and related to the previous point, the TSIS, though based on a similar multidimensional definition of SI that we recommend the Army adopt, has not been developed explicitly to measure individual SI as it relates to a team environment or for leadership, two of the key concerns of the Army's interest in SI. In fact, the original study that validated the TSIS was based on a relatively small sample (n=202) of Norwegian college students. The indicators of high SI among this sample may be considerably different than that among US Army personnel. These concerns don't mean that the TSIS will not accurately predict relevant SI among US Army personnel; only that it would better serve the US Army to conduct additional empirical research to more rigorously prove that the TSIS can predict such performance among its unique personnel to achieve mission success in order to justify the Army's investment in the tool.

Magdeburg Test of Social Intelligence (MTSI)

A more recent measurement tool is the Magdeburg Test of Social Intelligence (MTSI). A group of German psychologists, several of them from the University of Magdeburg, published the results of two initial validation studies on the test in 2013. The authors argued that the majority of SI measurement constructs demonstrated low convergent validity with other measures of SI and could rarely be adequately distinguished from academic intelligence (discriminant validity).[139] They also believed that—contrary to the authors of the TSIS—these limitations were due to reliance on verbal stimuli of artificial, unrealistic material in a self-report format. Furthermore, they cited recent MTMM study designs of SI that provided compelling evidence of the multidimensional nature of the SI construct as an important guide to developing future SI measurement tools. These concerns provided some of the key motivation for the authors to develop the MTSI. The MTSI is based on a performance model of SI that is supported by strong data from a previous study.[140] The performance model is a multidimensional conceptualization of SI; however, it includes in its framework cognitive abilities only and not any behavioral components (such as personality traits and motivation). The logic is that cognitive abilities greatly influence behavior and are sufficient enough to validly predict performance across a generalized range of social situations. Behavioral components

[138] Lara Delič, Petra Novak, Jan Kovačič, and Andreja Avsec, "Self-reported Emotional and Social Intelligence and Empathy as Distinctive Predictors of Narcissim," *Psychological Topics* 20, No. 3 (2011): 481.
[139] Conzelmann *et al*., "New Findings About Social Intelligence," 119.
[140] Weis and Süß, "Reviving the Search for Social Intelligence," 5.

may be able to relate to the demands of specific social situations but behavioral components are too broad and complex for such tools to measure with any accuracy or consistency in a discrete measure of SI. The relationship between the cognitive domains and the behavioral domain of the performance model is illustrated in Figure 7. This may ultimately be a limitation of the study, but the authors argue that measuring cognitive-social abilities are sufficient to effectively assess a broad conceptualization of SI in addition to simplifying the test as much as possible.

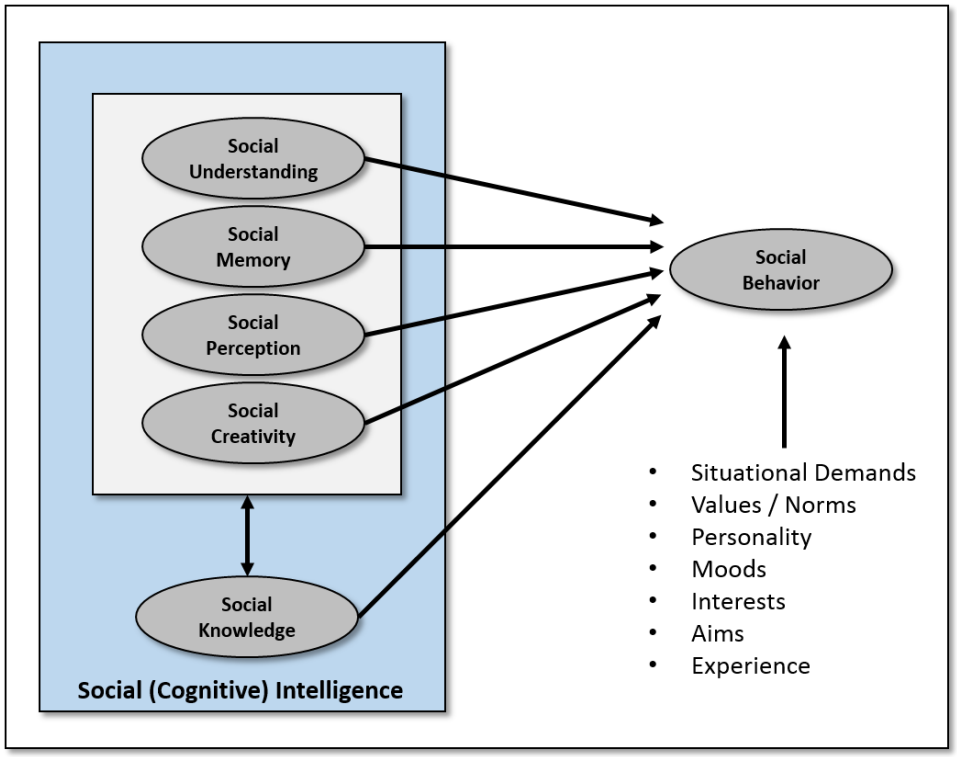

Figure 7. Performance model of SI, which the MTSI is based upon.[141]

The performance model of SI that the MTSI is based upon consists of five domains: (1) social understanding, (2) social memory, (3) social perception, (4) social flexibility, and (5) social knowledge. The authors postponed development of the social flexibility and social knowledge components due to the "enormity" of the task that operationalizing them would require, however, the MTSI only measures the first three dimensions of the performance model: social understanding, social memory, and social perception.[142] These are described in Figure 8.

[141] Weis and Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts,"
[142] Conzelmann *et al*., "New Findings About Social Intelligence," 120.

Domain	Description
Social understanding	• The ability to understand social stimuli against the background of a specific social situation. • Includes diversely labeled requirements such as o Recognition of the mental states behind words (similar to a component of the GWSIT), o Comprehension of observed behaviors in the social context in which they occurred (such as was measured in the Six Factor Tests of SI), o Decoding social cues. • Also called "social inference," "social interpretation," or "social judgment."
Social memory	• The ability to store and recall objectively given social information that can vary in complexity. • Originally developed as part of the GWSIT. • Also called "memory for names and faces".
Social perception	• The ability to perceive socially relevant information quickly in more or less complex situations. • Distinguished from social understanding in that social perception relies on objectively present information in order to exclude interpretative requirements.

Figure 8. Domains measured by the Magdeburg Test of Social Intelligence (MTSI).[143]

The MTSI consists of performance tests for each of these domains. The subtests present realistic and mostly nonverbal material using a variety of multimedia. One review of the MTSI described its format:

> *The stimuli were selected on the basis of a taxonomy of social situations… and culled from actual [video] footage of volunteers [the test-takers] who were recorded for long periods of time. After viewing the stimuli [including emails, letters, phone-call recordings, photos, and videos] that experts (academic psychologists) selected as test items the [test-takers] answered detailed questions about the social and emotional content of those materials, which were used as the basis for scoring. That is, the [MTSI] is an ecologically valid*[144] *assessment of social intelligence based on target scoring.*[145,146]

This method is in stark contrast to the contextually abstract self-report formats of many other measures of SI, including the TSIS. The intent is to present test subjects with socially relevant stimuli embedded in realistic social contexts, two critical concerns for validly measuring social abilities. The initial version of the MTSI consisted of 16 tasks, several of which are described in Figure 9 as examples. Due to the personalized and detailed nature of the test design, the MTSI is extremely time-consuming to administer. One sample of the initial validation study took approximately 10 hours to complete over the course of two days, while another sample took 11 hours over two days.

[143] Adapted from Conzelmann *et al*., "New Findings About Social Intelligence," 120.
[144] Ecological validity is the extent to which the findings of a study can be generalized to real-world situations.
[145] Target scoring in this case means that the same people who created the stimuli of the test also know the correct or appropriate answer and score the test-taker appropriately.
[146] Benjamin Orchard, Carolyn MacCann, Ralf Schulze, Gerald Matthews, Moshe Zeidner, and Richard D. Roberts, "New Directions and Alternative Approaches to the Measurement of Emotional Intelligence," in *Assessing Emotional Intelligence: Theory, Research, and Practice*, edited by Con Stough, Donald H. Saklofske, and James D.A. Parker (New York: Springer Science+Business Media, LLC, 2009): 333.

