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Utilizing the Army Talent Attribute Framework to Develop Measurement Plans and Specifications

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14. ABSTRACT

Throughout the Army People Strategy (2019), measurement plays an essential role in capturing the knowledge, skills, abilities, and other characteristics (KSAOs) critical for success in acquiring, developing, employing, and retaining talent. The Army Talent Attribute Framework (ATAF) constituted a major talent management advancement outlining the KSAO domain through an Army-wide job analysis (Royston et al., 2022). However, its introduction highlighted another critical need: identifying valid and reliable assessments capable of measuring these KSAOs. The objective of this research note is to equip Army talent management professionals with an overview of how the ATAF can facilitate the assessment planning and specifications process that meet the requirements for the intended use. We describe the steps of identifying important tasks and duties; linking them to ATAF attributes; selecting, adapting, and developing measures; and creating measurement plans and specifications. To this end, we conducted a systematic review of academic, commercial, governmental, and public sources, identifying 69 evidence-based assessments that could be used to assess the top 30 Officer KSAOs identified in the Army-wide job analysis (Royston & Lin, 2022). Army talent management professionals can use this resource as a starting point for assessment planning. We also discuss several directions for future work in the Army, including assessment development opportunities, the potential of predictive analytics and modeling techniques, and addressing measurement tradeoffs.

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KSAO, Army Talent Attribute Framework, Measurement Plan, Test Specification, Talent Management, Army Measures Compendium

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UTILIZING THE ARMY TALENT ATTRIBUTE FRAMEWORK TO DEVELOP MEASUREMENT PLANS AND SPECIFICATIONS

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), in collaboration with the Army Talent Management Task Force (ATMTF), conducted an Army-wide job analysis for officers. The purpose of this effort was to identify the knowledge, skills, abilities, and other characteristics (KSAOs) critical for ensuring Army readiness in talent management. The results of this collaboration included the introduction of the Army Talent Attribute Framework (ATAF), a comprehensive, unifying, and hierarchical list of Army KSAOs. Ensuing from this work, the identification of evidence-based measures of ATAF KSAOs was recognized as a critical need for Army talent management. In support, the current research provides a broad overview of the measurement planning and specifications development process. Furthermore, the current research presents initial work toward developing an *Army Measures Compendium* (AMC), a resource containing evidence-based measures of Army KSAOs.

Procedure:

In the first stage, ARI personnel developed a high-level tutorial of the measurement planning and specifications process including best practices. In the second stage, a systematic review of academic, commercial, governmental, and public sources was conducted to identify measures for inclusion in the AMC. The systematic review began with establishing the purpose, scope, exclusion criteria, and coding scheme. Next, ARI personnel began their structured search of the measure sources, targeting academic databases, commercial vendors, governmental research repositories, and public domain item repositories. In addition, ARI personnel reconciled their efforts with other Army organizations engaged in similar work. This search resulted in a preliminary collection of 144 measures. These measures were further evaluated and sifted, considering context and purpose, validity and reliability evidence, content relevance, and construct correspondence as criteria.

Findings:

The overview of the measurement planning and development process outlined the following steps in the process: identifying important tasks and duties; linking tasks and duties to attributes; selecting, adapting, or developing measures; implementing the measurement plan through specifications. In this tutorial, we outline the key factors and considerations Army talent management professionals should be cognizant of in the careful process of selecting measures for talent management purposes. In the second stage of our work, we identified 69 potential measures of the top 30 KSAOs that were rated as most important for officers, Army-wide. We also identified opportunities for measure development or adaptation, including two situations in which we were unable to identify a suitable measure of the KSAO.

Utilization and Dissemination of Findings:

Army talent management professionals can utilize the overview of the measurement planning and specifications process, as well as the initial AMC, to aid in the selection of Army KSAOs in the ATAF. They can draw upon the steps of the planning process reviewed, including key considerations and best practices, for developing their own measurement plans and specifications. We provide several illustrative tools that Army talent management professionals can use to aid their decision making, including the construction of linkage matrices and attribute by measure matrices. We describe a key decision point in the measurement planning process (e.g., deciding between selecting, adapting, or developing measures), and equip Army talent management professionals with guidelines and options for how to approach each option. Finally, we provide additional sources of information for those looking for further guidance. Moreover, Army talent management professionals can use the AMC as a starting point for selecting measures for use in their own measurement planning efforts. Furthermore, the results of our systematic review can be used as a catalyst for measurement development and improvement efforts within the Army, including developing additional measures of KSAOs, leveraging predictive analytics and modeling to improve processes, and addressing measurement tradeoffs in talent management research and practice.

UTILIZING THE ARMY TALENT ATTRIBUTE FRAMEWORK TO DEVELOP MEASUREMENT PLANS AND SPECIFICATIONS

CONTENTS

APPENDICES

LIST OF TABLES

Page

LIST OF FIGURES

Utilizing the Army Talent Attribute Framework to Develop Measurement Plans and Specifications

The Army People Strategy (2019) outlines several Lines of Effort (LOEs) to achieve the Army's strategic talent management objectives, including acquiring, developing, employing, and retaining talent. Throughout these LOEs, measurement of critical and important knowledge, skills, abilities, and other characteristics (KSAOs) plays a critical role.[1] The recent introduction of the Army Talent Attribute Framework (ATAF; Royston et al., 2022), shown in Figure 1, produced a unified taxonomy of 195 KSAOs[2] that established the attributes most important to successful performance across all positions (i.e., officers, warrant officers [WOs], noncommissioned officers [NCOs]) in the Army (Royston & Lin, 2022). Building upon this work, the identification of appropriate *measures* of KSAOs is a critical need for Army personnel, so that they are equipped with the right information and tools to guide talent management decisions.[3] These measures can be leveraged to identify talent gaps, improve screening and acquisition processes, and facilitate the training and development of Army personnel.

The purpose of this effort is to demonstrate how the ATAF can be used as a foundation for developing measurement plans and specifications for various talent management purposes. First, we describe the overall measurement plan and specification development process to inform Army personnel of the best practices and considerations for measurement in talent management. This includes the process of identifying important tasks and duties; linking tasks and duties to attributes within the ATAF; selecting, adapting or developing measures within a measurement plan; and implementing the measurement plan through test specification. Next, we describe the

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[1] The scientifically accepted delineation of human attributes within industrial/organizational psychology and related fields is Knowledge, Skills, Abilities, and Other characteristics (KSAOs). The use of KSAO (or KSA) has been the accepted terminology in Army publications prior to Wardynski et al. (2009). Beginning with Wardynski et al. (2009), a series of publications authored by Office of Economic and Manpower Analysis (OEMA) articulated the possibility of transforming approaches to officer personnel management and began using the term "Knowledge, Skills, and Behaviors (KSB)," and sometimes added "Preferences" (KSB-P). To be consistent with accepted industry and scientific practice, we use the term KSAO when referring to the broader literature on psychological characteristics related to performance. When discussing more generally the superordinate universe of potential KSAOs and KSBs that span both Army-specific and civilian work contexts, we will refer to the general term of "attributes" or "attributes and characteristics."

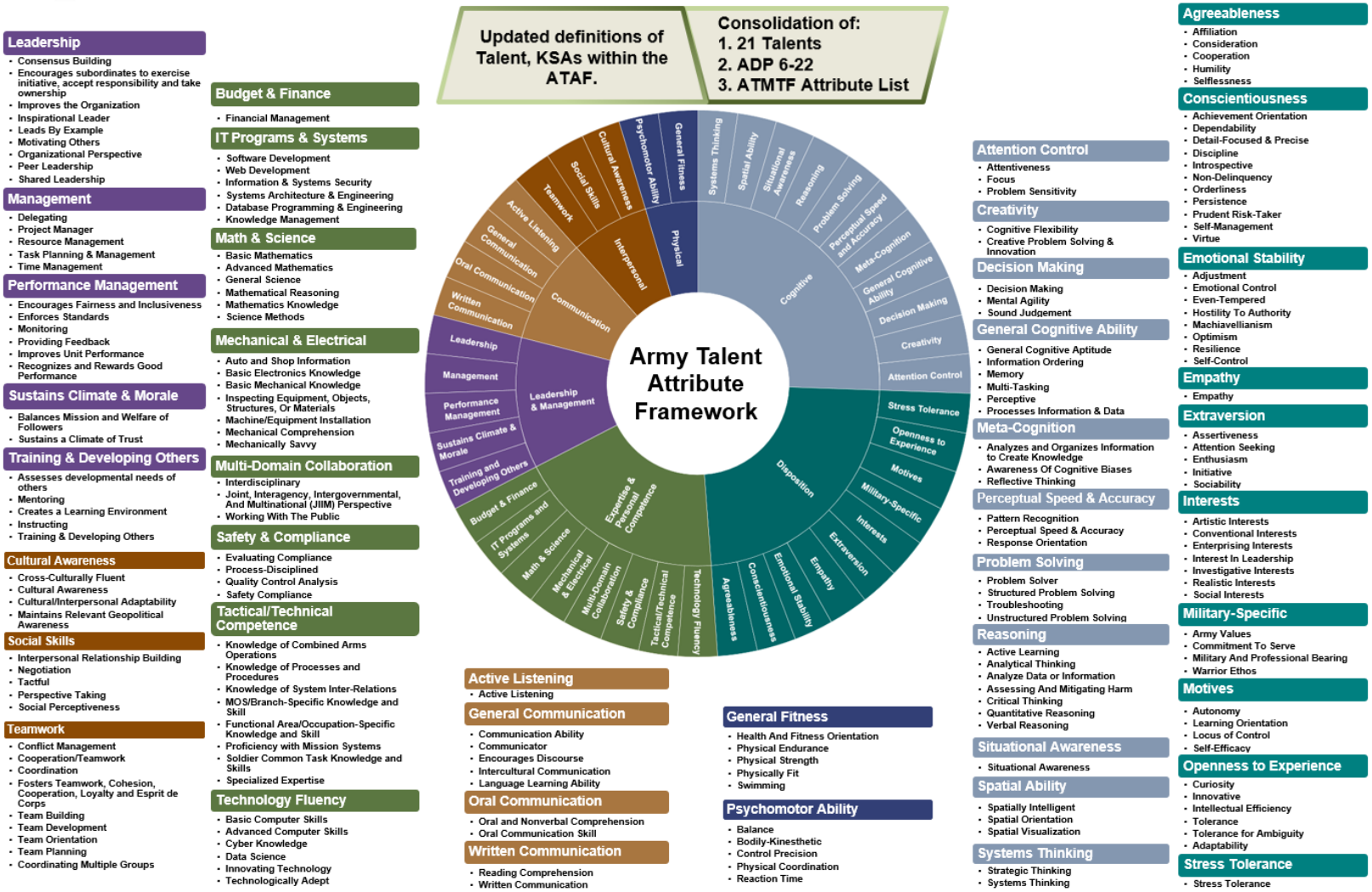
[2] The ATAF was initially composed of 198 KSAOs, but as part of ensuring an up-to-date and relevant framework, the Army Talent Management Taskforce (ATMTF) has planned a yearly review cycle in which the ATAF and KSAOs are refined and revised based on new data and changes in the workplace. Following the annual review cycle for FY22, the ATAF now consists of 195 Tier 3 KSAOs and 43 Tier 2 Talents.

[3] Throughout this report, we follow the standard terminology used by the U.S. Equal Employment Opportunity Commission's (EEOC) *Uniform Guidelines on Selection Procedures* (EEOC, 1978) and the Society of Industrial and Organizational Psychology (SIOP) *Principles for the Validation and Use of Personnel Selection Procedures*, in which the terms, "selection procedure", "test", "predictor", and "assessment" are used interchangeably (SIOP, 2018, p. 3). The *Principles* defines assessment as "any systematic method of obtaining information from tests and other sources used to draw inferences about characteristics of people" (p. 46). Further, "measure" is another synonym in the *Principles'* definition of "test" as "a measure or procedure in which a sample of an examinee's behavior in a specified domain is obtained, evaluated, and scored using a standardized process" (p. 48). Regardless of whether assessments or measures are used in making selection decisions or used in less formal, developmental settings, they should be carefully and thoughtfully developed and have been subject to rigorous validation procedures (e.g., DeVellis, 2012; Principles, 2018; U.S. Equal Employment Opportunity Commission, 1978; Zickar, 2020).

efforts of a systematic review (Madden et al., 2018; Siddaway et al., 2019) of available assessments that Army talent management professionals can draw upon. As a result, we introduce an *Army Measures Compendium* (AMC), a selection of assessments targeting the top 30 most important KSAOs for officers identified in the Army-wide job analysis effort (Royston & Lin, 2022) that can be used as a tool in developing measurement plans and specifications.

Figure 1

The Army Talent Attribute Framework



Note. Tier 1 Talent Domains are depicted in the inner circle, Tier 2 Talents are depicted in the outer circle, and Tier 3 measurable KSAOs are listed on the outside of circle. Adapted from Royston et al. (2022).

Developing Measurement Plans and Specifications

Talent management personnel balance several, sometimes competing, objectives when selecting measures (Russell & Peterson, 2007):

1. Maximize validity (e.g., Does the measure predict outcomes important to the Army, does the measure correspond with the attribute it is intended to assess, does the measure reflect the content domain of the job and attribute assessed, would the measure operate similarly in other contexts or situations?)
2. Maximize reliability (e.g., Do the items on the measure consistently produce similar scores, are results on one testing occasion similar to results on other occasions, are raters consistent in their responses to the assessment?)
3. Minimize adverse impact (e.g., Do the responses or scores from members of protected classes differ fundamentally from members of other classes, resulting in divergent outcomes of personnel decisions?)
4. Enhance efficiency (e.g., Is the measure cost-effective? Does the measure take a substantial amount of time to administer and score? Is the measure burdensome to complete?)

Therefore, selecting the best measures for each KSAO involves a process that seeks to balance these objectives. The outcome of this process is a *measurement plan* or *blueprint* that "summarizes information from a thorough job analysis and literature review" and "provides a rationale for tests and assessment methods that are chosen" (Russell & Peterson, 2007, p. 98). Following the development of the measurement plan, talent management personnel can develop a *measurement specification* that implements the measurement plan, outlining the logistical and operational details of each measure (e.g., the number of items, time restrictions, measure format, Russell & Peterson, 2007). The ATAF can be used as a foundation for establishing measurement plans and specifications, as it outlines the critical tasks and KSAOs needed for effective performance. In the sections that follow, we outline the steps in the process talent management professionals should take to arrive at effective measurement plans and specifications (Hughes & Prien, 1989).

Identifying Important Tasks and Duties

As noted in the prior section, the cornerstone for effective measurement plans is a thorough *job analysis* (Morgeson et al., 2020). Although there are numerous ways in which a job analysis can be conducted, these efforts often involve capturing the universe of tasks and duties that comprise any given job, as well as obtaining information on how frequently they are performed and how important they are to the work (Morgeson et al., 2020). Moreover, other job analysis techniques extend the focus of the investigation toward the worker to uncover the KSAOs instrumental to successfully accomplishing tasks and duties (Robinson-Morral et al., 2018).

As an illustration, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has recently conducted an Army-wide job analysis, outlining the universe of tasks and duties for officers, WOs, and NCOs. The task inventory approach was taken in this

effort, with branch/Functional Area (FA), area of concentration (AOC), and military occupational specialties (MOS) task and duty lists compiled from individual critical task lists (ICTLs). Moreover, importance ratings were collected from officer, WO, and NCO incumbents on the importance of each KSAO in the ATAF for successful performance in their particular job. These tasks and duties can serve as the basis for identifying the attributes required for successful performance for each of the tasks and duties as well.