Domain	Test title	Description	Presentation medium	Response medium	Response format	Length (mins)
Social memory	Memory for conversations	Subjects have to remember socially relevant details from 12 audio-recorded monologues or conversations.	Computer	Paper and pencil	Free form or multiple choice	15
Social perception	Person perception videos	Subjects have to detect a target individual within videos of crowds at public locations as quickly as possible.	Computer	Computer	Reaction-time based	13
Social understanding	Scenarios 1-4	Subjects are required to judge the emotions, cognitions, and relationships of a target individual based on written and spoken language, pictures, and videos. Presentation and response times are unlimited.	Computer	Paper and pencil	Rating	≈ 20
Social memory	Memory for situations – video	Subjects have to remember social relevant details from four video scenes depicting different social events.	Computer	Paper and pencil	Free form or multiple choice	22
Social perception	Perception of social cues in texts 1	Subjects are presented statements from target individuals. After reading a short text, they have to make a decision about the truthfulness of the statement in question.	Computer	Computer	Reaction-time based	14

Figure 9. Examples of tasks on the MTSI and their descriptions.[147]

The realistic, personalized, and contextualized nature of the MTSI is very appealing. So, too, is its intent to measure a broad ability conceptualization of SI instead of a more specific measure that includes behavioral components which have been difficult to prove empirically in SI. For these same reasons, however, the MTSI might be problematic for the Army's use. The formidably detailed format of the tool may be cost prohibitive to effectively develop and administer to a wide swath of Army personnel (although it may be more appealing to use as a targeted program among smaller, specialized organizations like those found within USASOC). Furthermore, because it is broad it may provide a helpful generalized account of individual social ability (which might be useful to administer to recruits, for instance, if it were not so cost and time prohibitive) but provide little in the way of accurate precision for specific team or leader tasks. That the measure is very new is an additional concern. And while the initial publication on the MTSI was empirically and theoretically rigorous and provided positive evidence of its validity, these results have not yet been subjected to any serious, peer-reviewed, and independent verification. Also, the samples of the first two validation studies of the MTSI consisted of German university students and not professionals. However, in time this test appears to be extremely thorough, based on a specific and comprehensive model of SI that is multidimensional and makes use of a wide range of socially- and personally- relevant situations through multimedia (the MTSI takes advantage of a number of test formats, including situation judgment tests, assessment centers, and performance-based tests). It is worth keeping an eye on future validation

[147] Conzelmann *et al*., "New Findings About Social Intelligence," 121-122.

studies or amendments of the MTSI, or for the Army to consider adopting and tailoring to its own use.

Background Data Measure of Social Intelligence

In 1995 the Army commissioned a team led by Zaccaro to develop a preliminary measure of SI. Theirs is a "background data measure of SI" (abbreviated here as BDMSI) that was commissioned to support the US Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) and was published as a technical report for the United States Army Research Institute for the Behavioral and Social Sciences (ARI).[148] Background data measures are also called life history measures and are generally administered in self-report formats, as the BDMSI is.[149] While the results of the test are preliminary, the BDMSI is notable in that is was designed explicitly to account for individual performance on team tasks in the US Army.[150]

The BDMSI is rooted in definitions of SI that focus on behavioral effectiveness of individuals in social contexts.[151] Zaccaro *et al* specifically cite the conceptualizations of SI offered by Ford and Tisak[152] and Marlowe,[153] the latter of which is suggested in this paper as the one that the Army should adopt as a working definition.[154] A key feature of the BDMSI is its intent to measure "both social perceptiveness and flexible behavior in accordance with situation requirements."[155] The BDMSI is therefore based on a multidimensional approach to SI that situates respondents in socially relevant and meaningful scenarios.[156] The study grew out of interest to develop a measurement tool to aid the USAJFKSWCS to "attract, select, and train the highest quality soldiers for Special Forces". [157] In this regard, the intent of the BDMSI, albeit for a more specific population, very much reflects the Human Dimension community's interest in SI and the purpose of this paper: namely, leveraging SI to improve how the Army recruits, selects, promotes, and develops it personnel to more effectively achieve mission success. Additionally, the BDMSI was meant to address what the authors considered the "weak and ineffective" measures of SI that were then available.[158]

---

[148] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, vii.
[149] *Ibid*., 8.
[150] *Ibid*., 15-16.
[151] *Ibid*., 8.
[152] Ford and Tisak, "A Further Search for Social Intelligence," 197. "…one's ability to accomplish relevant objectives in specific social settings."
[153] Marlowe, Jr. "Social Intelligence," 52. "The ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding."
[154] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 15.
[155] *Ibid*., 8.
[156] *Ibid*.
[157] *Ibid*., vii.
[158] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, vii.

The BDMSI consists of a 41-item self-report "background data measure". The authors chose this procedure due to the strong evidence of such methodologies to be "predictive of future behavior patterns."[159] Background data items require respondents to rate themselves on a variety of "developmentally-relevant events" from throughout their life experiences.[160] In the BDMSI, respondents are asked to rate themselves on 5-point scales appropriate for each item. Background data measures account for *typical* individual performance (as opposed to accounting for *maximal*, or potential, performance, which are better measured with cognitive ability mechanisms such as the MTSI).[161] So, while multidimensional, the BDMSI emphasizes behavioral components rather than cognitive components of SI. The background data approach is a unique form of a self-report assessment tool. The authors argue that this approach to measuring SI reflects indices of a broad range of "dispositional properties and individual difference characteristics such as personality, cognitive capacities, affective qualities, and motivational variables."[162]

The 41 items of the BDMSI were generated to reflect three domains (or subscales) of SI: (1) social perceptiveness (which includes the subcomponents interpersonal perception and systems perception), (2) behavioral flexibility, and (3) social competence. The subscales are described in Figure 10 while a few of the 41 items of the BDMSI are presented in Figure 11 as examples. The domains are based on the conceptualization of SI developed by Zaccaro *et al*. Importantly, this conceptualization explicitly links SI to leader effectiveness (a key concern of the Army's interest in the construct). Furthermore, their conceptualization was guided by Marlowe's definition of SI that has been discussed previously. Zaccaro *et al*'s understanding of SI, like Marlowe's, is multidimensional. The items in the BDMSI were proposed and selected by a panel who were each expert in background data measures and also familiar with contemporary SI literature.

Domain	Description
Social perceptiveness	• "[A] capacity to be particularly aware of and sensitive to 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."[163] • Includes the subcomponents *interpersonal perception* (which is concerned with perception and awareness of other individuals) and *systems perception* (aka organizational perception, which is concerned with perception and awareness of organizational/institutional norms, expectations, culture, and so forth). • SI is concerned with "accurate perception and judgment of both individuals and social systems."[164]

[159] *Ibid*., 9.
[160] *Ibid*.
[161] Phillip L. Ackerman and Eric D. Heggestad, "Intelligence, Personality, and Interests: Evidence of Overlapping Traits," *Psychological Bulletin* 121, No. 2 (1997): 219-245.
[162] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 9.
[163] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 2-5.
[164] *Ibid*., 5.

Domain	Description
Behavioral flexibility	• The ability to "respond equally well to very different social demands."[165] • "Requires a large and broad response repertoire and, perhaps more importantly, a cognitive capacity to match responses to particular social requirements."[166] • "Results from enriched episodic knowledge structures that contain a wide variety of behavioral scripts with fine tuned action cues that facilitate appropriate situational matching."[167] • In some decriptions, a sub-element of social competence.
Social competence	• "An ability to act appropriately in situations and achieve one's socially-oriented goals."[168] • "The ability and willingness to respond in significantly different way to correspondingly different situational requirements."[169] • "Reflects a strong motivational component that emphasizes socially-oriented values and a commitment to others."[170]

Figure 10. Domains or subscales of the Background Data Measure of Social Intelligence.