Identifying Important Attributes from the Army Talent Attribute Framework

Once the task and duty lists are developed, the next step in the process is to identify critical attributes (i.e., KSAOs) that are associated with successful completion of each task and duty (e.g., Hughes & Prien, 1989; Robinson-Morral et al., 2018). This step can also be approached more holistically, such as the job-level KSAO importance ratings obtained in the Army-wide job analysis described earlier. Regardless, the chain of inference involves linking the actual content of the job (i.e., what Army personnel will actually be doing "in practice") with attributes that preclude success or failure on the job (Kane, 1997). The output from this step of the process often takes the form of a *linkage matrix* (Hughes & Prien, 1989; Robinson-Morral et al., 2018; Vinchur et al., 1993), in which subject matter experts (SMEs—often job incumbents) complete ratings of the importance of each KSAO for successfully performing each task or duty, resulting in a task-KSAO matrix. An example linkage matrix is shown in Table 1. These linkage matrices provide a method for visualizing the connection between tasks and KSAOs and serve as the basis for making determinations of which KSAOs to focus on in talent management decision-making (e.g., establishing an acquisition or selection system).

Table 1

Linkage Matrix Example

	KSAO 1	KSAO 2	KSAO 3	KSAO 4	KSAO 5	KSAO 6	KSAO 7	KSAO 8	KSAO 9	KSAO 10
Task 1	**X**						**X**			**X**
Task 2		**X**	**X**	**X**						
Task 3	**X**			**X**	**X**			**X**	**X**	
Task 4				**X**			**X**			
Task 5	**X**			**X**						
Task 6	**X**			**X**				**X**		
Task 7				**X**						
Task 8		**X**			**X**			**X**		**X**
Task 9			**X**	**X**						
Task 10	**X**									

Note. "**X"** refers explicitly to whether there is a link between a task and a KSAO. In practice, the cells of this matrix are often average importance ratings across multiple SMEs of the KSAO for the task. Depending upon the purpose of the effort, cutoff criteria can be set to determine which KSAOs are most critical for each task (Robinson-Morral et al., 2018).

Selecting, Adapting, or Developing Assessments that Assess Important Attributes

The next step directly informs the creation of the *measurement plan*. It involves compiling a set of assessments that assess the important attributes identified in the previous step. As noted earlier, the assessment selection process involves a balance between striving toward objectives of maximizing validity, reliability, and efficiency while minimizing adverse impact (Russell & Peterson, 2007). Moreover, there are situations in which a sufficient assessment of a particular KSAO is unavailable or impractical to use for a specific talent management purpose. Therefore, a discussion of various approaches to selecting, adapting, and developing assessments is appropriate along with a consideration of measurement quality and generalizability.

Selecting Assessments: The Importance of Reliability and Validity

When selecting assessments to inform talent management decisions,[4] it is critical to consider the accumulated reliability and validity evidence of each assessment (Allen & Yen,

[4] Assessments are used in a variety of employment settings and should be selected based on their intended use (e.g., selection, classification, development, diagnostic). While this report focuses on describing valid and reliable assessments suitable for higher stakes employment decisions (e.g., selection, classification), we emphasize the

1979; Guion, 2011; Nunnally & Bernstein, 1994). The *Standards for Educational & Psychological Testing* (2014)*, Principles for the Validation and Use of Personnel Selection Procedures* (2018), and *Uniform Guidelines on Employee Selection Procedures* (1978) all establish professional standards that emphasize the importance of reliability and validity for establishing the empirical basis of assessments.[5]

Reliability. Broadly speaking, *reliability* refers to "consistency in sets of measures" (Guion, 2011, p. 162) and a *reliability coefficient* is a statistic which "estimates the degree to which variance in a set of scores is systematic" (p. 163) and free from measurement error or inconsistency (Cho, 2016). As some examples, empirically sound assessments exhibit this quality of consistency among the items that comprise the assessment (e.g., *internal consistency* reliability, for example, as indexed by coefficient Alpha or other reliability measures),[6] over separate administrations of the measure (e.g., *test-retest* reliability, for example, as indexed by the test-retest correlation), and through consistency in how raters assess target individuals using a measure (e.g., *inter-rater reliability*, for example, as indexed by Cohen's Kappa).

Internal consistency reliability (e.g., coefficient Alpha) is one of the most commonly reported reliability coefficients in the social sciences. But how should one judge the magnitude of coefficient Alpha (ranging from 0 [no reliability evidence] to 1 [complete reliability evidence]) and determine whether sufficient reliability evidence exists for the measure in question? Although many benchmarks have been suggested over the last century, researchers have often suggested the following: .70 for initial measure development, .80 for use in research studies, .90 for clinical and operational settings, and .95 as the "ideal level" for measures (Nunnally & Bernstein, 1994; Yang & Green, 2011). In practice, the vast majority of reliability coefficients reported in published research in the organizational sciences on individual

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importance of using valid and reliable assessments regardless of purpose. For instance, 360-degree reviews are useful as developmental tools that provide multisource performance and development feedback across a number of levels within an organization. While these forms of developmental tools may be considered lower stakes (e.g., not used for promotion decisions), they should also demonstrate validity and reliability, such as interrater agreement and reliability (e.g., Brutus et al., 1998; LeBreton et al., 2008; Smither et al., 2005).

[5] As noted earlier, maximizing efficiency and minimizing adverse impact are two equally important goals of the measure selection process. Maximizing efficiency can be informed through the measurement planning and specification process described later in this research note (e.g., considering the cost, burden, and time commitment of each measure in the decision-making process). Minimizing adverse impact, on the other hand, should be continuously monitored throughout the usage of the measure or measure battery for talent management decisions (Aamodt et al., 2010; Hough et al., 2001). When choosing tests to be include in a battery, researchers should consider the trade-off for maximizing absolute validity or classification efficiency and for minimizing subgroup differences (Sager et al., 1997). Volumes of meta-analytic evidence have detailed the adverse impact and differential prediction potential of measures across racial subgroups and other protected classes (Bobko & Roth, 2013; Roth et al., 2017), but bias is a function of not only properties of the measure, but also the analytical approach employed and the talent management system adopted (SIOP, 2018).

[6] In the classical test theory (CTT) approach, coefficient Alpha is the most widely used measure of internal consistency. However, modern test theory approaches like item response theory (IRT) assume *local independence* (i.e., the questions in a measure are not dependent on one another) and shift the focus of attention to the questions that make up the assessment themselves. However, corollaries to coefficient Alpha have been implemented within an IRT framework, such as the indices of separation and reliability that reflect the consistency of theta scores across items (de Ayala, 2009).

differences exceeds .70 (Greco et al., 2018). Regardless, these benchmarks have been criticized due to their non-empirical basis, with many arguing against these mechanistically applied cutoffs (Cho & Kim, 2015). Instead, many recommend a more nuanced approach to internal consistency, such as Cortina's (1993) suggestion that "the finer the distinction that needs to be made, the better the reliability must be" (p. 101).

Validity. V*alidity* evidence for a measure refers to the determination "whether an intended inference from the scores can be supported and justified" (Guion, 2011, p. 180). Moreover, *validation studies* are systematic efforts to obtain evidence to support or reject these inferences (Binning & Barrett, 1989). A commonly utilized conceptualization of validity as reflected in professional guidelines and standards is the tripartite model (Binning & Barrett, 1989; Nunnally & Bernstein, 1994). In this model, there are three traditional concepts that inform the validation process: construct, content, and criterion-related validity (e.g., EEOC, 1978). [7] However, it should be noted that the current conceptualization of validity among researchers has shifted toward a more flexible, unitarian approach. In this perspective, separate and distinct types of validity are eschewed for a view that considers multiple sources of evidence for validity inferences as well as recognizes the permeability and commonality between them (AERA, 2014; Landy, 1986; Messick, 1995; SIOP, 2018). For this reason, our use of the term validity is primarily concerned with construct meaning, content relevance, and criterion relatedness as *pieces of evidence* (of varying magnitudes) towards support for score interpretation and use (SIOP, 2018).[8]

Construct validity, in the personnel selection and measure development literature, refers to evidence used for "justifying a specific measure-construct link"—in other words, that the measure is capturing the "construct" (i.e., attribute) it is intended to assess (Binning & Barrett, 1989, p. 480). *Content validity* refers to evidence that the measure captures all *relevant* aspects of the attribute it is intended to assess (Binning & Barrett, 1989; Colquitt et al., 2019). For this type of validity, inferences based on *correspondence* to the attribute's content and *distinctiveness* from other attributes's content are important considerations (Colquitt et al., 2019). Moreover, issues of *deficiency* (i.e., the measure falls short of capturing the attribute's content) and *contamination* (i.e., the measure captures extraneous, non-relevant features outside the attribute's content) are also useful pieces of evidence for content validity inferences (Nunnally & Bernstein, 1994). Finally, *criterion-related validity* refers to evidence that the measure of the attribute predicts some *criterion* of interest like job performance (Allen et al., in press; Binning & Barrett, 1989; Sussmann & Robertson, 1986).[9]

Criterion-related validity evidence has historically and traditionally been the foremost practical concern of organizational psychologists (Binning & Barrett, 1989). Criterion-related validity is often indexed by a correlation (ranging from -1 [inverse relationship] to 1 [linear relationship]), also known as a *validity coefficient*, between a predictor (e.g., a measure of an

[7] Of course, the types of validity evidence we discuss here do not fully encompass the full extent of validity evidence that can be drawn upon. For instance, internal, external, and statistical conclusion validity provide important pieces of evidence concerning causality, generalizability, and statistical inferences, respectively (Kenny, 2019; Shadish et al., 2002).

[8] Throughout this note, we use the terms "construct validity," "content validity," and "criterion-related validity" for simplicity and parsimony, while acknowledging the prevailing unitarian view on validity.

[9] For a review of common criterion measurement methods in military contexts, see Allen et al. (in press).

attribute from the ATAF) and a criterion (e.g., job performance). Moreover, *concurrent* (i.e., the predictor and criterion are measured at the same time) or *predictive* (i.e., the predictor is measured first and the criterion is measured at a later point in time) validation studies can be conducted to obtain this evidence, and both can be more or less suitable depending upon the situation (Sussmann & Robertson, 1986). The following benchmarks are often used in practice (Cohen, 1988): .10 (weak evidence), .30 (moderate evidence), .50 (strong evidence). However, similar to our earlier treatment of reliability benchmarks and cutoffs, many researchers recommend against the rigid application of cutoff scores and instead consider the magnitude of the correlation in context and with reference to the attribute being measured (Bosco, Aguinis, et al., 2015; Judge & Zapata, 2015).

Adapting Measures: Putting Measurement in Context

Talent management professionals often do not find measures suitable for their assessment needs. In these situations, adapting a pre-existing measure may be a solution. This appears to be a common practice, as Heggestad et al. (2019) found that 46% of all measures used in top management journals were adapted in some way. In their review, they found that items on measures have been translated, lengthened, shortened, re-worded (e.g., changing a self-report to an other-report measure by replacing "I" with "my subordinate), and contextualized (e.g., adding "at work" to the end of each item), among other alterations. Moreover, the mode of response has also been altered as a form of adaptation (e.g., changing a 5-point Likert-type scale to a Behavioral Observation Scale).

Adapting measures is not inherently undesirable. However, talent management professionals that decide to adapt measures would do well to ensure they are transparent and precise in reporting any alterations to the measure they make (Aguinis et al., 2018; Heggestad et al., 2019). Moreover, talent management professionals should strongly consider collecting reliability and validity evidence to determine whether the measure adaptation affected the inferences that can be made from the measure (Heggestad et al., 2019). In this case of adapting modes of response to rating scales, Casper et al. (2020) provide additional guidelines on how to select response anchors.

Developing Measures: Capturing the Construct and Content Domains

If the search for pre-existing measures of the attribute of interest fails, or if it is not feasible to adapt a pre-existing measure, then talent management professionals may consider developing their own. However, the measure development process is a systematic, thorough, and often difficult process that requires critical thinking, careful consideration, and creativity. Fully covering all of the aspects of the measure development process is beyond the scope of this research note, but interested readers are directed to a number of informative sources on the process and best practices (DeVellis, 2012; Hinkin, 1998; Nunnally & Bernstein, 1994; Robinson, 2018; Shultz & Whitney, 2005; Wright et al., 2017).

In preparing to develop a measure, several parameters should be considered ahead of time (analogous to measure specification described in the next section), including the type of measure (e.g., survey), nature of the attribute to be assessed (e.g., theoretical model of the attribute,

dimensionality, distinctiveness from other attributes), context of measure (e.g., workplace, virtual environment), response format (e.g., Likert scale), mode of administration (e.g., proctored, online), measure length (e.g., number of items), and appropriate difficulty level (Shultz & Whitney, 2005). After defining these parameters, the general approach to developing the measure proceeds through several steps (see, for instance, Robinson, 2018):

1. Item generation
2. Preliminary item evaluation for clarity and content validity evidence
3. Preliminary measure administration to a pilot sample and Feedback Collection
4. Feedback implementation
5. Preliminary item analysis and measure revision
6. Measure administration with a follow-up sample
7. Item analysis and construct validation
8. Criterion-related validation

Implementing the Measurement Plan Through Specifications

At this point, the talent management professional should have an understanding of the relevant KSAO(s) they wish to assess along with their options for various measures (either pre-existing, adapted, or developed from scratch). The next step is to complete an attribute by measure matrix (see Table 2), in which each KSAO is mapped onto the measures the talent management professional plans to use. This matrix serves as the foundation for the measurement plan (Russell & Peterson, 2007). Moreover, the matrix contains various properties (e.g., expected reliability, validity, cost) which can help facilitate evaluation and comparison of the measures. If scores on the measure are to be combined (e.g., an overall assessment rating [OAR]), this section of the matrix could also include information on the weighting of the measures and the method of score combination (Spray & Huang, 2000). The result of this step is a measurement plan, or blueprint, describing the selected, adapted, or developed measures, their linkage to KSAOs, and other features of the measures as informed by the job analysis and literature review (Raymond, 2001; Russell & Peterson, 2007).

Once the measurement plan is complete, the next step is to outline the specifications for each measure (Russell & Peterson, 2007). In the *Standards for Educational & Psychological Testing* (2014), specifications are broadly defined, encompassing detailed documentation of the content coverage, format, purpose, equipment requirements, intended use, appropriate populations, length, expected time commitments, time limits, administration procedure, administrator training procedures, scoring, reporting, psychometric characteristics (e.g., reliability and validity evidence), data storage, and security (Russell & Peterson, 2007). There is no single set format for a specification—it should consider all features relevant to each purpose and situation. The result of this process is a specifications document outlining all of the critical design features and operational aspects of the measure. In concert with other specifications within a measurement battery, these documents can be used to guide measure administration operations and logistics, ensuring the measurement plan is implemented appropriately, and that the data collected from the measures is empirically-sound and useful.

Table 2

Attribute by Measure Matrix Example

	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6
KSAO 1	**X**					
KSAO 2	**X**					
KSAO 3	**X**					
KSAO 4		**X**				
KSAO 5			**X**			
KSAO 6				**X**		
KSAO 7					**X**	
KSAO 8					**X**	**X**
KSAO 9					**X**	
KSAO 10						**X**
Measure Type	Ability Test	Simulation	Self-Report Survey	Other-Report Survey	Assessment Center Exercise	Situational Judgment Test
Expected Reliability	.85	.80	.90	.80	.70	.70
Expected Validity Evidence	.50	.50	.25	.20	.30	.25
Adverse Impact	High	Moderate	Low	Low	Moderate	High
Cost	Low	High	Low	Low	High	Moderate

Note. "**X**" refers to whether or not the KSAO is assessed by a given measure. Elements of measure characteristics section of the matrix included only for illustration purposes. Note that it is possible for a measure to assess multiple attributes. Adapted from Russell and Peterson (2007).