Domain	Item
Social perceptiveness – interpersonal	• How difficult has it been for you to figure out when it was a good time to ask for a favor? • How difficult has it been for you to recognize people's special capabilities? • To what extent have you sensed when trouble was likely to arise?
Social perceptiveness – systems	• How often have you correctly anticipated conflict between two acquaintances or work groups? • To what extent have you been able to predict group decisions before they occur? • To what extent would you coworkers come to you for advice about what it the appropriate behavior in different work situations?
Behavioral flexibility	• How difficult has it been to be polite to people you dislike when meeting in a social situation? • How much has it bothered you when there were unexpected changes in meetings? • How comfortable are you working with different groups having very different goals and agendas?
Social competence	• How often have you been described as fast on your feet? • How easy has it been for you to communicate with others? • How often have friends asked you for advice on how to talk to others?

Figure 11. Examples of items on the Background Data Measure of Social Intelligence.[171]

The initial validation study surveyed 189 US Army personnel, including 25 officers (ranging in rank from Second Lieutenant to Colonel) and 164 enlisted personnel.[172,173] The authors of this study demonstrated that the BDMSI had acceptable reliability. It was measured against two scales of academic intelligence (the Wonderlic and ASVAB) in order to establish its discriminant validity;[174] the BDMSI was also measured against portions of other measures of SI, including the "Cartoon Predictions" and "Social Translations" subtests of the Four Factor Tests of SI, in order to establish its convergent validity.[175] Finally, test participants were peer-rated on their individual effectiveness as

[165] *Ibid*.
[166] *Ibid*.
[167] *Ibid*., 6.
[168] *Ibid*., 5.
[169] *Ibid*.
[170] *Ibid*.
[171] Adapted from Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 12-14.
[172] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 11.
[173] Stephen J. Zaccaro, *Models and Theories of Executive Leadership: A Conceptual/Empirical Review and Integration*, United States Army Research Institute for the Behavioral and Social Sciences, October 1996, 219.
[174] Zaccaro *et al*., *Investigating a Background Data Measure of Social Intelligence*, 16.
[175] *Ibid*., 15.

both team members and leaders in order to establish the test's criterion related validity (which ensures that the test is able to accurately predict actual outcomes in the real world: in this case, individual performance and leadership in an specific Army environment).[176] The peer-ratings are an important social component of the BDMSI in that peers are able to provide an inherently social assessment of another individual's performance.

In addition to providing a useful preliminary measurement of SI, the BDMSI provides a number of other notable findings. Zaccaro *et al*'s study shows that SI, as measured by the BDMSI, accounted for "unique variance in leader status" (along with measures of metacognition and openness to experience);[177] however, SI did not predict any variance of team performance. To break it down further: *systems perception* (a component of the *social perceptiveness* domain of the BDMSI explained above) and *behavioral flexibility* both "contributed significantly to the prediction of [military] rank and career achievement" among the Army personnel study population. [178] Notably, *interpersonal perception*, the other component of *social perceptiveness*, had no correlation to rank and achievement in the validation study. [179] A review of the study concluded by stating that the results of the BDMSI support the importance of social capacities for organizational leadership.[180]

The BDMSI appears to be a particularly promising measure of SI for the Army within the Human Dimension. Most importantly, it is multidimensional and has been developed explicitly to account for individual performance and leadership in an Army setting. The representation of a "systems perception" component and its clear linkage in the BDMSI to SI and individual effectiveness may be of particular interest to the Army. Unlike other measures of SI, which tend to measure SI in either personally-important contexts or no context at all, the BDMSI takes into account the importance of awareness not only of individuals but also of the larger organization in which the social interaction is taking place (in this case, within the Army). The BDMSI's focus on systems perception correlates well to linking SI to Army mission success by keeping the specific goals of the Army a top priority when considering how to interact with other individuals and teams, and assess the effectiveness of that interaction in terms of institutional success.

The shortcomings of the BDMSI, however, are also clear. Most notably, the test was developed in 1995 and has, as far as we can tell, been left idle over the intervening two decades. There have been no additional independent validation studies of the BDMSI nor has the measure been updated or amended (for instance, it may be worthwhile to integrate more nonverbal components that make use of recent technological advances

[176] *Ibid*., 16.
[177] Stephen J. Zaccaro, Deanna Banks, Lee Kiechel-Koles, Cary Kemp, and Paige Bader, *Leader and Team Adaptation: The Influence and Development of Key Attributes and Processes*, Technical Report 1256, United States Army Research Institute for the Behavioral and Social Sciences, August 2009, 23.
[178] Zaccaro, *Models and Theories of Executive Leadership: A Conceptual/Empirical Review and Integration*, 219.
[179] *Ibid*.
[180] *Ibid*., 385.

in multimedia platforms). On the positive side, however, the BDMSI was developed for the Army by ARI, so there are likely no obstructing proprietary issues with adopting it or amending it in the future for use in the Army. At the very least, it may be worth the Army revisiting the BDMSI to commission some additional independent validation of the original results to explore if it might be used again for a wider audience and the specific interests of the Army Human Dimension community. Finally, there are the usual concerns with the BDMSI that are present for other nascent measures of SI: the format is exclusively self-report and the initial validation study consisted of a small sample size. As mentioned above, these concerns could be addressed relatively quickly with future validation studies of the original tool.

Measurement Summary

Thorndike's observation nearly a century ago that "convenient tests of social intelligence are hard to devise" remains largely true today.[181] By some estimates IQ tests continue to be the best predictors of workplace performance.[182] Scholars, however, continue to develop measures of SI to address what IQ cannot with the intent of better assessing social abilities that may influence professional performance and outcomes. These assessment tools build upon the lessons of preceding attempts, becoming increasingly sophisticated and, in some ways, more accurate as methodologies and analysis develop over time. As we have reviewed, there is a range of approaches to SI measurement that make use of a variety of historical and emerging methodologies (self-report, situational judgment tests, peer- /other- report). In turn, each of these methods measures a variety of components of SI (cognitive, behavioral, and multidimensional as well as implicit and personality perspectives of SI that were not addressed here). As we have explored, each of these approaches has benefits and none are without challenges. Figure 12 details the key components of the measurement tools we have reviewed.

[181] Edward L. Thorndike, "Intelligence and Its Uses," Harpers Monthly Magazine 140 (1920): 231.
[182] John Antonakis, Neal M. Ashkanasy, and Marie T. Dasborough, "Does Leadership Need Emotional Intelligence," *The Leadership Quarterly* 20 (2009): 248.

	Tool	Format	Dimension(s)	Intent	Theory-based	Length
Historical tools	George Washington Social Intelligence Test (GWSIT)	• Situational Judgment Test (SJT) • Performance-based test	• Based on multidimensional conceptualization of SI, but measures cognitive SI.	• General population • Tested among students and professionals	No	• Five scales
	Chapin Social Insight Test (CSIT)	• Self-report • Paper-and-pencil	• Cognitive ("social insight")	• General population	No	• 25 items
	Four Factor Tests of SI	• Performance-based tests (multiple choice)	• Based on multidimensional conceptualization of SI, but measures cognitive SI.	• General population	Yes	• Four subtests
Contemporary Tools	Tromsø Social Intelligence Scale (TSIS)	• Self-report	• Based on multidimensional conceptualization of SI, but measures cognitive SI.	• General population • Tested among university students	No	• 21 total items • 3 subscales • ≈ 5 minutes total to complete
	Magdeburg Test of Social Intelligence (MTSI)	• Multimethod • Situational judgment test • Assessment center • Performance-based test	• Based on multidimensional conceptualization of SI, but measures cognitive SI.	• General population • Tested among university students	Yes	• 16 tasks • ≈ 10-11 hours total to complete
	Background Data Measure of Social Intelligence (BDMSI)	• Self-report • Background measure (life history)	• Multidimensional: cognitive and behavioral	• Intended for Special Forces • Tested among broader Army personnel, including Soldiers and officers	No	• 41 items

Figure 12. Overview of key elements for select SI measurement tools.

The three contemporary measures reviewed above represent a sample of this variety. Despite the broad interest in SI there have been relatively few rigorous attempts to develop SI—both now and throughout its history. For instance, Landy states that between 1920, when the construct as we know it was first suggested by Thorndike, and 1983 only "four assessment devices [were] formally proposed and marketed… for the measurement of social intelligence."[183] The limited number of such devices available for public analysis and use continues to this day. This speaks to the difficulty (or the futility, as some might argue) of the endeavor.