Towards an Army Measures Compendium (AMC)

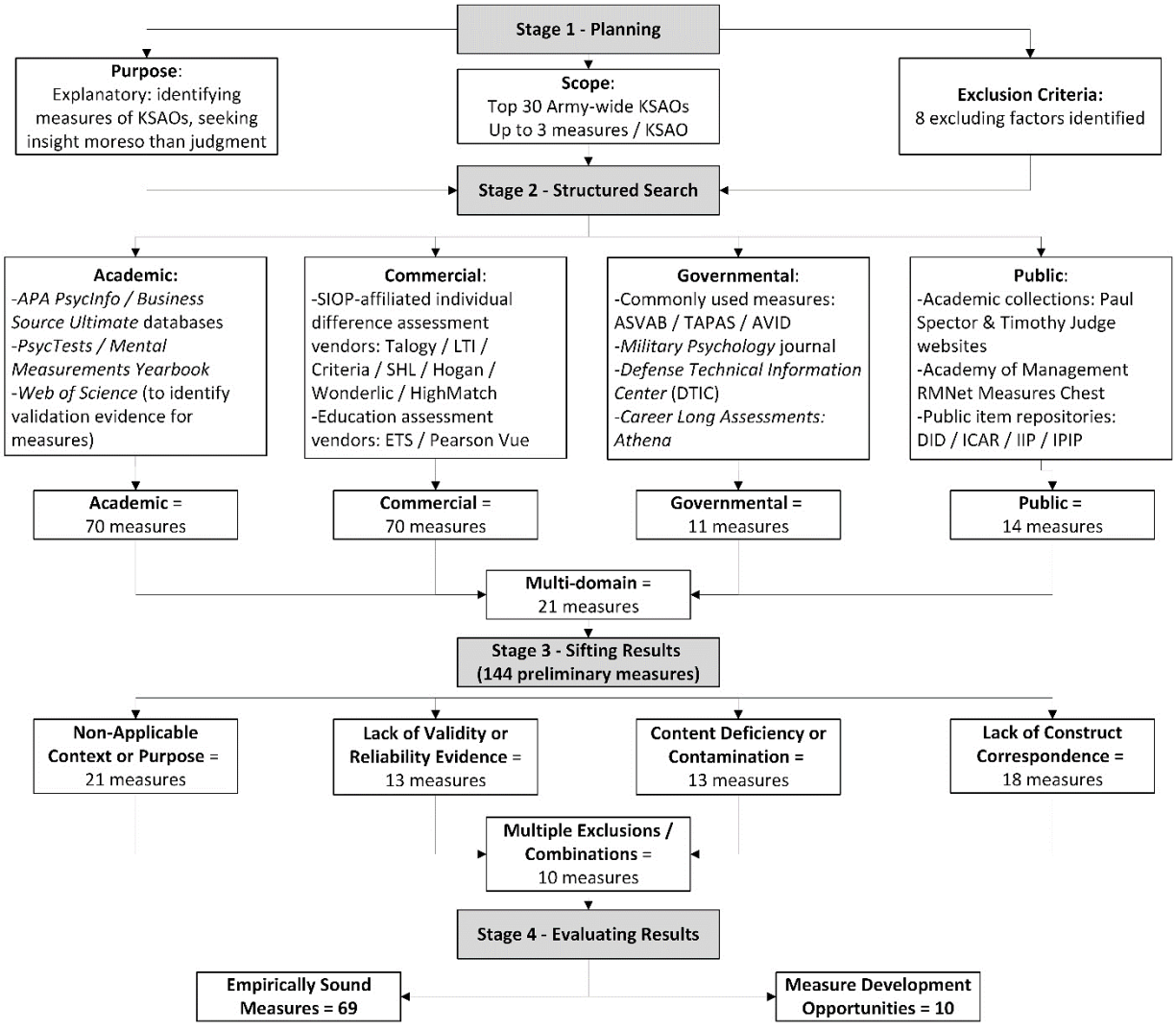
To better assist Army researchers and talent management professionals in identifying measures for acquiring, developing, employing, and retaining talent, we have developed an *Army Measures Compendium* (AMC, shown in Appendix A). The AMC contains measures from various sources that demonstrate the highest historical evidence for reliability and validity and that could be used to measure ATAF KSAOs. To develop this initial version of the AMC, we narrowed our focus to the top 30 most important KSAOs as identified in the Army-wide job analysis efforts and selected up to three measures for each KSAO.

Methodological Approach

The development of the AMC began in August 2022 and was based on a systematic review approach proceeding through the following stages (Madden et al., 2018): (a) planning the search strategy and identifying relevant features to identify, (b) searching for and locating evidence, (c) sifting search results for information meeting the criteria, and (d) systematically extracting data from these results and evaluating them. An overview of our approach is outlined in Figure 2.

Figure 2

Overview of the Systematic Review Process



Stage 1: Planning

In the first stage, we established the purpose for the effort, which was primarily explanatory in nature: to identify measures of ATAF KSAOs and to drive insight into available measures with the highest potential for Army use. We also established the goals and scope of the review, limiting our search to the top 30 most important Army-wide officer KSAOs with a goal of identifying up to three potential measures for each. We established the following explicit criteria for exclusion:

- Historical published research and sources over 30 years old (due to methodological and assessment advancements in individual differences research in the 1990s)
- Unpublished dissertations and theses
- Measures and validation studies specifically developed, administered, or written in languages other than English
- Clinical populations including psychiatric, medical, and family-marital populations
- Validity studies using the measure to predict non-work relevant criteria (e.g., educational adjustment, self-esteem, happiness) or to examine associations between the measure and other individual differences measures
- Assessments designed for non-working age (e.g., children, elderly) populations
- Measures designed to capture time-varying phenomena, such as those developed for education or training gains, diary studies, experience sampling method studies, and ecological momentary assessment studies
- Measures designed for specific contexts or populations, unless the measure was designed for military contexts or populations
- Measures designed to assess group- or organization-level phenomenon (e.g., team characteristics, culture, climate)
- Single-item measures[10]

During this stage, we also outlined the type of information to be collected on the identified measures including the source of the measure and any substantive measure revisions, the domain (i.e., academic, commercial, governmental, or public), measurement features (e.g., number of items, response format, dimensions assessed, time commitment, administration features), measurement type (e.g., situational judgment test [SJT], self-report survey, behavioral observation scale), accumulated reliability evidence (e.g., internal consistency, test-retest), and accumulated criterion-related validity evidence (e.g., validity coefficients). For the criterion-related validity evidence, we also included meta-analytic results when the citing article employed

[10] Although we excluded single-item measures for the purpose of this effort, researchers and practitioners have shown that it is possible to use single-item measures in some circumstances without inherent concerns for validity issues (Matthews et al., 2022). For instance, Matthews et al. (2022) describe how single-item measures are potentially useful in situations where response burden, survey length, item repetition, and criteria contamination are major concerns. They introduced the *Single Item Compendium for Organizational Psychology* as a source of single-item measures. As a caveat, single-item measures have several historical limitations, including content deficiency when used to assess complex, multidimensional constructs, and a low (or more accurately, *unknowable)* internal consistency reliability (see, for instance, Allen et al., 2022). We recommend that Army talent management professionals carefully consider and evaluate the inclusion of single-item measures into their measurement efforts.

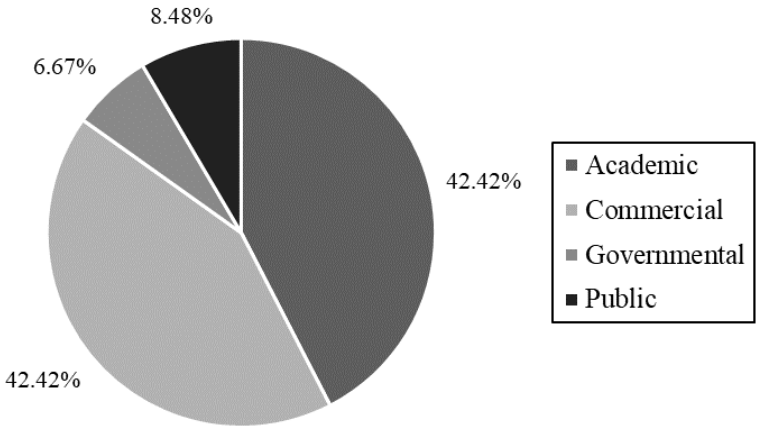
moderator analyses comparing the focal measure with other measures. We also broadened our scope to include relevant criteria beyond job performance (e.g., contextual performance, counterproductive work behavior).

Stage 2: Structured Search

In the second step, we conducted a structured search of various measurement sources. Our search broadly spanned the following four domains: academic, commercial, governmental, and public (see Figure 3 for a pie chart of the sources identified). The search resulted in 144 preliminary measures.

Figure 3

Pie Chart of the Sources Identified in Stage 2



Academic Sources. With regard to academic sources, we relied primarily on targeted searches of the *APA PyscInfo* and *Business Source Ultimate* databases to identify research articles that employed potential measures of the KSAOs. Moreover, we conducted targeted searches of the *APA PsycTests* and *Mental Measurements Yearbook* to capture measure reviews and records of measures that may not have appeared in the previous database searches. Once a measure was identified, we used the *Web of Science* database to obtain articles citing the primary measure source to capture and record reliability and validity evidence. Our literature search resulted in identifying 70 potential academic measures that map onto the top 30 most important ATAF KSAOs for Army officers.

Commercial Sources. In order to identify commercially available measures, we first identified currently operating test vendors that provide individual differences assessment solutions. We searched the *Society for Industrial and Organizational Psychology* (SIOP) 2022 annual conference exhibitor directory, identifying the following vendors: Talogy, Language Testing International (LTI), Criteria, SHL, Hogan, Wonderlic, and High Match. We limited our search to test vendors that employ construct-driven assessments suitable for use in individual differences testing. We excluded test vendors that exclusively develop interview solutions,

training and development evaluations, culture surveys, and engagement surveys, as these purposes fell outside the scope of this effort (e.g., using KSAOs for selection, placement, and prediction). We also included two vendors from the educational testing domain, given their activity in the employment assessment space: the Educational Testing Service (ETS) and Pearson VUE. Where possible, we sought to identify test manuals, technical reports, white papers, and published scientific articles utilizing the identified commercial measures to capture measurement features, reliability information, and validity information from these sources. Our literature search resulted in identifying 70 potential commercial measures that map onto the top 30 ATAF KSAOs.

Governmental Sources. We first identified commonly used governmental measures in the Army context as potential sources, including the Armed Services Vocational Aptitude Battery (ASVAB), the Tailored Adaptive Personality Assessment System (TAPAS), and the Adaptive Vocational Interest Diagnostic (AVID). Supplementing our academic search, we also identified military measures cited within the *Military Psychology* journal. After identifying potential governmental or military measures, we conducted searches within the *Defense Technical Information Center (DTIC)* system for relevant technical reports containing information (e.g., validity, reliability) on the measure. Where relevant, we also searched the *APA PsycInfo*, *Business Source Ultimate*, and *Web of Science* databases for additional information. Our literature search resulted in identifying 11 potential governmental measures that map onto the top 30 ATAF KSAOs.

Career Long Assessments: Athena. In approaching the task of identifying governmental measures, we also sought to reconcile the work conducted by the Center for Army Leadership (CAL, 2022) on *Career Long Assessments: Athena* (henceforth referred to as Athena) with that of the Army Talent Attribute Framework (ATAF). Athena provides information on leadership development assessments available via the Army Enterprise Assessment System (AEAS) and is a critical self-development and awareness resource for the Army.

First, we wanted to ensure that the Athena's KSAOs were sufficiently represented within the ATAF. We were able to map each of the KSAOs identified from Athena onto Tier 3 ATAF KSAOs, without identifying any gaps (see Appendix B). Second, we reviewed a list of 13 assessment batteries identified from Athena to identify relevant measures of the top 30 KSAOs from the ATAF.

Although we identified some sources from Athena (e.g., the I-ADAPT measure as a potential measure of the Adaptability KSAO), not all measures fell within the scope of the current effort. For instance, although the Systems Thinking Assessment would be a candidate for the Systems Thinking KSAO within the ATAF, it did not fall into the top 30 KSAOs identified in the Army-wide job analysis (Royston & Lin, 2022). Moreover, based on our work mapping the ATAF on the Athena KSAOs, we concluded that some of the assessments identified may capture multiple KSAOs, given that they were intended to be used as "assessment batteries." For instance, the Army Critical Thinking Test (ACTT) could capture all the following ATAF KSAOs: critical thinking, analytical thinking, analyze data or information, interdisciplinary reasoning, awareness of cognitive biases, mental agility, reflective thinking, and analyzes and organizes information to create knowledge. Given the breadth of KSAOs covered in each battery

and their implications for increasing self-awareness and development, we concluded that the Athena batteries would be useful for talent development, especially when the focus is on a higher tier within the ATAF that encompasses multiple KSAOs (e.g., Tier 2). Therefore, Army talent management professionals should consider drawing upon the Athena assessment batteries, especially if they intend to capture multiple, related KSAOs to enhance efficiency (Russell & Peterson, 2007).

Public Sources. As a final source for measures, we searched through public, open-source resources, repositories, and collections managed by professional societies, institutions, and professors.[11] First, we drew upon the measures collections managed and hosted by Professors Timothy Judge (2022) and Paul Spector (2022), given their scholarship in individual differences. Second, we conducted searches for ATAF KSAOs within the *Academy of Management* (AOM), Research Methods Division *Measure Chest* (2022). This resource is a common source of measures within the fields of management, human resources, and organizational behavior. Finally, we drew upon several public-domain item repositories, including the *Database of Individual Differences (DID)*, *the International Personality Item Pool (IPIP)*, the *Interest Item Pool (IIP)*, and the *International Cognitive Ability Resource (ICAR)*, to identify public-domain measures of the ATAF KSAOs (Condon, 2019; Goldberg, 2022; The International Cognitive Ability Resource Team, 2014; Liao et al., 2007). Where relevant, we also searched the *APA PsycInfo*, *Business Source Ultimate*, and *Web of Science* databases for additional information on the public measures we identified. Our literature search resulted in identifying 14 potential public-domain measures that map onto the top 30 ATAF KSAOs.

Stage 3: Sifting Results

In the third stage of the systematic review, we sifted through the measures identified in the previous stage, ensuring that they met our inclusion and exclusion criteria. To start, it is worth mentioning that in research and practice, it is important to take a nuanced approach to measure evaluation and selection that takes into account a critical evaluation of the collected evidence, the potential of the assessment to meet Army needs, and tradeoffs surrounding their usage. This stage involved several iterations—the first step involved reviewing the amassed evidence (e.g., reliability, validity) associated with each measure identified in Stage 2 and noting special circumstances and considerations for each measure. The second step involved rating each assessment as a reject, borderline, or acceptable assessment, based on this review. Reasons for rejection were outlined in advance of this step and include: development within a non-applicable context or used for a non-applicable purpose, little reliability or criterion-related validity evidence, content deficiency or contamination,[12] and a lack of correspondence with the construct.

[11] Measures identified via the professor-hosted collections and the *Measure Chest* could also be considered academic measures. In this and in similar situations, we accounted for the dual-categorization of measures across domains (e.g., academic and public) identifying 21 total multi-domain measures (see Figure 2).

[12] Assessments can be designed to be *multidimensional* and capture multiple KSAOs. For instance, dispositional measures often capture more than one personality trait (e.g., agreeableness, extraversion) and, potentially, multiple facets of these traits (e.g., an extraversion measure in alignment with the ATAF might contain subscales of assertiveness, attention seeking, enthusiasm, initiative, and sociability). The evaluation of content contamination and deficiency plays a major role in determining whether to adopt a given measure, either unidimensional or

In the final and third step, we integrated the evidence and reasoning behind these decisions to arrive at a list of up to three suitable measures per KSAO.

To illustrate the third stage of our systematic review, we use the top-rated Army-wide officer KSAO (i.e., communication ability) as an example. For this KSAO, five initial measures were identified. Of these five measures, two were rated as borderline (e.g., The Verbal Domain subscale of the Social Skills Inventory, Riggio, 2005; Self-perceived Communication Competence Scale, McCroskey & McCroskey, 1988) and one was rated as a rejection (e.g., Communicative Competence, Wiemann, 1977). The Communicative Competence measure was rejected outright, as in reviewing the evidence for this measure, there were no applications to work or community samples of adults. This assessment was primarily used with clinical, elderly, and child samples. For the Verbal Domain Subscale of the Social Skills Inventory, despite good reliability evidence (up to .88 for internal consistency, up to .96 for test-retest), little validation evidence was found to support its use operationally. Moreover, the assessment tended to be used as an outcome in research, suggesting that it may be more suitable to assess gains in social skills as a result of an intervention. Finally, the Self-Perceived Communication Competence subscale was ultimately excluded as well despite excellent reliability evidence (.92 internal consistency), given the authors' self-admission that the scale has little validity, and the self-reported nature of this type of attribute was less than ideal. Two assessments were retained: Rubin's (1985) Communication Competency Assessment Instrument / Self-Report (CCAI/CCSR) and the Arch Profile Communication Skills Assessment (COMSA-R2). The former was retained given its overall reliability evidence (e.g., interrater reliability up to .97, up to .86 internal consistency reliability) and its validity in influencing decisions (validity coefficient, $r = .22$). Another benefit to this assessment is that it can be given simultaneously as an other-report and self-report. The COMSA-R2 was retained given its excellent reported reliability evidence (e.g., .91 internal consistency reliability). Although not explicitly reporting validity coefficients, the developers (Arch Profile) noted that their validation evidence is based off of a sample of nearly twenty-three thousand examinees. Moreover, the assessment is used by many reputable corporations including Cisco, Yahoo!, McDonald's, and Verizon, contributing to its face validity.

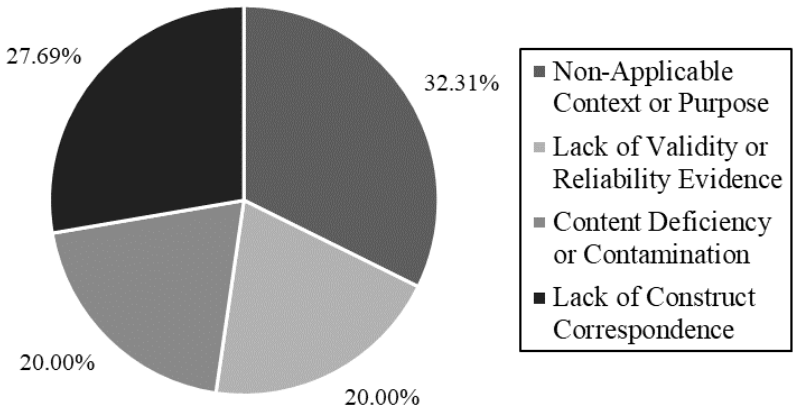
As a result of this process, we identified 21 measures that were developed within a non-applicable context or used for a non-applicable purpose (e.g., non-work environments, measures of team-level phenomena), 13 measures with little reliability or criterion-related validity evidence to support their use, 13 measures that exhibited content deficiency or contamination, and 18 measures exhibiting a lack of construct correspondence. Moreover, we identified 8 measures with multiple reasons for exclusion. Finally, we identified two cases in which measures

multidimensional, including any of its subscales. In approaching this issue, Talent Management professionals should determine the content space of what they are hoping to capture (e.g., the KSAO definitions from the ATAF), and choose a measure that most closely aligns with the content space of their desired attributes. For instance, the paragraph comprehension subscale from the ASVAB would be appropriate for use as a measure of reading comprehension—however, it would not make sense to use the entire ASVAB, as it contains content beyond the conceptual space of reading comprehension (e.g., arithmetic reasoning, math knowledge). As an example of how we addressed these issues in our work, although we identified a potential measure for Sound Judgement in the Justifying Conclusions Inventory (JCI; McGinnis, 2016), we determined that the measure was content deficient—in other words, it did not capture all relevant elements of sound judgment, including opinion formation, sensible decision-making, reliable guessing, and evaluations of personnel to develop solutions.

of the same construct, but with different measurement methods, were introduced by the same authorship team. In these cases, we grouped these measures together for the final list.

Figure 4

Pie Chart of the Sources Sifted in Stage 3



Stage 4: Evaluating Results

At this stage, we identified 69 empirically-sound measures for potential use in assessing the top 30 Army-wide officer KSAOs from the ATAF (47.92% of preliminary measures from Stage 3). These measures, their properties, validity, and reliability information, are all depicted in the AMC (see Appendix A).[13]

Measurement Development Opportunities

We were also able to identify a number of measure development opportunities as a result of this process.[14] For instance, in addition to situations in which we were unable to identify a suitable measure from our search (KSAOs such as “Active Learning” and “Sustains a Climate of Trust”), we also identified situations in which there were opportunities to develop better measures for the Army’s purposes. We believe that the following KSAOs would be candidates for measure development efforts:

[13] Following this stage, a reviewer pointed out that the Dependability KSAO could be captured by the Responsibility scale of the TAPAS (Drasgow et al., 2012). Given its relatively favorable evidence, we agreed that this measure was fit for inclusion in the top 3 measures of Dependability and included it in the compendium, although it was not one of the measures identified in our original search due to differences in terminology used (e.g., "responsibility" rather than "dependability").

[14] Although ten opportunities were identified in our original sifting process, we removed "analyzes and organizes information to create knowledge" from consideration following Stage 4 because a new measure would likely be an incremental contribution and because the available measure we identified adequately captures the KSAO.

- Communication Competence: Given the multidimensionality of the attribute (i.e., maintaining listener interest through verbal and nonverbal means, adjusting information strategies, ensuring prompt information dissemination, avoiding miscommunication, verifying a shared understanding) and general lack of criterion-related validity evidence relevant to the Army context, a measure that captures the content domain of communication competence and predicts Army criteria could be desirable.
- Sound Judgment: The measures identified could be considered proxy measures for sound judgment. However, none of these measures were developed to capture the content domain of sound judgment as explicated in the ATAF. A measure capturing shrewd assessment of situations, drawing sound conclusions, forming sound opinions, making sensible decisions, making reliable guesses, assessing strengths and weaknesses of others, and creating appropriate solutions could address this concern.
- Mental Agility: Measures provided are all self-report, despite reflecting the construct domain of mental flexibility, cognitive adaptation, thinking through decisions or actions in uncertainty, and applying multiple perspectives and approaches. There may be an opportunity to develop a cognitive or performance-based measure of the construct that better aligns with the conceptualization of the attribute.
- Self-Management: Available measures for self-management exhibit minimally acceptable reliability and validity evidence. Other common measures, including the Lifestyle Approaches scale (Williams et al., 1992) and the Self-Control and Self-Management scale (Mezo, 2009) were developed in a clinical context, and focused on self-management as a coping skill. There is an opportunity to develop a self-management measure more tailored to a military context and in alignment with the content domain of the KSAO.
- Coordination/Teamwork: Available measures for coordination/teamwork are primarily focused on capturing the emerging state of implicit or explicit coordination in intact teams. These measures, although potentially adaptable, do not focus on coordination/teamwork as a skill. Therefore, a psychological measure of coordination behavioral tendencies within Army group contexts (e.g., squads) could be useful.
- Active Learning: We were unable to identify any measures that capture the attribute as defined in the ATAF. Most measures assume active learning reflects a process or state of engagement with the active (i.e., discovery or experiential) aspects of learning. As defined in the ATAF, active learning more closely reflects understanding the implications of new information as they inform future problem-solving and decision making. A measure that focuses on accurate usefulness and utility evaluations of information for problem solving would more closely reflect the attribute.
- Interpersonal Tact: Measures identified closely align with the conceptual and content domain of the interpersonal tact attribute—however there is opportunity to develop an Army-specific measure (e.g., an SJT) that more closely captures all aspects of the attribute (e.g., understanding the character and motives of others) and that takes into account Army situations and contexts.
- Problem Sensitivity: Although measures identified do reflect the ability to identify or forecast problems ("when something is wrong or is likely to go wrong"), the contexts within which the measures were developed may not apply across positions (e.g., community samples of adults, criminal justice officers). There may be an opportunity to

develop a contextualized measure of problem sensitivity better suited to the Army context.

- Sustains a Climate of Trust: We were unable to identify any measures that capture the attribute as defined in the ATAF. Although there are measures of trustworthiness attributions (Mayer & Davis, 1999), behaviors leading to trust in leaders (Yang & Mossholder, 2010), and trustworthy behavior (Sebastian Reiche et al., 2014), this attribute exclusively refers to behaviors that foster and sustain a climate of trust in their work unit. To assess this attribute, a measure would need to be developed (akin to a psychological climate measure) which captures: awareness of conditions that affect trust; engaging in actions that keep people informed; following through on actions and meeting others' expectations; and gaining trust by being firm, fair, and respectful.

Discussion

The development of the ATAF was a critical step forward in advancing talent management practices within the Army (Royston et al., 2022). By creating a universal taxonomy of KSAOs, the ATAF established a common language to discuss talent attributes, reconciling terminologies and definitions Army-wide. A critical need emerging from these efforts is to aid Army talent management professionals in determining potential measures that reliably and validly capture the ATAF KSAOs, along with how to select these measures for various talent management purposes. In this research note, we accomplished these objectives in two ways. First, we broadly outlined the process of measurement planning and specifications for Army talent management professionals. Second, we conducted a systematic review (Madden et al., 2018) of measures that capture the top 30 officer KSAOs identified in the Army-wide job analysis, resulting in 69 potential measures for talent management purposes. Army talent management professionals can use the results of our work as a starting point for engaging in their own efforts to select, adapt, or develop measures or measurement batteries for various talent management purposes (e.g., acquisition, development, retention). The initial development of the AMC has a number of implications for Army talent management and future research, which we describe in the next section.

Limitations and Directions for Future Research

Although we believe our approach to identifying measures was thorough, the current effort is limited in several ways, which we believe highlight areas for additional research that could benefit Army talent management practice. First, we intended for our work to be an initial effort, limiting our scope to the top 30 officer KSAOs, and not the entire domain of KSAOs in the ATAF. We would welcome the further development of the AMC spanning the entire ATAF that can be leveraged by talent management practitioners for various purposes. Second, although our measures search was expansive (e.g., capturing academic, commercial, governmental, and public sources), it is possible that some useful and empirically sound measures were excluded due to our search criteria and parameters. Ultimately, creating a collaborative, dynamic database of measures that evolves and expands over time could address this limitation.

Despite these limitations, we also believe that this effort has illuminated a number of areas for future research that could benefit the Army. Beyond developing measures for the

KSAO-measure gaps identified in our systematic review, future efforts could focus on measure identification or development for Army-specific (e.g., Knowledge of Combined Arms Operations) and role-specific (e.g., Functional area [FA]/occupation-specific Knowledge and Skill) KSAOs (Royston et al., 2022). In some instances, measures selected to assess attributes for one job or function may not operate in the same way in other jobs or functions. This is particularly relevant for Army personnel as they rank up—for example, KSAOs that facilitated success at one rank may not be as relevant in a higher rank. Further, KSAO requirements may differ by assignment (e.g., platoon leader versus executive officer), even when individuals hold the same MOS or AOC. Future research can focus on how KSAO importance may shift over the course of an individual's assignment and career. In parallel, future research aimed at understanding specific assignment KSAO requirements can better inform selection of assessments for those positions.

As an illustration of these points, the *Motivating Others* KSAO involves the use of appropriate influence techniques. But can we assume the most effective influence techniques leaders may use with followers would generalize to those that Army recruiters would use with potential recruits (Magnusen et al., 2011)? Similarly, can we assume that influence technique measures developed and validated on business leaders would generalize to military leaders? What would be the implications for interpreting scores on a measure of motivating others across these jobs or ranks? Future research could examine differences in cross-function measurement considerations or consider tailoring measures to specific branch/FAs of military occupational specialties (MOSs). To this end, *synthetic validation* approaches could be helpful to forecast the best measures and batteries to use in other contexts, especially those which have smaller numbers of incumbents or for jobs that have not been created yet (Crafts et al., 1988; Scherbaum, 2005; Wise et al., 1991). Furthermore, many of the measures identified in the AMC were designed to be used across contexts. However, there is often a need to measure attributes within a specific context (e.g., work, combat). Additional measure adaptation efforts could focus on identifying relevant Army contexts and developing context-specific measures to enable precision of measurement. This highlights the need for researchers to consider the specific and unique contexts and work situations encountered by Army personnel.

Although we believed the systematic review approach we selected was sufficient for our purposes, future research could also employ meta-analytic techniques to summarize the accumulated evidence for measures in the AMC (Hedges & Olkin, 1985; Schmidt & Hunter, 2015). There are several benefits to a meta-analytic approach that may guide future research and inform measurement planning and specifications. Meta-analysis can help diagnose publication bias and reconcile conflicting or inconsistent reliability and validity evidence across primary data collection efforts, such as those identified in the replication crises in the social sciences (Ones et al., 2017). Meta-analyses enable researchers to answer research questions with heightened precision (e.g., through correcting for unreliability and restriction of range), above-and-beyond what one might obtain in a single effort (Stone & Rosopa, 2017). Furthermore, meta-analysis can be used to examine the optimal and boundary conditions for predictor-criterion relationships (Gonzalez-Mulé & Aguinis, 2018). With regard to measurement in particular, advancements in meta-analytic confirmatory factor analysis, item-level meta-analysis, and reliability generalization could be useful for verifying the dimensionality of the Tier 3 ATAF KSAOs that comprise higher-order Tier 2 KSAOs, examining whether items exhibit similar loading patterns

across primary data collection efforts, and determining whether reliability estimates generalize across these efforts (Oh, 2020). These approaches can help inform the development of measurement plans and specifications in Army talent management applications.

Army measure development and revision efforts should also consider the *bandwidth-fidelity dilemma*. This dilemma was first discussed by Cronbach and Gleser (1965), who recognized that there is an inherent tradeoff between (1) attaining a *narrow*, high degree of measurement specificity of an attribute (i.e., fidelity) and (2) capturing a *broad*, general collection of features characterizing an attribute (i.e., bandwidth). Therefore, the bandwidth-fidelity dilemma suggests that attributes measured at either a high bandwidth or high fidelity may exhibit different relationships with criteria—with narrow measures of an attribute exhibiting maximal criterion-related validity with narrow measures of the criterion (Ones & Viswesvaran, 1996). For instance, although a broad measure of general fitness (e.g., U.S. Army Physical Fitness Test, ATAF Tier 2) may moderately predict how fast someone can swim between two points in a combat exercise or situation, a narrow measure of swimming ability (e.g., U.S. Army Swim Test, ATAF Tier 3) may exhibit even higher criterion-related validity than a broad one.

The issue of bandwidth-fidelity has been approached in a number of ways. For instance, meta-analysis was leveraged to diagnose bandwidth fidelity issues in the relationship between dispositions and criteria, demonstrating the utility in using narrow traits in the prediction of job performance (Judge et al., 2013) and job satisfaction (Steel et al., 2019). However, some research suggests that when considered in tandem, narrow traits do not exhibit incremental validity above-and-beyond broad traits, at least with reference to the five-factor model (Salgado et al., 2015). But practically speaking, many suggest the question does not necessarily revolve around *which* approach one should adopt, but rather *when* to adopt either approach (Judge & Kammeyer-Mueller, 2012). Furthermore, Hogan and Roberts (1996) suggest that the available criterion should ultimately guide the level of bandwidth or fidelity in the predictor.

Given the complexity of this issue, future measurement development efforts in the Army would do well to consider this issue. Army talent management professionals should consider the implications of the bandwidth-fidelity issue in measure selection, revision, and development as well as in the application of analytical techniques. For instance, in their revision of the Big Five Inventory (BFI), Soto and John (2017) theoretically specified a hierarchical model (of broad and narrow traits) and specifically developed the measure to capture this structure and account for bandwidth-fidelity issues. Moreover, Cheng et al. (2009) suggested that modeling techniques capable of taking into account hierarchy and multidimensionality (e.g., IRT, Rasch analysis) can help address the bandwidth-fidelity dilemma. As a final example, applying machine learning (ML) techniques to tackling the bandwidth-fidelity dilemma also hold promise in that they can be used to determine the optimal level at which to measure a given attribute to maximize criterion-related validity (Speer et al., 2022).