The three contemporary examples reviewed above are not exhaustive. Instead, they represent some of the most promising contemporary efforts to measure SI that might be of particular interest to the Army and it interest in developing "trusted Army Professionals as effective team members who thrive in complex social environments, adapt to diverse cultures, communicate effectively, and build relationships."[184] The discussion also provides a survey of the diversity of approaches that have been developed.

[183] Landy, "The Long, Frustrating, and Fruitless Search for Social Intelligence," 112.

[184] Department of the Army, *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win in a Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*, 2015, 8.

Other contemporary measures of SI present similar methodologies, with corresponding advantages and challenges. For instance, the Interpersonal Perception Task-15 (IPT-15) is a multimedia test of social perception, intended to measure an individual's ability to decode nonverbal cues to determine the mental states (emotions, intentions, etc.) of others.[185] The IPT-15 is a cognitive ability test that presents 15 video scenes of different social settings and then asks respondents a number of relevant questions ("Who is the child of the two adults?") in order to assess a person's social sensitivity.[186] Alternatively, Schneider and Johnson's Social Knowledge Test (SKT) is a 6-scale, video-based, behavioral test of SI.[187] Importantly, the measure was developed to specifically measure individual social performance in the Army and the initial results, like the BDMSI, were published as an ARI report.[188] The limitations of these tests are similar to some of the examples described in more detail above: namely, small sample sizes and limited or absent independent analysis and validation.

Other mechanisms cited in the literature don't attempt to measure SI explicitly, but rather sub-components of it or constructs that are similar but not explicitly conceptualized as SI (such as "social skills," "social competence," and "social functioning"). For instance, Riggio's Social Skills Inventory (SSI) incorporates social and emotional components to form a broader measure of social functioning than what many conceptualizations of SI consist of.[189] Importantly, the SSI is embedded in leadership research and intended for an organizational/workplace setting. While not assessing SI explicitly, such an approach may still serve the Army's ultimate goal of better assessing personnel, including Soldiers, leaders, and civilians.

Finally, some scholars have sought to identify specific components of existing IQ measures to account for SI. For instance, the Wechsler Adult Intelligence Scale—Revised (WAIS-R) is an established measure of traditional human intelligence (dating back to 1944).[190] It contains "Comprehension" and "Picture Arrangement" subtests that include some items that have explicit social relevance or a social component. As a result, some have tried isolating these subtests of the WAIS-R and linking them to SI. Results have been mixed, but more recent observations have not been favorable.[191,192,193] For what it

[185] Weis and Süß, "Reviving the Search for Social Intelligence," 7.
[186] Ibid.
[187] Melissa Shuffler, Heidi Keller-Glaze, Beret Strong, William S. Weyhrauch, Jessica Jenkins, Jonathan Bryson, and Kimberly A. Metcalf, *Organizational Social Effectiveness: An Annotated Bibliography*, Research Product 2014-03, United States Army Research Institute for the Behavioral and Social Sciences, January 2014, A-25.
[188] Schneider and Johnson, *Direct and Indirect Predictors of Social Competence in United States Army Junior Commissioned Officers*, 26.
[189] Riggio, "Assessment of Basic Social Skills," 652.
[190] Gary J. Sipps, G. William Berry, and Eileen M. Lynch, "WAIS-R and Social Intelligence: A Test of Established Assumptions That Uses the CPI," *Journal of Clinical Psychology* 43, No. 5 (1987): 499.
[191] Sipps *et al*., "WAIS-R and Social Intelligence," 499.

is worth, Wechsler himself, in an oft-quoted observation, claimed that SI was simply general intelligence applied to social situations.[194]

While the TSIS, MTSI and BDMSI described in the previous section appear to be the most sophisticated and promising tools available for the Army's use, these other approaches may be worth exploring as well for a variety of applications and populations. For the present concerns of the Human Dimension, however, we believe the BDMSI to be the most appropriate tool to consider. Most importantly, the BDMSI is designed specifically to measure US Army Soldier and leader performance in the unique working environment of the Army. Furthermore, the measure is relatively short and easy to administer, relies on a multidimensional conceptualization of SI, and is already owned by the Army (and therefore would require no copyright or proprietary investment). For these reasons, the BDMSI appears to be the most logical starting point among the available tools to explore SI measurement in and for the Army in order to optimize the performance of its personnel to, as the *US Army Operating Concept* states, "improve critical thinking, increase cognitive… performance, foster intuition and social empathy… facilitate talent management, enhance leader training, and strengthen unit cohesion."[195]

Developing Social Intelligence

Since it was first proposed nearly a century ago, a number of approaches have been used in attempts to define SI. This genesis resulted in an extensive and varied catalogue of academic and practical products that describe SI through a list of cognitive and behavioral components. Some of these are highlighted in Figure X. Combined with an absence of any coherent theory of SI, the competing component lists of SI serve to undermine its validity and progress towards properly distinguishing it from academic intelligence.

Author(s)	Proposed components of SI
Goleman and Boyatzis (2008)[196]	Empathy, attunement, organizational awareness, influence, developing others, inspiration, teamwork.
Boyatzis (2010)[197]	Empathy, organizational awareness, inspirational leadership, conflict management, influence, coach & mentor, teamwork.

[192] Jonathan M. Campbell and David M. McCord, "The WAIS-R Comprehension and Picture Arrangement Subtests as Measures of Social Intelligence: Testing Traditional Interpretations," *Journal of Psychoeducational Assessment* 14 (1996): 247.
[193] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 17.
[194] Kihlstrom and Cantor, "Social Intelligence," 360.
[195] Department of the Army, *The U.S. Army Operating Concept,* 39.
[196] Daniel Goleman and Richard Boyatzis, "Social Intelligence and the Biology of Leadership," *Harvard Business Review* (September 2008): 5.
[197] Richard E. Boyatzis, "Competencies in the 21st Century," *Journal of Management Development* 27, no. 1 (2008): 81.

Author(s)	Proposed components of SI
Zaccaro *et al.* (2004)[198]	Social perceptiveness: social awareness, social acumen. Behavioral flexibility: response selection, response enactment.
Marlowe (1986)[199]	Prosocial attitude, social skills, empathy skills, emotionality, social anxiety.
Wong (1995)[200]	Social perception, social insight, social knowledge.
Weis and Süß (2005)[201]	Social understanding, social memory, social perception, social creativity, social knowledge.
Tisak and Ford (1983)[202]	Social competence, empathy, social goal attainment
Lee (2000)[203]	Social inference, social knowledge
Riggio and Reichard (2008)[204]	Social expressivity, social sensitivity, social control.
Hoffman and Frost (2006)[205]	Good oral communication skills, self-confidence, sociability, capacity for status, stress tolerance, understanding the social dynamics of organizational problem-solving.
Bjorkvist *et al.* (2000)[206]	Perceptual skills, cognitive-analytical skills, behavioral (skills)
Schneider *et al.* (1996)[207]	Social competence: extraversion, warmth, social influence, social insight, social openness, social appropriateness, social maladjustment.

Figure 13. Select examples from the literature of proposed components of SI.

Despite these shortcomings, scientific evidence suggests SI, or proposed elements that comprise it, link to job performance and leader effectiveness. While differing in details, these conceptualizations generally concede that SI is multidimensional, as we have discussed. In this view, SI is composed of two main characteristics of *social perceptiveness*, which allows an individual to "read" a social situation accurately, and *behavioral flexibility*, which allows an individual to transform that perceptiveness into action by responding appropriately to the demands of various social situations.[208,209]

[198] Stephen J. Zaccaro, Cary Kemp, and Paige Bader, "Leader Traits and Attributes," in *The Nature of Leadership*, edited by John Antonakis, Anna T. Ciancolo, and Robert J. Sternberg (Thousand Oaks, CA: Sage Publications, 2004): 115.

[199] Herbert A. Marlowe, Jr. "Social Intelligence: Evidence for Multidimensionality and Construct Independence," *Journal of Educational Psychology* 78, no. 1 (1986): 52.

[200] Chau-Ming T. Wong, Jeanne D. Day, Scott E. Maxwell, and Naomi M. Meara, "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students," *Journal of Educational Psychology* 87, no. 1 (1995): 117.