As another direction for future research, the application of advanced data collection methods (e.g., sociometric sensors) and analytical techniques (e.g., ML) can afford efficiencies in procedure, speed, and efficiency of the measurement planning and specifications process. The advent of Big Data has made it possible to collect and analyze social media and other web-based data; images, audio, and videos; as well as sociometric sensors (Song et al., 2020). Army talent

management professionals could draw upon these more implicit sources of data as potential modes of measuring KSAOs from the ATAF. Relatedly, advancements in semantic measurement utilizing natural language processing (NLP) have made it possible to measure and capture KSAOs from text data (Kjell et al., 2019). These techniques could be used to analyze implicit data sources or otherwise aid in the development of constructed response measures of attributes. For example, Jackson et al. (2018) used NLP in designing conversation-based assessments to not only assess examinees' ability to communicate and express knowledge and skills in their own words, but also to generate adaptive follow-up questions to diagnose their misunderstanding of the questions or assess additional areas of conversational efficacy.

Furthermore, advanced analytical techniques could be employed to create more useful career development systems. For instance, moving beyond merely providing a score or level to Army personnel on each KSAO, Army talent management professionals could employ diagnostic classification models (DCMs) to more precisely assess mastery of multi-dimensional KSAOs (Ravand & Baghaei, 2020; Sessoms & Henson, 2018). DCMs can be used to develop measures that capture skill in executing multi-step procedures, higher-order attribute structures (i.e., different aspects of a KSAO along with dependencies between them), and provide useful feedback to personnel regarding what they should work on developing when moving from baseline to assignment developed KSAOs. Notably, DCM approaches can be combined with ML within an adaptive testing framework to automatically and dynamically select the items that are the strongest predictors of mastery, and then score the items using DCM (Gonzalez, 2021).

Automatic item generation and automated test assembly could also be used to rapidly produce high-quality, relevant items for a given measure of the ATAF KSAOs. These procedures can help bolster test security and minimize item exposure in high-stakes contexts (Gierl & Lai, 2015; van der Linden & Diao, 2011). Taking these approaches a step further, a dynamic, meta-analytic database containing accumulated reliability and validity evidence, adverse impact potential, and efficiency features, along with linkage and attribute-by-measure matrices from job analyses, could be used to facilitate *automated battery assembly*. For instance, for any given job, context, and set of KSAOs, automated battery assembly could produce a battery with the highest validity for that job and in that context. Moreover, one could imagine employing pareto-optimization techniques that have been used in selection system design to create optimal weightings of these measures in generating overall scores (Rupp et al., 2020). Pareto optimization may prove useful in navigating tradeoffs in measurement (De Corte et al., 2022), such as the measurement planning, diversity-validity, bandwidth-fidelity tradeoffs discussed throughout this research note (Ones & Viswesvaran, 1996; Ployhart & Holtz, 2008; Rupp et al., 2020; Russell & Peterson, 2007). These directions for research and the practical Army implications that follow have the potential to advance the power and efficiency of Army talent management applications.

Conclusion

The measurement planning and specifications process is integral to the successful application of the ATAF to talent management decisions in the Army. Careless measurement planning and execution can result in talent management decisions that are neither reliable nor evidence-based, and that can be potentially biased and inefficient. To better equip Army talent management professionals in approaching the measurement planning and specifications process, we provide a high-level overview and tutorial of the measurement planning and specifications development process. Moreover, we introduce the AMC, an initial effort toward identifying 69 evidence-based measures for the top 30 Army-wide officer KSAOs from the ATAF. We hope our work inspires Army talent management professionals to carefully consider the measurement planning process to systematically select the best approach for their purposes and to consider the viability of collaboratories to share and exchange measures and measurement techniques across the Army and Department of Defense. Moreover, we hope that our work inspires directions for future research on measurement planning and specifications, including new measure development and automation opportunities, addressing measurement tradeoffs (e.g., bandwidth-fidelity, validity-diversity), and the application of predictive analytics and modeling to drive process efficiencies.

References

Note. * Denotes measure development and validation studies cited within the Army Measures Compendium.

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Aamodt, M. G., Cohen, D. B., & Dunleavy, E. M. (2010). *Best Practices in Adverse Impact Analyses*. Technical Advisory Committee, The Center for Corporate Equality. https://adverse-impact.com/research/

*Abadin, H., Fried, D., Good, G., & Surface, E. (2010). *Reliability Study of ACTFL OPIc® in Spanish, English, and Arabic for the ACE Review* (Report No. 2012020610). Surface, Ward & Associates

*Abadin, H., Fried, D., Good, G., & Surface, E. (2012). *Reliability Study of the ACTFL OPI® in Chinese, Portuguese, Russian, Spanish, German, and English for the ACE Review* (Report No. 2012020609). Surface, Ward & Associates

Academy of Management Research Methods Division. (2022, August). *Measure Chest* [Database]. http://www.rmdiv.org/?page_id=104

Aguinis, H., Ramani, R. S., & Alabduljader, N. (2018). What you see is what you get? Enhancing methodological transparency in management research. *Academy of Management Annals*, *12*(1), 83-110. https://doi.org/10.5465/annals.2016.0011

*AIIR. (2022). *The AIIR Team Effectiveness Survey*. AIIR Consulting. https://aiirconsulting.com/team-effectiveness-survey/

Allen, M. J., & Yen, W. M. (1979). *Introduction to Measurement Theory*. Wadsworth.

Allen, M. S., Iliescu, D., & Greiff, S. (2022). Single item measures in psychological science: A call to action [Editorial]. *European Journal of Psychological Assessment, 38*(1), 1–5. https://doi.org/10.1027/1015-5759/a000699

Allen, M., Russell, T., Ford, L., Carretta, T., Lee, A., & Kirkendall, C. (2022). Identification and evaluation of criterion measurement models. Advanced online publication. .*Military Psychology*. https://doi.org/10.1080/08995605.2022.2050165

*Althuizen, N. (2012). The relative performance of different methods. *Marketing Letters: A Journal of Research in Marketing*, *23*(4), 973-985. https://doi.org/10.1007/s11002-012-9198-x

*Althuizen, N., Wierenga, B., & Rossiter, J. (2010). The validity of two brief measures of creative ability. *Creativity Research Journal*, *22*(1), 53-61. https://doi.org/10.1080/10400410903579577

American Educational Research Association. (2014). *Standards for Educational and Psychological Testing*. https://www.aera.net/Publications/Books/Standards-for-Educational-Psychological-Testing-2014-Edition

*Arch Profile. (2022). *Communications Skill Assessment - 2nd Revision (COMSA-R2)*. https://hrtests.archprofile.com/comsa-r2

*Bäckström, M., Larsson, M. R., & Maddux, R. E. (2009). A structural validation of an inventory based on the Abridged Five Factor Circumplex Model (AB5C). *Journal of Personality Assessment*, *91*(5), 462-472. https://doi.org/10.1080/00223890903088065

*Bar-On, R. (2018). The Multifactor Measure of Performance: Its development, norming, and validation. *Frontiers in Psychology*, *9*, Article 140. https://doi.org/10.3389/fpsyg.2018.00140

*Bar-On, R., & Fiedeldey-Van Dijk, C. (2022). The Bar-On Model and Multifactor Measure of Human Performance: Validation and application. *Frontiers in Psychology*, *13*, Article 872360. https://doi.org/10.3389/fpsyg.2022.872360

*Bartone, P. T. (1999). Hardiness protects against war-related stress in Army Reserve forces. *Consulting Psychology Journal: Practice and Research*, *51*(2), 72-82. https://doi.org/10.1037/1061-4087.51.2.72

*Bartone, P. T. (2007). Test-retest reliability of the Dispositional Resilience Scale-15, a brief hardiness scale. *Psychological Reports*, *101*(3), 943-944. https://doi.org/10.2466/PR0.101.7.943-944

*Bartone, P. T., & Bowles, S. V. (2021). Hardiness predicts post-traumatic growth and well-being in severely wounded Serviceman and their Spouses. *Military Medicine*, *186*(5-6), 500-504. https://doi.org/10.1093/milmed/usaa250

*Bartone, P. T., Eid, J., Johnsen, B. H., Laberg, J. C., & Snook, S. A. (2009). Big five personality factors, hardiness, and social judgment as predictors of leader performance. *Leadership & Organization Development Journal*, *30*(6), 498-521. https://doi.org/10.1108/01437730910981908

*Bartone, P. T., Johnsen, B. H., Eid, J., Brun, W., & Laberg, J. C. (2002). Factors influencing small-unit cohesion in Norwegian Navy officer cadets. *Military Psychology*, *14*(1), 1-22. https://doi.org/10.1207/S15327876MP1401_01

*Bartone, P. T., Johnsen, B. H., Eid, J., Hystad, S. W., & Laberg, J. C. (2017). Hardiness, avoidance coping, and alcohol consumption in war veterans: A moderated-mediation study. *Stress and Health*, *33*(5), 498-507. https://doi.org/10.1002/smi.2734

*Bartone, P. T., Kelly, D. R., & Matthews, M. D. (2013). Psychological hardiness predicts adaptability in military leaders: A prospective study. *International Journal of Selection and Assessment*, *21*(2), 200-210. https://doi.org/10.1111/ijsa.12029

*Bartone, P. T., McDonald, K., Hansma, B. J., Stermac-Stein, J., Escobar, E. R., Stein, S. J., & Ryznar, R. (2022). Development and validation of an improved hardiness measure: The hardiness resilience gauge. *European Journal of Psychological Assessment*. *39*(3), 222-239. https://doi.org/10.1027/1015-5759/a000709

*Bartone, P. T., Roland, R. R., Picano, J. J., & Williams, T. J. (2008). Psychological hardiness predicts success in U.S. Army Special Forces candidates. *International Journal of Selection and Assessment*, *16*(1), 78-81. https://doi.org/10.1111/j.1468-2389.2008.00412.x

*Bartone, P. T., Ursano, R. J., Wright, K. M., & Ingraham, L. H. (1989). The impact of a military air disaster on the health of assistance workers: A prospective study. *Journal of Nervous and Mental Disease*, *177*(6), 317-328. https://doi.org/10.1097/00005053-198906000-00001

*Bartone, P. T., Valdes, J. J., & Sandvik, A. (2016). Psychological hardiness predicts cardiovascular health. *Psychology, Health & Medicine*, *21*(6), 743-749. https://doi.org/10.1080/13548506.2015.1120323

*Bechtoldt, M. N., Beersma, B., & van Kleef, G. A. (2019). When (not) to empathize: The differential effects of combined emotion recognition and empathic concern on client satisfaction across professions. *Motivation and Emotion*, *43*(1), 112-129. https://doi.org/10.1007/s11031-018-9725-z

*Bechtoldt, M. N., Rohrmann, S., De Pater, I. E., & Beersma, B. (2011). The primacy of perceiving: Emotion recognition buffers negative effects of emotional labor. *Journal of Applied Psychology*, *96*(5), 1087-1094. https://doi.org/10.1037/a0023683

Binning, J. F., & Barrett, G. V. (1989). Validity of personnel decisions: A conceptual analysis of the inferential and evidential bases. *Journal of Applied Psychology*, *74*(3), 478-494. https://doi.org/10.1037/0021-9010.74.3.478

*Birenbaum, M., Nasser-Abu Alhija, F., Shilton, H., Kimron, H., Rosanski, R., & Shahor, N. (2019). A further look at the five-dimensional curiosity construct. *Personality and Individual Differences*, *149*, 57-65. https://doi.org/10.1016/j.paid.2019.05.038

*Blacksmith, N., Yang, Y., Behrend, T. S., & Ruark, G. A. (2019). Assessing the validity of inferences from scores on the Cognitive Reflection Test. *Journal of Behavioral Decision Making*, *32*(5), 599-612. https://doi.org/10.1002/bdm.2133

*Blickle, G., John, J., Ferris, G. R., Momm, T., Liu, Y., Haag, R., Meyer, G., Weber, K., & Oerder, K. (2012). Fit of political skill to the work context: A two-study investigation. *Applied Psychology: An International Review*, *61*(2), 295-322. https://doi.org/10.1111/j.1464-0597.2011.00469.x

*Blickle, G., Kranefeld, I., Wihler, A., Kückelhaus, B. P., & Menges, J. I. (2022). It works without words: A nonlinguistic ability test of perceiving emotions with job-related

consequences. *European Journal of Psychological Assessment*, *38*(3), 210-223. https://doi.org/10.1027/1015-5759/a000656

*Blickle, G., Momm, T. S., Kramer, J., Mierke, J., Liu, Y., & Ferris, G. R. (2009). Construct and criterion-related validation of a measure of emotional reasoning skills: A two-study investigation. *International Journal of Selection and Assessment*, *17*(1), 101-118. https://doi.org/10.1111/j.1468-2389.2009.00455.x

Bobko, P., & Roth, P. L. (2013). Reviewing, categorizing, and analyzing the literature on black-white mean differences for predictors of job performance: Verifying some perceptions and updating/correcting others. *Personnel Psychology*, *66*(1), 91-126. https://doi.org/10.1111/peps.12007

*Bodie, G. D. (2011). The Active-Empathic Listening Scale (AELS): Conceptualization and evidence of validity within the interpersonal domain. *Communication Quarterly*, *59*(3), 277-295. https://doi.org/10.1080/01463373.2011.583495

*Bodie, G. D., Jones, S. M., Vickery, A. J., Hatcher, L., & Cannava, K. (2014). Examining the construct validity of enacted support: A multitrait-multimethod analysis of three perspectives for judging immediacy and listening behaviors. *Communication Monographs*, *81*(4), 495-523. https://doi.org/10.1080/03637751.2014.957223

Bosco, F. A., Aguinis, H., Singh, K., Field, J. G., & Pierce, C. A. (2015). Correlational effect size benchmarks. *Journal of Applied Psychology*, *100*(2), 431-449. https://doi.org/10.1037/a0038047

*Bosco, F., Allen, D. G., & Singh, K. (2015). Executive attention: An alternative perspective on general mental ability, performance, and subgroup differences. *Personnel Psychology*, *68*(4), 859-898. https://doi.org/10.1111/peps.12099

*Brienza, J. P., Kung, F. Y., Santos, H. C., Bobocel, D. R., & Grossman, I. (2018). Wisdom, bias, and balance: Toward a process-sensitive measurement of wisdom-related cognition. *Journal of Personality and Social Psychology*, *115*(6), 1093-1126. https://doi.org/10.1037/pspp0000171

*Britt, T. W., Adler, A. B., & Bartone, P. T. (2001). Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness. *Journal of Occupational Health Psychology*, *6*(1), 53-63. https://doi.org/10.1037//1076-8998.6.1.53

*Brouer, R. L., Badaway, R. L., Gallagher, V. C., & Haber, J. A. (2015). Political skill dimensionality and impression management choice and effective use. *Journal of Business and Psychology*, *30*(2), 217-233. https://doi.org/10.1007/s10869-014-9344-y

Brutus, S., Fleenor, J. W., & London, M. (1998). Does 360-degree feedback work in different industries?: A between-industry comparison of the reliability and validity of multi-source performance ratings. *Journal of Management Development, 17*(3), 177-190. https://doi.org/10.1108/EUM0000000004487

*Brown, M. I., Speer, A. B., Tenbrink, A. P., & Chabris, C. F. (2022). Using game-like animations of geometric shapes to simulate social interactions: An evaluation of group score differences. *International Journal of Selection & Assessment*, *30*(1), 167-181. https://doi.org/10.1111/ijsa.12375

*Bucher, M. A., & Samuel, D. B. (2019). Development of a short form of the Abridged Big Five-Dimensional Circumplex model to aid with the organization of personality traits. *Journal of Personality Assessment*, *101*(1), 16-24. https://doi.org/10.1080/00223891.2017.1413382

*Butler, H. A., Dwyer, C. P., Hogan, M. J., Franco, A., Rivas, S. F., Saiz, C., & Almeida, L. S. (2012). The Halpern Critical Thinking Assessment and real-world outcomes: Cross-national applications. *Thinking Skills and Creativity*, *7*(2), 112-121. https://doi.org/10.1016/j.tsc.2012.04.001

*Byron, K. (2007). Male and female managers' ability to 'read' emotions: Relationships with supervisor's performance ratings and subordinates' satisfaction ratings. *Journal of Occupational & Organizational Psychology*, *80*(4), 713-733. https://doi.org/10.1348/096317907X174349

*Byron, K., Terranova, S., & Nowicki, S. (2007). Nonverbal emotion recognition and salespersons: Linking ability to perceived and actual success. *Journal of Applied Social Psychology*, *37*(11), 2600-2619. https://doi.org/10.1111/j.1559-1816.2007.00272.x

*Campagna, R. L., Dirks, K. T., Knight, A. P., Crossley, C., & Robinson, S. L. (2020). On the relation between felt trust and actual trust: Examining pathways to and implications of leader trust meta-accuracy. *Journal of Applied Psychology*, *105*(9), 994-1012. https://doi.org/10.1037/apl0000474

*Carretta, T. R., & Ree, M. J. (2018). The relations between cognitive ability and personality: Convergent results across measures. *International Journal of Selection and Assessment*, *26*(2-4), 133-144. https://doi.org/10.1111/ijsa.12224

Casper, W. C., Edwards, B. D., Wallace, J. C., Landis, R. S., & Fife, D. A. (2020). Selecting response anchors with equal intervals for summated rating scales. *Journal of Applied Psychology*, *105*(4), 390-409. https://doi.org/10.1037/apl0000444

*Castro, D. R., Anseel, F., Kluger, A. N., Lloyd, K. J., & Turjeman Levi, Y. (2018). Mere listening effect on creativity and the mediating role of psychological safety. *Psychology of Aesthetics, Creativity, and the Arts*, *12*(4), 489-502. https://doi.org/10.1037/aca0000177

Cheng, Y.-Y., Wang, W.-C., & Ho, Y.-H. (2009). Multidimensional Rasch analysis of a psychological test with multiple subtests: A statistical solution for the bandwidth-fidelity dilemma. *Educational and Psychological Measurement*, *69*(3), 369-388. https://doi.org/10.1177%2F0013164408323241

Cho, E. (2016). Making reliability reliable: A systematic approach to reliability coefficients. *Organizational Research Methods*, *19*(4), 651-682. https://doi.org/10.1177/1094428116656239

Cho, E., & Kim, S. (2015). Cronbach's Coefficient Alpha: Well known but poorly understood. *Organizational Research Methods*, *18*(2), 207-230. https://doi.org/10.1177/1094428114555994

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

*Cohen, S. G., Change, L., & Ledford, G. E. (1997). A hierarchical construction of self-management leadership and its relationship to quality of work life and perceived work group effectiveness. *Personnel Psychology*, *50*(2), 275-308. https://doi.org/10.1111/j.1744-6570.1997.tb00909.x

Colquitt, J. A., Sabey, T. B., Rodell, J. B., & Hill, E. T. (2019). Content validation guidelines: Evaluation criteria for definitional correspondence and definitional distinctiveness. *Journal of Applied Psychology*, *104*(10), 1243-1265. https://doi.org/10.1037/apl0000406

Condon, D. (2019). *Database of Individual Differences Survey Tools* [Database]. https://doi.org/10.7910/DVN/T1NQ4V

*Condon, D. M., & Revelle, W. (2014). The international cognitive ability resource: Development and initial validation of a public-domain measure. *Intelligence*, *43*, 52-64. https://doi.org/10.1016/j.intell.2014.01.004

*Connelly, M. S., Gilbert, J. A., Zaccaro, S. J., Threlfall, K. V., Marks, M. A., & Mumford, M. D. (2000). Exploring the relationship of leadership skills and knowledge to leader performance. *The Leadership Quarterly*, *11*(1), 65-86. https://doi.org/10.1016/S1048-9843(99)00043-0

*Conte, J. M., Heffner, T. S., Roesch, S. C., & Aasen, B. (2017). A person-centric investigation of personality types, job performance, and attrition. *Personality and Individual Differences*, *104*, 554-559. https://doi.org/10.1016/j.paid.2016.09.004

Cortina, J. M. (1993). What is Coefficient Alpha? An examination of theory and applications. *Journal of Applied Psychology*, *78*(1), 98-104. https://doi.org/10.1037/0021-9010.78.1.98

*Cotter, E. W., & Fouad, N. A. (2013). Examining burnout and engagement in layoff survivors: The role of personal strengths. *Journal of Career Development*, *40*(5), 424-444. https://doi.org/10.1177/0894845312466957

Crafts, J. L., Szenas, P. L., Chia, W. J., & Pulakos, E. D. (1988). *A Review of Models and Procedures for Synthetic Validation for Entry-Level Army Jobs* (Research Note 88-107). U. S. Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. ADA205438).

*Creative Organizational Design. (2022). *Listening Skills Inventory - Revised*. https://www.creativeorgdesign.com/tests/listening-skills-inventory-revised/

*Criteria. (2022a). *Criteria Attention Skills Test (CAST)*. https://www.criteriacorp.com/assessments/cognitive-aptitude/criteria-attention-skills-test-cast

*Criteria. (2022b). *General Aptitude Mobile Evaluation (GAME)*. https://www.criteriacorp.com/assessments/cognitive-aptitude/general-aptitude-mobile-evaluation-game

Cronbach, L. J., & Gleser, G. C. (1965). *Psychological Tests and Personnel Decisions* (2nd ed.). University of Illinois.

*Cubbellotti, S. (2015). *Examination Evaluation of the ACTFL WPT* (Report No. AAR/WPT/ACE/I-2015-001). American Council on the Teaching of Foreign Languages.

*Cullen, K. L., Edwards, B. D., Casper, W. C., & Gue, K. R. (2014). Employees' adaptability and perceptions of change-related uncertainty: Implications for perceived organizational support, job satisfaction, and performance. *Journal of Business and Psychology*, *29*(2), 269-280. https://doi.org/10.1007/s10869-013-9312-y

de Ayala, R. J. (2009). *The Theory and Practice of Item Response Theory*. Guildford.

*de Bie, H., Wilhelm, P., & van der Meij, H. (2015). The Halpern Critical Thinking Assessment: Toward a Dutch appraisal of critical thinking. *Thinking Skills and Creativity*, *17*, 33-44. https://doi.org/10.1016/j.tsc.2015.04.001

De Corte, W., Lievens, F., & Sackett, P. R. (2022). A comprehensive examination of the cross-validity of pareto-optimal versus fixed-weight selection systems in the biobjective selection context. *Journal of Applied Psychology*, *107*(8), 1243-1260. https://doi.org/10.1037/apl0000927

*Decuypere, A., & Pircher Verdorfer, A. (2022). Leader attentive communication: A new communication concept, validation and scale development. *Journal of Leadership & Organizational Studies*, *29*(4), 424-442. https://doi.org/10.1177/15480518221100922

*DeSimone, J. A., Harms, P. D., Vanhove, A. J., & Herian, M. N. (2017). Development and validation of the Five-by-Five Resilience Scale. *Assessment*, *24*(6), 778-797. https://doi.org/10.1177/1073191115625803

DeVellis, R. F. (2012). *Scale Development: Theory and Applications* (3rd ed.). Sage.

*Dhonau, S. (2020). *ACTFL Oral Proficiency Interview - Computer: Statistical Analysis & Evidence of Validity* (Report No. AAR/OPIc/ACE/I—2020-001). American Council on the Teaching of Foreign Languages.

*Dolbier, C. L., Cocke, R. R., Leiferman, J. A., Steinhardt, M. A., Schapiro, S. J., Nehete, P. N., Perlman, J. E., & Sastry, J. (2001). Differences in functional immune responses of high vs. low hardy healthy individuals. *Journal of Behavioral Medicine*, *24*(3), 219-229. https://doi.org/10.1023/a:1010762606006

*Drasgow, F., Stark, S., Chernyshenko, O. S., Nye, C. D., Hulin, C. L., & White, L. A. (2012). *Development of the Tailored Adaptive Personality Assessment System (TAPAS) to Support Army* (Technical Report 1311). United States Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. ADA564422).

*Drollinger, T., Comer, L. B., & Warrington, P. T. (2006). Development and validation of the Active Empathetic Listening Scale. *Psychology & Marketing*, *23*(2), 161-180. https://doi.org/10.1177/15480518221100922

*Dwyer, C. P., Hogan, M. J., & Steward, I. (2012). An evaluation of argument mapping as a method of enhancing critical thinking performance in e-learning environments. *Metacognition and Learning*, *7*(3), 219-244. https://doi.org/10.1007/s11409-012-9092-1

*Eid, J., Johnsen, B. H., Bartone, P. T., & Nissestad, O. A. (2008). Growing transformational leaders: Exploring the role of personality hardiness. *Leadership & Organization Development Journal*, *29*(1), 4-23. https://doi.org/10.1108/01437730810845270

Equal Employment Opportunity Commission. (1978). *Uniform Guidelines on Employee Selection Procedures*. https://www.govinfo.gov/content/pkg/CFR-2017-title29-vol4/xml/CFR-2017-title29-vol4-part1607.xml

*Escolas, S. M., Pitts, B. L., Safer, M. A., & Bartone, P. T. (2013). The protective value of hardiness on military posttraumatic stress symptoms. *Military Psychology*, *25*(2), 116-123. https://doi.org/10.1037/h0094953

* Educational Testing Service. (2022). *Test of English for International Communication (TOEIC) Speaking and Writing*. https://www.ets.org/toeic/organizations/speaking-writing/about

*Ferris, G. R., Treadway, D. C., Kolodinsky, R. W., Hochwarter, W. A., Kacmar, C. J., Douglas, C., & Frink, D. D. (2005). Development and validation of the Political Skill Inventory. *Journal of Management*, *31*(1), 126-152. https://doi.org/10.1177/0149206304271386

*Frisby, C. L. (1992). Construct validity and psychometric properties of the Cornell Critical Thinking Test (Level Z): A contrasted groups analysis. *Psychological Reports*, *71*(1), 291-303. https://doi.org/10.2466/PR0.71.5.291-303

*Furnham, A. (2017). Dark side correlates of job reliability and stress tolerance in two large samples. *Personality and Individual Differences*, *117*, 255-259. https://doi.org/10.1016/j.paid.2017.06.020

*Furnham, A., & Treglown, L. (2022). Bright and dark-side traits associated with interests in commerce vs science: Different personality profiles of the scientist-practitioner. *Psychological Reports*, *125*(3), 1667-1686. https://doi.org/10.1177/00332941211002134

*Furnham, A., Treglown, L., Hyde, G., & Trickey, G. (2016). The bright and dark side of altruism: Demographic, personality traits, and disorders associated with altruism. *Journal of Business Ethics*, *134*(3), 359-368. https://doi.org/10.1007/s10551-014-2435-x

*Fyhn, T., Fjell, K. K., & Johnsen, B. H. (2016). Resilience factors among police investigators: Hardiness-commitment a unique contributor. *Journal of Police and Criminal Psychology*, *31*(4), 261-269. https://doi.org/10.1007/s11896-015-9181-6

Gierl, M. J., & Lai, H. (2015). Automatic item generation. In S. Lane, M. R. Raymond, & T. M. Haladyna (Eds.), *Handbook of Test Development* (2nd ed., pp. 410-429). Routledge.

*Goff, K., & Torrance, E. P. (2002). *Abbreviated Torrance Test for Adults Manual*. Scholastic Testing Service.

*Goldberg, L. R. (2022, February 21). *International Personality Item Pool (IPIP)* [database]. https://ipip.ori.org/

Gonzalez, O. (2021). Psychometric and machine learning approaches for diagnostic assessment and tests of individual classification. *Psychological Methods*, *26*(2), 236-254. https://doi.org/10.1037/met0000317

Gonzalez-Mulé, E., & Aguinis, H. (2018). Advancing theory by assessing boundary conditions with metaregression: A critical review and best-practice recommendations. *Journal of Management*, *44*(6), 2246-2273. https://doi.org/10.1177/0149206317710723

*Gonzalez-Mulé, E., Mount, M. K., & Oh, I.-S. (2014). A meta-analysis of the relationship between general mental ability and nontask performance. *Journal of Applied Psychology*, *99*(6), 1222-1243. https://doi.org/10.1037/a0037547

Greco, L. M., O'Boyle, E. H., Cockburn, B. S., & Yuan, Z. (2018). Meta-analysis of coefficient alpha: A reliability generalization study. *Journal of Management Studies*, *55*(4), 584-618. https://doi.org/10.1111/joms.12328

*Grüning, D. J., & Lechner, C. M. (2023). Measuring six facets of curiosity in Germany and the UK: A German-language adaptation of the 5DCR and its comparability with the English-language source version. *Journal of Personality Assessment*, *105*(2), 283-295. https://doi.org/10.1080/00223891.2022.2057318

Guion, R. M. (2011). *Assessment, Measurement, and Prediction for Personnel Decisions* (2nd ed.). Routledge.

*Hayes, T. L., Roehm, H. A., & Castellano, J. P. (1994). Personality correlates of success in total quality manufacturing. *Journal of Business and Psychology*, *8*(4), 397-411. https://doi.org/10.1007/BF02230956

*Heaton, R. K., Akshoomoff, N., Tulsky, D., Mungas, D., Weintraub, S., Dikmen, S., Beaumont, J., Casaletto, K. B., Conway, K., Slotkin, J., & Gershon, R. (2014). Reliability and validity of composite scores from the NIH Toolbox Cognition Battery in adults. *Journal of the International Neuropsychological Society*, *20*(6), 588-598. https://doi.org/10.1017/S1355617714000241

Hedges, L. V., & Olkin, I. (1985). *Statistical Methods for Meta-Analysis*. Academic Press. https://doi.org/10.1016/C2009-0-03396-0

Heggestad, E. D., Scheaf, D. J., Banks, G. C., Monroe Hausfeld, M., Tonidandel, S., & Williams, E. B. (2019). Scale adaptation in organizational science research: A review and best-practice recommendations. *Journal of Management*, *45*(6), 2596-2627. https://doi.org/10.1177/0149206319850280

*HighMatch. (2022). *Listening Skills Assessment Test*. https://www.highmatch.com/talent-insights/skill-assessment/listening-skills-assessment-test/

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, *1*(1), 104-121. https://doi.org/10.1177/109442819800100106

*Hinyard, L., Toomey, E., Eliot, K., & Breitbach, A. (2019). Student perceptions of collaboration skills in an interprofessional context: Development and initial validation of the Self-Assessed Collaboration Skills instrument. *Evaluation & the Health Professions*, *42*(4), 450-472. https://doi.org/10.1177/0163278717752438

*Hire Success. (2022). *Pre-Employment Reading Comprehension Test*. https://www.hiresuccess.com/aptitude-tests/reading-comprehension-test-for-employment

*Hoffman, B. J., Melchers, K. G., Blair, C. A., Kleinmann, M., & Ladd, R. T. (2011). Exercises and dimensions are the currency of assessment centers. *Personnel Psychology*, *64*(2), 351-395. https://doi.org/10.1111/j.1744-6570.2011.01213.x

*Hogan. (2014). *Hogan Judgment Assessment Technical Manual*. http://www.hoganjudgment.com/

Hogan, J., & Roberts, B. W. (1996). Issues and non-issues in the fidelity–bandwidth trade-off. *Journal of Organizational Behavior*, *17*(6), 627-637. https://doi.org/10.1002/(SICI)1099-1379(199611)17:6%3C627::AID-JOB2828%3E3.0.CO;2-F

*Hogan, J., Rybicki, S. L., Motowidlo, S. J., & Borman, W. C. (1998). Relations between contextual performance, personality, and occupational advancement. *Human Performance*, *11*(2-3), 189-207. https://doi.org/10.1207/s15327043hup1102&3_5

*Hogan, R., & Hogan, J. (2007). *Hogan Personality Inventory Manual* (3rd ed.). Hogan. https://www.hoganassessments.com/assessment/hogan-personality-inventory/

*Hogan, R., Hogan, J., & Barrett, P. (2007). *Hogan Business Reasoning Inventory Manual*. Hogan. https://www.hoganassessments.com/products/hbri/

*Hommel, B. E., Ruppel, R., & Zacher, H. (2022). Assessment of cognitive flexibility in personnel selection: Validity and acceptance of a gamified version of the Wisconsin Card Sorting Test. *International Journal of Selection & Assessment*, *30*(1), 126-144. https://doi.org/10.1111/ijsa.12362

*Hoopsick, R. A., Homish, D. L., Collins, R. L., Nochajski, T. H., Read, J. P., & Homish, G. G. (2020). Is deployment status the critical determinant of psychosocial problems among Reserve/Guard Soldiers? *Psychological Services*, *17*(4), 461-471. https://doi.org/10.1037/ser0000331

*Hoopsick, R. A., Homish, D. L., Vest, B. M., Bartone, P. T., & Homish, G. G. (2021). Resilience to hazardous drinking among never-deployed male United States Army Reserve and National Guard Soldiers. *Alcoholism: Clinical and Experimental Research*, *45*(3), 566-576. https://doi.org/10.1111/acer.14561

Hough, L. M., Oswald, F. L., & Ployhart, R. E. (2001). Determinants, detection and amelioration of adverse impact in personnel selection procedures: Issues, evidence and lessons learned. *International Journal of Selection and Assessment*, *9*(1-2), 152-194. https://doi.org/10.1111/1468-2389.00171

*Houston, J. S., Borman, W. C., Farmer, W. F., & Bearden, R. M. (2006). *Development of the Navy Computer Adaptive Personality Scales (NCAPS)* (Report No. NPRST-TR-06-2). Navy Personnel Research, Studies, and Technology Division, Bureau of Naval Personnel.