[201] Susanne Weis and Heinz-Martin Süß, "Social Intelligence—A Review and Critical Discussion of Measurement Concepts," In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts (Cambridge, MA: Hogrefe & Huber Publishers, 2005): 203.

[202] Martin E. Ford and Marie S. Tisak, "A Further Search for Social Intelligence," *Journal of Educational Psychology* 75, no. 2 (1983): 202.

[203] Jong-Eun Lee, Chau-Ming T. Wong, Jeanne D. Day, Scott E. Maxwell, Pamela Thorp, "Social and Academic Intelligences: A Multitrait-Multimethod Study of their Crystallized and Fluid Characteristics," *Personality and Individual Differences* 29 (2000): 539.

[204] Ronald E. Riggio and Rebecca J. Reichard, "The Emotional and Social Intelligences of Effective Leadership: An Emotional and Social Skill Approach," *Journal of Managerial Psychology* 23, no. 2 (2008): 171.

[205] Brian J. Hoffman and Brian C. Frost, "Multiple Intelligences of Transformational Leaders: An Empirical Examination," *International Journal of Manpower* 27, no. 1 (2006): 39.

[206] Kaj Bjorkvist, Karin Osterman, and Ari Kaukiainen, "Social Intelligence – Empathy = Aggression?" *Aggression and Violent Behavior* 5, no. 2 (2000): 192.

[207] Robert J. Schneider, Phillip K. Ackerman, and Ruth Kanfer, "To 'Act Wisely in Human Relations:' Exploring the Dimensions of Social Intelligence," *Personality and Individual Differences* 21, no. 4 (1996): 470-471.

[208] Hoffman and Frost, "Multiple Intelligences of Transformational Leaders," 39.

[209] Crowne, "The Relationships Among Social Intelligence, Emotional Intelligence and Cultural Intelligence," 149.

Naturally, people's aptitude with either of these dimensions differ, which partially accounts for individuals' differing effectiveness in social interactions.

The role of SI in organizational outcomes on leader effectiveness and job performance is of obvious interest to the Army for a number of reasons. Most importantly, an effective and valid approach to SI specifically tailored to unique Army mission sets may provide it with a capability to more effectively identify, assess, develop, and promote its personnel. This naturally coincides with the Army's current Human Dimension effort. More broadly, SI provides a powerful framework for understanding human behavior in social contexts (though of course it is not without its limitations, as were noted in the HDCDTF white paper, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative*[210]). This is reflected in Army research, which has often addressed the role of SI in the Army explicitly,[211] and doctrine, which has incorporated many of the principles of SI more implicitly.[212] The Army's interest in linking SI to individual performance, leadership, and team outcomes guides how it ought to consider the utility and suitability of SI development programs.

Due to the theoretical, conceptual, and operational shortcomings of SI discussed throughout this series, it comes as no surprise therefore that there is a paucity of empirical research on methods that are explicitly designed to improve or develop SI. A seemingly obvious obstacle to identifying or developing effective programs that do so is establishing if such programs are successful. That is, if we don't have an independently validated and agreed upon method to effectively measure SI (which in turn is at least partially due to a lack of any agreed upon definition of SI) how can we accurately determine if training or education programs to develop SI in individuals are successful? While there is continued interest and there have been notable developments and progress in the subject, SI conceptualization and measurement are very real shortcomings—as we have reviewed *ad nauseam* throughout these white papers. This presents a fundamental problem in productively identifying SI development programs that the Army should keep in mind.

The most logical approach to developing SI is to address specific components of it to improve rather than attempting to improve SI as a whole. The multidimensional approach to SI facilitates this by breaking the concept down into distinct components that can more readily be addressed through training and education. For instance, many multidimensional conceptualizations of SI separate cognitive abilities from behavioral effectiveness (which are in turn each made up of distinct sub-components). This is reflected in Marlowe's multidimensional definition of SI that we propose the Army adopt:

---

[210] Human Dimension Capabilities Development Task Force, *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative* (Fort Leavenworth, KS: Mission Command Center of Excellence, September 2015).
[211] *Ibid.,* 33-36.
[212] *Ibid.,* 31-33.

> "The ability to understand [cognitive component] the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act [behavioral component] appropriately upon that understanding."[213]

Many of the behavioral components in such conceptualizations are the product of personality traits or affective dimensions that are largely hard-wired into us from an early age.[214] These components are difficult to change over time. The more cognitive components, however, are learned later in life and therefore may be subject to change or improvement through training, education, and experience. It seems appropriate, then, that cognitive components should be the focus of SI training modules.

Developing Social Intelligence for the Army

Such an approach would require the Army to identify an existing model of SI or develop its own based on the lessons of the literature. Ideally, any model of SI employed by the US Army would enumerate the cognitive abilities of SI that are particularly critical for individual and team success in the Army. In some ways the Army has already identified various interpersonal and intrapersonal skills it considers essential for its personnel, many of which are similar or related to components of SI. Rather than couched in an explicit model of SI, however, the Army has identified these characteristics and skills elsewhere, most notably in the ADRP 6-22[215,216] One approach to improving SI in the Army therefore is to adopt or design training and education that targets these distinct components, which may in turn develop SI in Army personnel. Many of the sub-components of SI can also be considered elements of basic social skills, which Riggio argues are "learned communication abilities" and it is thereby "reasonable to expect that people can develop and enhance them."[217]

The Army's University of Foreign Military and Cultural Studies (UFMCS) curriculum already addresses many of the elements that make up conceptualizations of SI. Their Applied Critical Thinking Handbook (formerly known as the Red Teaming Handbook) outlines four major area that the UFMCS focuses on within their curriculum: (1) self-awareness and reflection, (2) groupthink mitigation and decision support, (3) critical thinking, and (4) fostering cultural empathy. These are briefly described in Figure 14.

---

[213] Herbert A. Marlowe, Jr. "Social Intelligence: Evidence for Multidimensionality and Construct Independence," *Journal of Educational Psychology* 78, no. 1 (1986): 52.
[214] Craig R. Seal, Richard E. Boyatzis, and James R. Bailey, "Fostering Emotional and Social Intelligence in Organizations," *Organization Management Journal* 3, No. 3 (2006): 198.
[215] Department of the Army, *ADRP 6-22: Army Leadership*, August 2012, 1-4 – 1-5.
[216] These include "mental agility," "empathy," "self-control," "emotional factors," "balance," "stability," "active listening," and "interpersonal tact".
[217] Riggio, "Assessment of Basic Social Skills," 659.

UFMCS Focus Area	Description
Self awareness and reflection	• Understanding how our values and beliefs affect how we think and decide and how that differs for others. • Sub-elements include: personal reflection, personality dimensions, daily journaling.
Groupthink mitigation and decision support	• The challenges inherent in hierarchical environments and elite teams - groups which might value maintaining social relationships more than making a tough decision. • Use of fungible, small group techniques to mitigate groupthink: use of anonymous feedback, liberating structures, etc. • How to connect critical thinking to operational design, problem framing, assumption validation, assessment tools, and MDMP.
Critical thinking	• Support for planning and decision making - deconstructing arguments, examining analogies, challenging assumptions, and exploring alternatives. • The role of intuition, thinking meta-cognitively, and enabling graduates to understand how humans think, and how culture shapes thoughts.
Fostering cultural empathy	• Developing better questions about culture, in order to facilitate strategic and operational decisionmaking which is informed by cultural empathy. • Tools to help understand foreign cultural contexts, and to foster empathy.

Figure 14. Major focus areas for UFMCS.[218]

All of these UFMCS curriculum components have direct links to SI. Self-awareness and reflection are explicit and major dimensions of many models of SI. Self-awareness can be considered part of the social perception domain of SI that allows individuals to better understand their role in specific social situations and then reflect on what actions might best serve their or their team's interests. Groupthink mitigation and decision support are both linked to the systems perception component of SI that the BDMSI suggested was so important to individual SI in organizational contexts. While self-awareness, empathy, and reflection may help an individual *perceive* the emotions and intent of themselves and others, it is critical thinking of available courses of action and reaction that will guide them to appropriate behavior. Finally, fostering cultural empathy in some ways is more specific than the other components; however, it is also critical to SI. Of course, SI is necessary for cross-cultural interactions, but it is also necessary for social interaction of any kind. In this regard, the empathy portion of UFMCS's focus on cultural empathy is critical. Empathy allows individuals to better assess the mental states of others in social situations and appreciate how your behavior may influence that mental state, which in turn affects the outcome of interaction.