*Howe, M. (2019). General mental ability and goal type as antecedents of recurrent adaptive task performance. *Journal of Applied Psychology*, *104*(6), 796-813. https://doi.org/10.1037/apl0000379

*Hua, J., Fan, J., Walker, A., Hou, N., Zheng, L., & Debode, J. (2019). Examinations of the role of individual adaptability in cross-cultural adjustment. *Journal of Career Assessment*, *27*(3), 490-509. https://doi.org/10.1177/1069072718765193

Hughes, G. L., & Prien, E. P. (1989). Evaluation of task and job skill linkage judgments used to develop test specifications. *Personnel Psychology*, *42*(2), 283-292. https://doi.org/10.1111/j.1744-6570.1989.tb00658.x

*Hystad, S. W., & Bye, H. H. (2013). Safety behaviours at sea: The role of personal values and personality hardiness. *Safety Science*, *57*, 19-26. https://doi.org/10.1016/j.ssci.2013.01.018

*Hystad, S. W., Eid, J., & Brevik, J. I. (2011). Effects of psychological hardiness, job demands, and job control on sickness absence: A prospective study. *Journal of Occupational Health Psychology*, *16*(3), 265-278. https://doi.org/10.1037/a0022904

*Hystad, S. W., Eid, J., Johnsen, B. H., Laberg, J. C., & Bartone, P. T. (2010). Psychometric properties of the revised Norwegian dispositional resilience (hardiness) scale. *Scandinavian Journal of Psychology*, *51*(3), 237-245. https://doi.org/10.1111/j.1467-9450.2009.00759.x

*Hystad, S. W., Eid, J., Laberg, J. C., & Bartone, P. T. (2011). Psychological hardiness predicts admission into Norwegian Military Officer schools. *Military Psychology*, *23*(4), 381-389. https://doi.org/ 10.1080/08995605.2011.589333

*Hystad, S. W., Eid, J., Laberg, J. C., Johnsen, B. H., & Bartone, P. T. (2009). Academic stress and health: Exploring the moderating role of personality hardiness. *Scandinavian Journal of Educational Research*, *53*(5), 421-429. https://doi.org/10.1080/00313830903180349

*Hystad, S. W., Olsen, O. K., Espevik, R., & Säfvenbom, R. (2015). On the stability of psychological hardiness: A three-year longitudinal study. *Military Psychology*, *27*(3), 155-168. https://doi.org/10.1037/mil0000069

*Industrial / Organizational Solutions. (2022). *National Criminal Justice Officer Selection Inventory Squared (NCJOSI²)*. https://iosolutions.com/national-criminal-justice-officer-selection-inventory-ncjosi2/

*Into Performance ULC. (2022). *Multifactor Measure of Performance (MMP3)*. https://www.mmp2perform.com

Jackson, G. T., Castellano, K. E., Brockway, D., & Lehman, B. (2018). Improving the measurement of cognitive skills through automated conversations. *Journal of Research on Technology in Education*, *50*(3), 226-240. https://doi.org/10.1080/15391523.2018.1452655

*Jansen, A., Melchers, K. G., Lievens, F., Kleinmann, M., Brändli, M., Fraefel, L., & König, C. J. (2013). Situation assessment as an ignored factor in the behavioral consistency paradigm underlying the validity of personnel selection procedures. *Journal of Applied Psychology*, *98*(2), 326-341. https://doi.org/10.1037/a0031257

*Johnsen, B. H., Eid, J., Pallesen, S., Bartone, P. T., & Nissestad, O. A. (2009). Predicting transformational leadership in Naval cadets: Effects of personality hardiness and training. *Journal of Applied Social Psychology*, *39*(9), 2213-2235. https://doi.org/10.1111/j.1559-1816.2009.00522.x

*Jones, S. M., Bodie, G. D., & Hughes, S. D. (2019). The impact of mindfulness on empathy, active listening, and perceived provisions of emotional support. *Communication Research*, *46*(6), 838-865. https://doi.org/10.1177/0093650215626983

*Jonsdottir, I. J., & Kristinsson, K. (2020). Supervisors' active-empathetic listening as an Important antecedent of work engagement. *International Journal of Environmental Research and Public Health*, *17*(21), Article 7976. https://doi.org/10.3390/ijerph17217976

Judge, T. A. (2022, August). *Measures*. Retrieved from http://www.timothy-judge.com/Measures.htm

Judge, T. A., & Kammeyer-Mueller, J. D. (2012). General and specific measures in organizational behavior research: Considerations, examples, and recommendations for researchers. *Journal of Organizational Behavior*, *33*(2), 161-174. https://doi.org/10.1002/job.764

Judge, T. A., & Zapata, C. P. (2015). The person-situation debate revisited: Effect of situation strength and trait activation on the validity of the Big Five personality traits in predicting job performance. *Academy of Management Journal*, *58*(4), 1149-1179. https://doi.org/10.5465/amj.2010.0837

Judge, T. A., Rodell, J. B., Klinger, R. L., Simon, L. S., & Crawford, E. R. (2013). Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives. *Journal of Applied Psychology*, *98*(6), 875-925. https://doi.org/10.1037/a0033901

*Kaiser, R. B., & Hogan, J. (2011). Personality, leader behavior, and overdoing it. *Consulting Psychology Journal: Practice and Research*, *63*(4), 219-242. https://doi.org/10.1037/a0026795

Kane, M. (1997). Model-based practice analysis and test specifications. *Applied Measurement in Education*, *10*(1), 5-18. https://doi.org/10.1207/s15324818ame1001_1

*Kantrowitz, T., Kingry, D., Madaj, C., & Nye, C. (2019). *Navy Computerized Adaptive Personality Scales* (Report No. AFRL-RH-WP-TR-2019-0095). Air Force Research Laboratory.

*Karr, J. E., Scott, T. M., Aghvinian, M., & Rivera Mindt, M. (2022). Harmonization of the English and Spanish versions of the NIH Toolbox Cognition Battery Crystallized and Fluid composite scores. *Neuropsychology*. Advance online publication. https://doi.org/10.1037/neu0000822

*Karwowski, M., Dul, J., Gralewski, J., Jauk, E., Jankowska, D. M., Gajda, A., … Benedek, M. (2016). Is creativity without intelligence possible? A necessary condition analysis. *Intelligence*, 57, 105-117. https://doi.org/10.1016/j.intell.2016.04.006

*Kashdan, T. B., Disabato, D. J., Goodman, F. R., & McKnight, P. E. (2020). The Five-Dimensional Curiosity Scale Revised (5DCR): Briefer subscales while separating overt and covert social curiosity. *Personality and Individual Differences*, *157*, Article 109836. https://doi.org/10.1016/j.paid.2020.109836

*Kashdan, T. B., Goodman, F. R., Disabato, D. J., McKnight, P. E., Kelso, K., & Naughton, C. (2020). Curiosity has comprehensive benefits in the workplace: Developing and validating a multidimensional workplace curiosity scale in United States and German employees. *Personality and Individual Differences*, *155*, Article 109717. https://doi.org/10.1016/j.paid.2019.109717

*Kashdan, T. B., Stiksma, M. C., Disabato, D. J., McKnight, P. E., Bekier, J., Kaji, J., & Lazarus, R. (2018). The Five-Dimensional Curiosity Scale: Capturing the bandwidth of curiosity and identifying four unique subgroups of curious people. *Journal of Research in Personality*, 73, 130-149. https://doi.org/10.1016/j.jrp.2017.11.011

*Kelly, D. R., Matthews, M. D., & Bartone, P. T. (2014). Grit and hardiness as predictors of performance among West Point Cadets. *Military Psychology*, *26*(4), 327-342. https://doi.org/10.1037/mil0000050

Kenny, D. A. (2019). Enhancing validity in psychological research. *American Psychologist*, *74*(9), 1018-1028. https://doi.org/10.1037/amp0000531

*Keskin Samancı, N. (2015). A study on the link between moral judgment competences and critical thinking skills. *International Journal of Environmental and Science Education*, *10*(2), 135-143. https://doi.org/10.12973/ijese.2015.236a

*Kirchmeyer, C. (1993). Multicultural task groups: An account of the low contribution level of minorities. *Small Group Research*, *24*(1), 127-148. https://doi.org/10.1177/1046496493241009

*Kisamore, J. L., Stone, T. H., & Jawahar, I. M. (2007). Academic integrity: The relationship between individual and situational factors on misconduct contemplations. *Journal of Business Ethics*, *75*(4), 381-394. https://doi.org/10.1007/s10551-006-9260-9

Kjell, O. N., Kjell, K., Garcia, D., & Sikström, S. (2019). Semantic measures: Using natural language processing to measure, differentiate, and describe psychological constructs. *Psychological Methods*, *24*(1), 92-115. https://doi.org/10.1037/met0000191

*Ko, E., Kim, H. Y., Bartone, P. T., & Kang, H. S. (2018). Reliability and validity of the Korean version of the 15-item Dispositional Resilience Scale. *Psychology, Health & Medicine*, *23*(S1), 1287-1298. https://doi.org/10.1080/13548506.2017.1417612

*Kowalski, C. M., & Schermer, J. A. (2019). Hardiness, perseverative cognition, anxiety, and health-related outcomes: A case for and against psychological hardiness. *Psychological Reports*, *122*(6), 2096-2118. https://doi.org/10.1177/0033294118800444

*Kulak, J. A., Homish, D. L., Hoopsick, R. A., Fillo, J., Bartone, P. T., & Homish, G. G. (2021). Hardiness protects against problematic alcohol use in male, but not female, Soldiers. *Psychological Services*, *18*(3), 426-432. https://doi.org/10.1037/ser0000409

*Kwon, H. W. (2020). Performance appraisal politics in the public sector: The effects of political skill and social similarity on performance rating. *Public Personnel Management*, *49*(2), 239-261. https://doi.org/10.1177/0091026019859906

*Lafontaine, J., & Cyr, M. (2016). A study of the relationship between investigators' personal characteristics and adherence to interview best practices in training. *Psychiatry, Psychology and Law*, *23*(5), 782-797. https://doi.org/10.1080/13218719.2016.1152925

*Lall, R., Holmes, E. K., Brinkmeyer, K. R., Johnson, W. B., & Yatko, B. R. (1999). Personality characteristics of future military leaders. *Military Medicine*, *164*(12), 906-910. https://doi.org/ 10.1093/milmed/164.12.906

*Landers, R. N., Armstrong, M. B., Collmus, A. B., Mujcic, S., & Blaik, J. (2022). Theory-driven game-based assessment of general cognitive ability: Design theory, measurement, prediction of performance, and test fairness. *Journal of Applied Psychology*, *107*(10), 1655-1677. https://doi.org/10.1037/apl0000954

Landy, F. J. (1986). Stamp collecting versus science: Validation as hypothesis testing. *American Psychologist*, *41*(11), 1183.

*Language Testing International. (2022a). *ACTFL Listening Proficiency Test (LPT)*. https://www.languagetesting.com/listening-proficiency-test

* Language Testing International. (2022b). *ACTFL Reading Proficiency Test (RPT)*. https://www.languagetesting.com/reading-proficiency-test

* Language Testing International. (2022c). *ACTFL Speaking Assessment: The Oral Proficiency Interview (OPI)*. https://www.languagetesting.com/oral-proficiency-interview-opi

* Language Testing International. (2022d). *ACTFL Writing Proficiency Test (WPT)*. https://www.languagetesting.com/writing-proficiency-test

LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 Questions About Interrater Reliability and Interrater Agreement. *Organizational Research Methods*, *11*(4), 815–852. https://doi.org/10.1177/1094428106296642

*Li, Z., Yang, Y., Zhang, X., & Lyu, Z. (2021). Impact of future work self on employee workplace wellbeing: A self-determination perspective. *Frontiers in Psychology*, *12*, Article 656874. https://doi.org/10.3389/fpsyg.2021.656874

*Liao, C.-W., & Qu, Y. (2010). Alternate forms test-retest reliability and test score changes for the TOEIC Speaking and Writing Tests. In *The Research Foundation for the TOEIC Tests: A Compendium of Studies* (Vol. I). Educational Testing Service. http://www.ets.org/Media/Research/pdf/TC-10-10.pdf

*Liao, C.-W., & Wei, Y. (2010). Statistical analyses for the TOEIC Speaking and Writing pilot study. In *The Research Foundation for the TOEIC Tests: A Compendium of Studies* (Vol. I). Educational Testing Service. http://www.ets.org/Media/Research/pdf/TC-10-09.pdf

Liao, H.-Y., Armstrong, P. I., Rounds, J., & Su, R. (2007). *Interest Item Pool (IIP)* [Database]. https://www.jrounds.weebly.com/

*Lloyd, K. J., Boer, D., & Voelpel, S. C. (2017). From listening to leading: Toward an understanding of supervisor listening within the framework of Leader-Member Exchange Theory. *International Journal of Business Communication*, *54*(4), 431-451. https://doi.org/10.1177/2329488415572778

*Lohman, M. C. (2004). The development of a multirater instrument for assessing employee problem-solving skill. *Human Resource Development Quarterly*, *15*(3), 303-321. https://doi.org/10.1002/hrdq.1105

*Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology*, *79*(3), 381-391. https://doi.org/10.1037/0021-9010.79.3.381

Madden, A., Bailey, C., Alfes, K., & Fletcher, L. (2018). Using narrative evidence synthesis in HRM research: An overview of the method, its application, and the lessons learned. *Human Resource Management*, *57*(2), 641-657. https://doi.org/10.1002/hrm.21858

Magnusen, M. J., Mondello, M., Kyoum Kim, Y., & Ferris, G. R. (2011). Roles of recruiter political skill, influence strategy, and organization reputation in recruitment effectiveness in college sports. *Thunderbird International Business Review*, *53*(6), 687-700. https://doi.org/10.1002/tie.20445

*Maltby, J., & Hall, S. S. (2022). Less is more. Discovering the latent factors of trait resilience. *Journal of Research in Personality*, *97*, Article 104193. https://doi.org/10.1016/j.jrp.2022.104193

*Manz, C. C., & Sims, H. P. (1987). Leading workers to lead themselves: The external leadership of self-managing work teams. *Administrative Science Quarterly*, *32*(1), 106-129. https://doi.org/10.2307/2392745

*Martin, J. H., Montgomery, R. L., & Saphian, D. (2006). Personality, achievement test scores, and high school percentile as predictors of academic performance across four years of coursework. *Journal of Research in Personality*, *40*(4), 424-431. https://doi.org/10.1016/j.jrp.2005.02.001

*Martin, M. M., & Rubin, R. B. (1995). A new measure of cognitive flexibility. *Psychological Reports*, *76*(2), 623-626. https://doi.org/10.2466/pr0.1995.76.2.623

*Martin, M. M., Anderson, C. M., & Thweatt, K. S. (1998). Aggressive communication traits and their relationships with the cognitive flexibility scale and the communication flexibility scale. *Journal of Social Behavior & Personality*, *13*(3), 531-540. Retrieved from https://psycnet.apa.org/record/2000-02090-010

*Massei, A. (2020). *ACTFL Oral Proficiency Interview: Statistical Analysis & Evidence of Validity* (Report No. AAR/OPI/ACE/I-2020-001). American Council on the Teaching of Foreign Languages.