Though not explicitly addressing SI, the UFMCS focuses on many of the same concerns of what SI consists of. Considering the dearth of rigorous empirical research on SI programs, it may serve the Army's interest in SI if it were to use the targeted curriculum that the UFMCS has developed and apply it more broadly to its personnel in order to develop their SI.

An additional consideration of developing interpersonal and intrapersonal skill that are critical to SI is that they are better learned through what some consider nontraditional methods of teaching. For instance, in their discussion of how to foster SI and EI in organizations, Seal, Boyatzis, and Bailey state "development of these types of skills is

[218] University of Foreign Military and Cultural Studies, *The Applied Critical Thinking Handbook*, 7.0, January 2015, 9-10.

generally done through a de-emphasis of lectures and an emphasis or focus on case studies, role-plays, and experiential exercise methodologies that incorporate reflection."[219] Importantly, the UFMCS embraces these approaches.

The concerns of the fundamentally different nature of learning SI skills (as opposed to rote memorization of historical facts or rules of grammar) also mirrors lessons from such nontraditional approaches to education as Kolb's Experiential Learning Theory (ELT).[220] In short, ELT provides the architecture for understanding how people learn from experience. ELT supposes that experience forms the foundation for four modes of learning, which comprise a cycle: 1) feeling, 2) reflecting, 3) thinking, and 4) acting. With that, ELT proposes that knowledge is best learned in a context in which it is meaningful and in which it can be applied so that the learner can immediately and directly see the correlation between new knowledge and other critical information that they already possess.[221]

Similarly, some scholars point to the difference between an *incremental* theory of human behavior and an *entity* theory of human behavior.[222,223] Incremental theories argue that variations in an individual's behavior is a result of their awareness of the unique requirements of that particular situation. Here, they assess the norms or necessities of that situation and act accordingly to the best of their ability (this is very similar to multidimensional conceptualizations of SI that include social perceptiveness and behavioral effectiveness). On the other hand, entity theories assume that people act consistently across situations, regardless of their requirements. In the realm of SI, one would assume a person with high SI would adhere to the incremental theory of behavior while a person with lower SI may endorse the entity theory. Another theory-based approach to improving SI, therefore, would be to encourage individuals through training and education to migrate their thinking from an entity theory of behavior to an incremental theory of behavior.

The "soft skills" that make up so much of SI often require a higher order of learning and understanding before they can be implemented, which is fundamentally different from rote learning of more basic tasks or skills. The theories cited here account for that higher order learning—the ELT cycle or the shift from entity to incremental behavior, for

[219] Seal, *et al*., "Fostering Emotional and Social Intelligence in Organizations," 202.
[220] Kolb's Experiential Learning Theory was discussed in a previous white paper: Human Dimension Capabilities Development Task Force, Cross-Cultural Competence: Overview of Cross-Cultural Training Theory and Practice for the Army, (Fort Leavenworth, KS: Mission Command Center of Excellence, September 2015): 17-18.
[221] Martha L. Maznevski and Joseph J. DiStefano, "Global Leaders Are Team Players: Developing Global Leaders Through Membership on Global Teams," *Human Resource Management* 39, nos. 2 & 3 (Summer/Fall 2000), 202.
[222] Carla A. Hackworth and Laura A. Brannon, "Understanding and Managing Others: The Impact of Social Intelligence Upon Social Influence," Communication Research Reports 23, No. 3 (2006): 177.
[223] Fischman, "Methods of Teaching Social Intelligence and Its Impact on Service Quality," 22.

instance—and serve to illuminate the diversity and complexity of methods that are necessary to developing such skills that relate to SI.

Conclusion and Recommendations

The US Army's interest in the Human Dimension requires critical consideration of extant research on measuring and developing SI in individuals. The review presented here illustrates a substantial and evolving body of literature on the subject that can help guide the Army. While an important takeaway is the lack of any pre-existing, all-in-one programs for measuring or developing SI, a number of key lessons emerge that can benefit the Army's Human Dimension initiative as it continues to investigate and develop efforts to address its interest in SI and prepare for the complex and changing OE of the future. The discussion presented here on approaches to measure and improve SI can be summarized in four key points.

First, the design of SI measures often dictates their utility for a given population or purpose. In this sense, the context of the test questions (socially-specific vs. socially-general, for example) matter greatly, as does its linkage to specific job tasks and organizational outcomes. A test intended for a specific Army leadership cohort looks much different than one intended for all new Army recruits. For instance, the BDMSI was developed for the US Army Special Forces, with specific tasks and outcomes related to their mission and purpose that might be influenced by SI in mind. On the other hand, the TSIS and MTSI were both developed for more general purposes. Each approach to measuring to SI is valuable, but each serves a different purpose.

Second, SI assessments should reflect the multidimensional nature of SI. Most scholars now agree that SI is a multidimensional construct that consists of cognitive and behavioral components. Adopting or acknowledging a multidimensional definition of SI, which we propose, can partially address this concern. Ideally, a test of SI would consist of multiple subtests to be able to accurately measure both components and thereby create a composite SI factor. As the literature reveals, however, this is a complex endeavor and has so far proved difficult. If a multidimensional measure of SI is impracticable, any test the Army considers ought to be couched in a multidimensional conceptualization or theoretical framework of SI and expressly state which component(s) of SI it is addressing.

Third, the format of the SI measurement test is important. Each format has strengths and weaknesses that need to be acknowledged and accounted for in the test design. MTMM designs that incorporate multiple formats to offset potential variance caused by any single format have emerged as promising and scientifically rigorous measures of SI. Furthermore, nonverbal measures are believed to be especially critical to assessing SI so that the construct is not conflated with traditional measures of IQ that rely largely on written questions and answers. A promising development in this regard is the increased

use of a variety of more advanced and increasingly more available multimedia platforms that can be cheaply incorporated in the testing process (video and computer simulations, for instance).

Finally, the lack of empirical research supporting any specific measure of SI prevents any similar claims of the effectiveness of SI development programs. Without any meaningful measure of SI, development tools or education programs intended to improve SI will remain problematic. However, the multidimensional approach to SI may facilitate developing components of SI where attempts to develop SI as a whole prove challenging. In this case, the most logical approach to training or developing SI is to target specific interpersonal and intrapersonal skills that are suggested as elements of SI and also considered critical to individual and team success for the Army. These might social awareness, self-awareness, organizational/systems awareness, and empathy, for instance. Many of these are established concepts in the literature outside of SI and have attendant development and training programs. The Army's own UFMCS is addressing many of these components in their curriculum that may serve the Army's interest to improve it among their personnel more broadly.

With these observations in mind, as well as the literature reviewed here and in the previous two white papers on SI, the HDCDTF provides the following recommendations to the Army:

(1) Adopt Marlowe's multidimensional conceptualization as the Army's working definition of SI:

> *The ability to understand the feelings, thoughts, and behaviors of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding.*[224]

(2) Consider revisiting and testing Zaccaro *et al*'s Background Data Measure of Social Intelligence (BDMSI) among Army personnel to determine if it is feasible and effective to possibly expand to broader groups of personnel and integrate in the Army's Human Dimension initiative. Also consider testing, adopting, or amending the following SI measurement tools to satisfy specific or general SI measurement needs in the Army that the BDMSI may not be able to address:
    - Tromsø Social Intelligence Scale (TSIS)
    - Magdeburg Test of Social Intelligence (MTSI)
    - The Interpersonal Perception Task-15 (IPT-15)
    - Schneider and Johnson's Social Knowledge Test (SKT)
    - Riggio's Social Skills Inventory (SSI)

[224] Marlowe, Jr. "Social Intelligence," 52.

(3) Integrate UFMCS curriculum and expertise on interpersonal and intrapersonal skills relating to SI (for instance, self awareness, reflection, critical thinking, decision support, and empathy) into the testing procedures of the mechanisms above in order to validate the tool and expand its use within the Army. The intent would be to measure an individual's SI (according to the tools cited above) before and after enrollment in relevant UFMCS courses to determine if they had any effect on their SI.

References

Ackerman, Phillip and Eric D. Heggestad. "Intelligence, Personality, and Interests: Evidence for Overlapping Traits." Psychological Bulletin 12, no. 2 (March 1997): 219-245.

Adetula, Gabriel Agboola. "Emotional, Social, and Cognitive Intelligence as Predictors of Job Performance Among Law Enforcement Agency Personnel." Journal of Applied Security Research 11, No. 2 (2016): 149-165.

Antonakis, John, Neal M. Ashkanasy, and Marie T. Dasborough. "Does Leadership Need Emotional Intelligence?" *The Leadership Quarterly* 20 (2009): 247-261.

Austin, Elizabeth, and Donald H. Saklofske. "Far Too Many Intelligences? On The Commonalities and Differences Between Social, Practical, and Emotional Intelligences." In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts, 107-128. Cambridge, MA: Hogrefe & Huber Publishers, 2005.

Barchard, Kimberly Anne. "Emotional and Social Intelligence: Examining Its Place in the Nomological Network." Doctoral dissertation, The University of British Columbia, August 2001.

Bartone, Paul T., Jarle Eid, Bjorn Helge Johnsen, Jon Christian Laberg, and Scott A. Snook. "Big Five Personality Factors, Hardiness, and Social Judgment as Predictors of Leader Performance." *Leadership & Organization Development Journal* 30, No. 6 (2009): 498-521.

Bjorkvist, Kaj, Karin Osterman, and Ari Kaukiainen. "Social Intelligence — Empathy = Aggression?" *Aggression and Violent Behavior* 5, no. 2 (2000): 191-200.

Boyatzis, Richard E. "How and Why Individuals Are Able to Develop Emotional Intelligence." In *The Emotionally Intelligent Workplace*, edited by C. Cherniss and Goleman, 234-253 (San Francisco, CA: Jossey-Bass), 2001.

Boyatzis, Richard E. "Competencies in the 21st Century." *Journal of Management Development* 27, no. 1 (2008): 5-12.

Campbell, Jonathan M., and David M. McCord. "The WAIS-R Comprehension and Picture Arrangement Subtests as Measures of Social Intelligence: Testing Traditional Interpretations." *Journal of Psychoeducational Assessment* 14 (1990): 240-249.

Cantor, Nancy, and John F. Kihlstrom. *Personality and Social Intelligence.* Englewood Cliffs, NJ: Prentice-Hall, 1987.

Cantor, Nancy, and John F. Kihlstrom. "Social Intelligence: The Cognitive Basis of Personality." In *Self, Situations, and Social Behavior: Review of Personality and Social Psychology*, edited by Phillip Shaver, 15-33. Beverly Hills, CA: Sage Publication, 1985.

Chapin, F. Stuart. "Preliminary Standardization of a Social Insight Scale." *American Sociological Review* 7, No.2 (1942): 214-225.

Conzelmann, Kristin, Susanne Weis, and Heinz-Martin Suss. "New Findings About Social Intelligence: Development and Application of the Magdeburg Test of Social Intelligence (MTSI)." *Journal of Individual Differences* 34, No. 3 (2013): 119-137.

Crowne, Kerri. "The Relationships Among Social Intelligence, Emotional Intelligence, and Cultural Intelligence." *Organization Management Journal* 6 (2009): 148-163.

Delič, Lara, Petra Novak, Jan Kovačič, and Andreja Avsec. "Self-reported Emotional and Social Intelligence and Empathy as Distinctive Predictors of Narcissim." *Psychological Topics* 20, No. 3 (2011): 477-488.

Department of the Army. *ADRP 6-0: Mission Command*. May 2012.

Department of the Army. *ADRP 6-22: Army Leadership*. August 2012.

Department of the Army. *Army Leadership Development Strategy (ALDS): Training, Education, Experience*. 2013.

Department of the Army. *The Army Human Dimension Strategy 2015: Building Cohesive Teams to Win In A Complex World: Cognitive Dominance, Realistic Training, Institutional Agility*. 2015.

Department of the Army. *The U.S. Army Human Dimension Concept*. TRADOC Pamphlet 525-3-7. May 21, 2014.

Department of the Army. *The U.S. Army Operating Concept: Win in a Complex World: 2020-2040.* TRADOC Pamphlet 525-3-1. October 31, 2014.

Dumitrescu, Alexandrina L., Daniela Badiță, Carmen Beatrice Dogaru, Carmen Toma, and Carmen Duță. "The Association o Social Desirability and Social Intelligence with Smoking Among Undergraduates." *Procedia—Social and Behavioral Science* 159 (2014): 552-556.

Fischman, Martin B. "Methods of Teaching Social Intelligence and Its Impact on Service Quality," Master's thesis, University of Illinois at Urbana-Champagne, 2010.

Ford, Martin E., and Marie S. Tisak. "A Further Search for Social Intelligence." *Journal of Educational Psychology* 75, no. 2 (1983): 196-206

Goleman, Daniel, and Richard Boyatzis. "Social Intelligence and the Biology of Leadership." *Harvard Business Review* (September 2008): 2-7.

Hackworth, Carla A., and Laura A. Brannon."Understanding and Managing Others: The Impact of Social Intelligence Upon Social Influence." Communication Research Reports 23, No. 3 (2006): 171-178.

Hedlund, Jennifer, and Robert J. Sternberg. "Too Many Intelligences? Integrating Social, Emotional, and Practical Intelligence." In *The Handbook of Emotional Intelligence:*

Theory, Development, Assessment, and Application at Home, School, and in the Workplace, edited by Reuven Bar-On and James D.A. Parker, 136-167. San Francisco: Jossey-Bass, 2000.

Hoffman, Brian J., and Brian C. Frost. "Multiple Intelligences of Transformational Leaders: An Empirical Examination." *International Journal of Manpower* 27, no. 1 (2006): 37-51.

Human Dimension Capabilities Development Task Force. *Social Intelligence: Introduction and Overview for the Army's Human Dimension Initiative.* Fort Leavenworth, KS: Mission Command Center of Excellence (MCCOE), United States Army Combined Arms Center, February 2016.

Human Dimension Capabilities Development Task Force. Social Intelligence and Emotional Intelligence: A Literature Review of Their Similarities and Differences. Fort Leavenworth, KS: Mission Command Center of Excellence, May 2016.

Human Dimension Capabilities Development Task Force, *Cultural Interoperability: Applying Social Categorization to Better Understand and Mitigate Cultural Friction in Multinational Operations*. Fort Leavenworth, KS: Mission Command Center of Excellence, January 2016

Human Dimension Capabilities Development Task Force. *Cross-Cultural Competence: Introduction and Overview of Key Concepts*. Fort Leavenworth, KS: Mission Command Center of Excellence, April 2015.

Human Dimension Capabilities Development Task Force. *Cross-Cultural Competence: Review of Assessment Methodology and Available Assessment Tools*. Fort Leavenworth, KS: Mission Command Center of Excellence, June 2015.

Human Dimension Capabilities Development Task Force. *Cross-Cultural Competence: Overview of Cross-Cultural Training Theory and Practice for the Army.* Fort Leavenworth, KS: Mission Command Center of Excellence, September 2015.

Jones, Karen, and Jeanne D. Day. "Discrimination of Two Aspects of Cognitive-Social Intelligence from Academic Intelligence." Journal of Educational Psychology 89, No. 3 (1997): 486-497.

Judge, Timothy A., Amy E. Colbert, and Remus Ilies. "Intelligence and Leadership: A Quantitative Review and Test of Theoretical Propositions." Journal of Applied Psychology 89, no. 3 (June 2004): 542-552.

Kang, Sun-Mee, Jeanne D. Day, and Naomi M. Meara. "Social and Emotional Intelligence: Starting a Conversation about Their Similarities and Differences." In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts, 91-105. Cambridge, MA: Hogrefe & Huber Publishers. 2005.

Keating, Daniel P. "A Search for Social Intelligence." Journal of Educational Psychology 70, no. 2 (April 1978): 218-223.

Kihlstrom, John F., and Nancy Cantor. "Social Intelligence." In *Handbook of Intelligence*, edited by Robert J. Sternberg, 359-379. New York, NY: Cambridge University Press, 2000.

Kinga, Szabo, and Kotta Ibolya. "The Predictive Value of Social Intelligence for Cooperative Behavior in a Task-Oriented Interaction Paradigm: A Pilot Study." *Transylvanian Journal of Psychology* 14, No. 2 (2013): 255-274.

Landy, F. "The Long, Frustrating, and Fruitless Search for Social Intelligence: A Cautionary Tale." In *A Critique of Emotional Intelligence: What Are the Problems and How Can They Be Fixed?,* edited by Kevin R. Murphy, 81-123, (Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 2006)

Landy, Frank J. "Some Historical and Scientific Issues Related to Research on Emotional Intelligence." *Journal of Organizational Behavior* 26 (2005): 411-424.

Lee, Jong-Eun, Chau-Ming T. Wong, Jeanne D. Day, Scott E. Maxwell, and Pamela Thorpe. "Social and Academic Intelligences: A Multitrait-Multimethod Study of Their Crystallized and Fluid Characteristics." *Personality and Individual Differences* 29 (2000): 539-553.

Lievens, Filip, and David Chan. "Practical Intelligence, Emotional Intelligence, and Social Intelligence." In *Handbook of Employee Selection*, edited by James L. Farr and Nancy T. Tippins, 339-360. New York: Lawrence Erlbaum/Taylor & Francis, 2010.

Marlowe, Herbert A., Jr. "Social Intelligence: Evidence for Multidimensionality and Construct Independence." *Journal of Educational Psychology* 78, no. 1 (1986): 52-58.

Matthews, Gerald, Moshe Zeidner, and Richard D. Roberts. "Appendix A: A Review and Critique of Social Intelligence." In *Emotional Intelligence: Science and Myth,* by Gerald Matthews, Moshe Zeidner, and Richard D. Roberts, 551-561. Cambridge, MA: MIT Press, 2002.

Matthews, Gerald, Moshe Zeidner, and Richard D. Roberts. E*motional Intelligence: Science and Myth.* Cambridge, MA: MIT Press, 2002.

Maznevski, Martha, and Joseph J. DiStefano. "Global Leaders Are Team Players: Developing Global Leaders Through Membership on Global Teams." *Human Resource Management* 39, nos. 2 & 3 (Summer/Fall 2000), 195-208.

Meijs, Noortje, Antonius H.N. Cillessen, Ron H.J. Scholte, Eliane Segers, and Renske Spijkerman. "Social Intelligence and Academic Achievement as Predictors of Adolescent Popularity." Journal of Youth and Adolescence 39 (2010): 62-72.

Orchard, Benjamin, Carolyn MacCann, Ralf Schulze, Gerald Matthews, Moshe Zeidner, and Richard D. Roberts. "New Directions and Alternative Approaches to the Measurement of Emotional Intelligence." In *Assessing Emotional Intelligence: Theory, Research, and Practice*, edited by Con Stough, Donald H. Saklofske, and James D.A. Parker. New York: Springer Science+Business Media, LLC, 2009. 321-344.

Riggio, Ronald E. "Assessment of Basic Social Skills." Journal of Personality and Social Psychology 51, no. 3 (September 1986): 649-660.

Riggio, Ronald E., and Joanne Lee. "Emotional and Interpersonal Competencies and Leader Development." *Human Resource Management Review* 17 (2007): 418-426.

Riggio, Ronald E., and Rebecca J. Reichard. "The Emotional and Social Intelligences of Effective Leadership: An Emotional and Social Skill Approach." *Journal of Managerial Psychology* 23, no. 3 (2008): 169-185.

Roberts, Richard D., Gerald Matthews, and Moshe Zeidner. "Emotional Intelligence: Muddling Through Theory and Measurement." *Industrial and Organizational Psychology* 3, no. 2 (June 2010): 140-144.

Romney, David M., and Michael C. Pyryt. "Guilford's Concept of Social Intelligence Revisited." High Abilities Studies 10, No. 2 (1999): 137-142.

Schneider, Robert J., and Jeff W. Johnson. *Direct and Indirect Predictors of Social Competence in United States Army Junior Commissioned Officers*. Technical Report 1171. United States Army Research Institute for the Behavioral and Social Sciences. November 2005.

Schneider, Robert J., Phillip L. Ackerman, and Ruth Kanfer. "To 'Act Wisely in Human Relations:' Exploring The Dimensions of Social Competence." *Personality and Individual Differences* 21, no. 4 (1996): 469-481.

Seal, Craig, Richard E. Boyatzis, and James R. Bailey. "Fostering Emotional and Social Intelligence in Organizations." *Organization Management Journal* (Linking Theory & Practice: EAM White Papers Series) 3, no. 3 (2006): 190-209.

Shanley, Luke A., Ronald E. Walker, and Jeanne M. Foley. "Social Intelligence: A Concept in Search of Data." Psychological Reports 29 (1971): 1123-1132.

Shuffler, Melissa, Heidi Keller-Glaze, Beret Strong, William S. Weyrauch, Jessica Jenkins, Jonathan Bryson, and Kimberly A. Metcalf. *Organizational Social Effectiveness: An Annotated Bibliography*. Research Product 2014-03. United States Army Research Institute for the Behavioral and Social Science. January 2014.

Silvera, David H., Monica Martinussen, and Tove I. Dahl. "The Tromsø Social Intelligence Scale, a Self-Report Measure of Social Intelligence." *Scandinavian Journal of Psychology* 42 (2001): 313-319.

Sipps, Gary J., William Berry, and Eileen M. Lynch. "WAIS-R and Social Intelligence: A Test of Established Assumptions That Uses the CPI." *Journal of Clinical Psychology* 43, no. 5 (1987): 499-504.

Sternberg, Robert J. "A Broad View of Intelligence: The Theory of Successful Intelligence." *Consulting Psychology Journal: Practice and Research* 55, no.3 (Summer 2003): 139-154.

Thorndike, Edward L. "Intelligence and Its Uses." *Harpers Monthly Magazine* 140 (1920): 227-235.

University of Foreign Military and Cultural Studies, *The Applied Critical Thinking Handbook (Formerly the Red Team Handbook)*, 7.0, January 2015.

Walker, Ronald E., and Jeanne M. Foley. "Social Intelligence: Its History and Measurement." *Psychological Reports* 33 (1973): 839-864.

Weis, Susanne. "Theory and Measurement of Social Intelligence as a Cognitive Performance Construct." Doctoral dissertation, Universität Magdeburg. January 21, 2008.

Weis, Susanne, and Heinz-Martin Süß. "Reviving the Search for Social Intelligence—A Multitrait-Multimethod Study of its Structure and Construct Validity." *Personality and Individual Differences* 42 (2007): 3-14.

Weis, Susanne, and Heinz-Martin Süß."Social Intellience—A Review and Critical Discussion of Measurement Concepts." In *Emotional Intelligence: An International Handbook*, edited by Ralf Schulze and Richard D. Roberts, 203-230. Cambridge, MA: Hogrefe & Huber Publishers, 2005.

Wong, Chau-Ming T., Jeanne D. Day, Scott E. Maxwell, and Naomi M. Meara. "A Multitrait-Multimethod Study of Academic and Social Intelligence in College Students." Journal of *Educational Psychology* 87, no. 1 (1995): 117-133.

Zaccaro, Stephen J., Janelle A. Gilbert, Michelle M. Zazanis, and Marisa Diana, *Investigating a Background Data Measure of Social Intelligence*. Technical Report 1024. United States Army Research Institute for the Behavioral and Social Sciences, March 1995.

Zaccaro, Stephen J. *Models and Theories of Executive Leadership: A Conceptual/Empirical Review and Integration*. United States Army Research Institute for the Behavioral and Social Sciences, October 1996.

Zaccaro, Stephen J., Deanna Banks, Lee Kiechel-Koles, Cary Kemp, and Paige Bader. *Leader and Team Adaptation: The Influence and Development of Key Attributes and Processes*. Technical Report 1256. United States Army Research Institute for the Behavioral and Social Sciences, August 2009.

Zeidner, M., G. Matthews, and R.D. Roberts. "Emotional Intelligence in the Workplace: A Critical Review." *Applied Psychology: An International Review* 53 (2004): 371-399