Matthews, R. A., Pineault, L., & Hong, Y.-H. (2022). Normalizing the use of single-item measures: Validation of the single-item compendium for organizational psychology. *Journal of Business and Psychology*, *37*(4), 639-673. https://doi.org/10.1007/s10869-022-09813-3

Mayer, R. C., & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment. *Journal of Applied Psychology*, *84*(1), 123-136. https://doi.org/10.1037/0021-9010.84.1.123

*McCalister, K. T., Dolbier, C. L., Webster, J. A., Mallon, M. W., & Steinhardt, M. A. (2006). Hardiness and support at work as predictors of work stress and job satisfaction. *American Journal of Health Promotion*, *20*(3), 183-191. https://doi.org/10.4278/0890-1171-20.3.183

*Meier, M. A., Burgstaller, J. A., Benedek, M., Vogel, S. E., & Grabner, R. H. (2021). Mathematical creativity in adults: Its measurement and its relation to intelligence, mathematical competence and general creativity. *Journal of Intelligence*, *9*(1), Article 10. https://doi.org/10.3390/jintelligence9010010

*Merz, Z. C., Lace, J. W., & Eisenstein, A. M. (2022). Examining broad intellectual abilities obtained within an mTurk internet sample. *Current Psychology*, *41*(4), 2241-2249. https://doi.org/10.1007/s12144-020-00741-0

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist, 50*, 741-749.

Mezo, P. G. (2009). The Self-Control and Self-Management scale (SCMS): Development of an adaptive self-regulatory coping skills instrument. *Journal of Psychopathology and Behavioral Assessment*, *31*(2), 83-93. https://doi.org/10.1007/s10862-008-9104-2

McCroskey, J. C., & McCroskey, L. L. (1988). Self-report as an approach to measuring communication competence. *Communication Research Reports*, *5*(2), 108–113. https://doi.org/10.1080/08824098809359810

McGinnis, D. (2016). Epistemological orientations and evidence evaluation in undergraduates. *Thinking Skills and Creativity*, *19*, 279–289. https://doi.org/10.1016/j.tsc.2016.01.002

*Millikin, J. P., Hom, P. W., & Manz, C. C. (2010). Self-management competencies in self-managing teams: Their impact on multi-team system productivity. *The Leadership Quarterly*, *21*(5), 687-702. https://doi.org/10.1016/j.leaqua.2010.07.001

*Miron, E., Erez, M., & Naveh, E. (2004). Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other? *Journal of Organizational Behavior*, *25*(2), 175-199. https://doi.org/10.1002/job.237

*Miron-Spektor, E., Erez, M., & Naveh, E. (2011). The effect of conformist and attentive-to-detail members on team innovation: Reconciling the innovation paradox. *Academy of Management Journal*, *54*(4), 740-760. https://doi.org/10.5465/AMJ.2011.64870100

*Mitchell, T., Lemoine, G. J., & Lee, D. (2022). Inclined but less skilled? Disentangling extraversion, communication skill, and leadership emergence. *Journal of Applied Psychology*, *107*(9), 1524-1542. https://doi.org/10.1037/apl0000962

*Momm, T., Blickle, G., & Liu, Y. (2013). Political skill and emotional cue learning via voices: A training study. *Journal of Applied Social Psychology*, *43*(11), 2307-2317. https://doi.org/10.1111/jasp.12180

*Momm, T., Blickle, G., Liu, Y., Wihler, A., Kholin, M., & Menges, J. I. (2015). It pays to have an eye for emotions: Emotion recognition ability indirectly predicts annual income. *Journal of Organizational Behavior*, *36*(1), 147-163. https://doi.org/10.1002/job.1975

Morgeson, F. P., Brannick, M. T., & Levine, E. L. (2020). *Job and Work Analysis: Methods, Research, and Applications for Human Resource Management* (3rd ed.). Sage.

*Mount, M. K., Oh, I.-S., & Burns, M. (2008). Incremental validity of perceptual speed and accuracy over general mental ability. *Personnel Psychology*, *61*(1), 113-139. https://doi.org/10.1111/j.1744-6570.2008.00107.x

*Mumford, M. D., Marks, M. A., Connelly, M. S., Zaccaro, S. J., & Reiter-Palmon, R. (2000). Development of leadership skills: Experience and timing. *The Leadership Quarterly*, *11*(1), 87-114. https://doi.org/10.1016/S1048-9843(99)00044-2

*Munyon, T. P., Summers, J. K., Thompson, K. M., & Ferris, G. R. (2015). Political skill and work outcomes: A theoretical extension, meta-analytic investigation, and agenda for the future. *Personnel Psychology*, *68*(1), 143-184. https://doi.org/10.1111/peps.12066

*Murphy, S. E., & Ensher, E. A. (2001). The role of mentoring support and self-management strategies on reported career outcomes. *Journal of Career Development*, *27*(4), 229-246. https://doi.org/10.1177/089484530102700401

*National Institutes of Health. (2022). *NIH Toolbox - Cognition Battery*. https://www.healthmeasures.net/explore-measurement-systems/nih-toolbox

*Nowicki, S. (2015). *Manual for the Receptive Tests of the Diagnostic Analysis of Nonverbal Accuracy 2 (DANVA2)*. Emory University. https://www.stephennowicki.com/danva

*Nowicki, S., & Carton, J. (1993). The measurement of emotional intensity from facial expressions. *The Journal of Social Psychology*, *133*(5), 749-750. https://doi.org/10.1080/00224545.1993.9713934

*Nowicki, S., & Duke, M. P. (1994). Individual differences in the nonverbal communication of affect: The Diagnostic Analysis of Nonverbal Accuracy Scale. *Journal of Nonverbal Behavior*, *18*(1), 9-35. https://doi.org/10.1007/BF02169077

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). McGraw-Hill.

*Nye, C. D., Beal, S. A., Drasgow, F., Dressel, J. D., White, L. A., & Stark, S. (2014). *Assessing the Tailored Adaptive Personality Assessment System for Army Special Operations Forces Personnel* (Research Report 1971). U. S. Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. ADA596904).

*Nye, C. D., White, L. A., Horgen, K., Drasgow, F., Stark, S., & Chernyshenko, O. S. (2020). Predictors of attitudes and performance in U.S. Army recruiters: Does personality matter? *Military Psychology*, *32*(1), 81-90. https://doi.org/10.1080/08995605.2019.1652486

Oh, I.-S. (2020). Beyond meta-analysis: Secondary uses of meta-analytic data. *Annual Review of Organizational Psychology and Organizational Behavior*, *7*, 125-153. https://doi.org/10.1146/annurev-orgpsych-012119-045006

*Olaru, G., Burrus, J., MacCann, C., Zaromb, F. M., Wilhelm, O., & Roberts, R. D. (2019). Situational judgment tests as a method for measuring personality: Development and validity evidence for a test of dependability. *PLoS ONE*, *14*(2), Article e0211884. https://doi.org/10.1371/journal.pone.0211884

*Olderbak, S., Riggenmann, O., Wilhelm, O., & Doebler, P. (2021). Reliability generalization of tasks and recommendations for assessing the ability to perceive facial expressions of emotion. *Psychological Assessment*, *33*(10), 911-926. https://doi.org/10.1037/pas0001030

Ones, D. S., & Viswesvaran, C. (1996). Bandwidth-Fidelity Dilemma in personality measurement for personnel selection. *Journal of Organizational Behavior*, *17*(6), 609-626. https://doi.org/10.1002/(SICI)1099-1379(199611)17:6%3C609::AID-JOB1828%3E3.0.CO;2-K

Ones, D. S., Viswesvaran, C., & Schmidt, F. L. (2017). Realizing the full potential of psychometric meta-analysis for a cumulative science and practice of human resource management. *Human Resource Management Review*, *27*(1), 201-215. https://doi.org/10.1016/j.hrmr.2016.09.011

*Orakcı, Ş. (2021). Exploring the relationships between cognitive flexibility, learner autonomy, and reflective thinking. *Thinking Skills and Creativity*, *41*, Article 100838. https://doi.org/10.1016/j.tsc.2021.100838

*Parke, M. R., Weinhardt, J. M., Brodsky, A., Tangirala, S., & DeVoe, S. E. (2018). When daily planning improves employee performance: The importance of planning type, engagement, and interruptions. *Journal of Applied Psychology*, *103*(3), 300-312. https://doi.org/10.1037/apl0000278

*Pearson. (2022). *Watson-Glaser Critical Thinking Appraisal*. https://www.pearson.com/en-us/efficacy/product-evidence/watson-glaser.html

*Ployhart, R. E., & Bliese, P. D. (2006). Individual Adaptability (I-ADAPT) Theory: Conceptualizing the antecedents, consequences, and measurement of individual differences in adaptability. In S. C. Burke, L. G. Pierce, & E. Salas (Eds.), *Advances in*

Human Performance and Cognitive Engineering Research: Understanding Adaptability: A Prerequisite for Effective Performance within Complex Environments (Vol. 6, pp. 3-39). Emerald. https://doi.org/10.1016/S1479-3601(05)06001-7

Ployhart, R. E., & Holtz, B. C. (2008). The Diversity-Validity Dilemma: Strategies for reducing racioethnic and sex subgroup differences and adverse impact in selection. *Personnel Psychology*, *61*(1), 153-172. https://doi.org/10.1111/j.1744-6570.2008.00109.x

*Qian, J., Wang, B., Song, B., Li, X., Wu, L., & Fang, Y. (2019). It takes two to tango: The impact of leaders' listening behavior on employees' feedback seeking. *Current Psychology*, *38*(3), 803-810. https://doi.org/10.1007/s12144-017-9656-y

*Qu, Y., & Ricker-Pedley, K. L. (2013). Monitoring Individual Rater Performance for the TOEIC Speaking and Writing Tests. In D. E. Powers (Ed.), *The Research Foundation for the TOEIC Tests: A Compendium of Studies* (Vol. II). ETS. http://www.ets.org/Media/Research/pdf/TC2-09.pdf

*Qu, Y., Cid, J., Chan, E., & Huo, Y. (2017). Statistical analyses for the expanded TOEIC® Speaking Test. In D. P. Powers, & J. E. Schmidgall (Eds.), *The Research Foundation for the TOEIC Tests: A Compendium of Studies* (Vol. III). Educational Testing Service. https://www.ets.org/Media/Research/pdf/RM-17-03.pdf

*Ramsey, R. P., & Sohi, R. S. (1997). Listening to your customers: The impact of perceived salesperson listening behavior on relationship outcomes. *Journal of the Academy of Marketing Science*, *25*(2), 127-137. https://doi.org/10.1007/BF02894348

*Rapp, A. A., Bachrach, D. G., & Rapp, T. L. (2013). The influence of time management skill on the curvilinear relationship between organizational citizenship behavior and task performance. *Journal of Applied Psychology*, *98*(4), 668-677. https://doi.org/10.1037/a0031733

Ravand, H., & Baghaei, P. (2020). Diagnostic classification models: Recent developments, practical issues, and proposals. *International Journal of Testing*, *20*(1), 24-56. https://doi.org/10.1080/15305058.2019.1588278

Raymond, M. R. (2001). Job analysis and the specification of content for licensure and certification examinations. *Applied Measurement in Education*, *14*(4), 369-415. https://doi.org/10.1207/S15324818AME1404_4

*Renn, R. W., Allen, D. G., & Huning, T. M. (2011). Empirical examination of the individual-level personality-based theory of self-management failure. *Journal of Organizational Behavior*, *32*(1), 25-43. https://doi.org/10.1002/job.667

Riggio, R. E. (2005). The Social Skills Inventory (SSI): Measuring nonverbal and social skills. In V. L. Manusov (Ed.), *The Sourcebook of Nonverbal Measures: Going Beyond Words* (pp. 25-33). Routledge.

Robinson, M. A. (2018). Using multi-item psychometric scales for research and practice in human resource management. *Human Resource Management*, *57*(3), 739-750. https://doi.org/10.1002/hrm.21852

Robinson-Morral, E. J., Hendrickson, C., Gilbert, S., Myers, T., Simpson, K., & Loignon, A. C. (2018). Practical considerations for conducting job analysis linkage exercises. *Journal of Personnel Psychology*, *17*(1), 12-21. https://doi.org/10.1027/1866-5888/a000191

*Rodrigues Franco, A., Soares Costa, P., & da Silva Almeida, L. (2018). Translation, adaptation, and validation of the Halpern Critical Thinking Assessment to Portugal: Effect of disciplinary area and academic level on critical thinking. *Anales de Psicología*, *34*(2), 292-298. https://doi.org/10.6018/analesps.34.2.272401

Roth, P. L., Van Iddekinge, C. H., DeOrtentiis, P. S., Hackney, K. J., Zhang, L., & Buster, M. A. (2017). Hispanic and Asian performance on selection procedures: A narrative and meta-analytic review of 12 common predictors. *Journal of Applied Psychology*, *102*(8), 1178-1202. https://doi.org/10.1037/apl0000195

Royston, R. P., Goodwin, G. F., Ness, A. M., Keil, C. T., Lockhart, P. G., & Jones, M. (2022). *Army Talent Attribute Framework: A Unified Framework for Defining Personnel Characteristics* (Technical Report 1421). U. S. Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. AD1190814).

Royston, R. P., & Lin, N. (2022). *Army-wide Job Analysis for Officers: Branch and Functional Area-specific Knowledge, Skills, and Behaviors Requirements from the Army Talent Attribute Framework* (Vol. 1, Technical Report 1425). U. S. Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. AD1194370).

*Rubin, R. B. (1985). The validity of the Communication Competency Assessment Instrument. *Communication Monographs*, *52*(2), 173-185. https://doi.org/10.1080/03637758509376103

*Rubin, R. B., & Graham, E. E. (1988). Communication correlates of college success: An exploratory investigation. *Communication Education*, *37*(1), 14-27. https://doi.org/10.1080/03634528809378700

*Runco, M. A., Millar, G., Acar, S., & Cramond, B. (2010). Torrance tests of creative thinking as predictors of personal and public achievement: A fifty-year follow-up. *Creativity Research Journal*, *22*(4), 361-368. https://doi.org/10.1080/10400419.2010.523393

Rupp, D. E., Song, Q. C., & Strah, N. (2020). Addressing the so-called validity–diversity trade-off: Exploring the practicalities and legal defensibility of Pareto-optimization for reducing adverse impact within personnel selection. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, *13*(2), 246-271. https://doi.org/10.1017/iop.2020.19

Russell, T. L., & Peterson, N. G. (2007). Measurement plans and specifications. In D. L. Whetzel, & G. R. Wheaton, *Applied Measurement: Industrial Psychology in Human Resources Management* (pp. 97-130). Routledge.

*Ryan, A., Ployhart, R. E., Greguras, G. J., & Schmit, M. J. (1998). Test preparation programs in selection contexts: Self-selection and program effectiveness. *Personnel Psychology*, *51*(3), 599-621. https://doi.org/10.1111/j.1744-6570.1998.tb00253.x

Sager, C. E., Peterson, N. G., Oppler, S. H., Rosse, R. L., & Walker, C. B. (1997). An examination of five indexes of test battery performance: Analysis of the ECAT battery. *Military Psychology*, *9*(1), 97-120. https://doi.org/10.1207/s15327876mp0901_6

*Said-Metwaly, S., Kyndt, E., & Van den Noortgate, W. (2020). The factor structure of the Verbal Torrance Test of Creative Thinking in an Arabic context: Classical test theory and multidimensional item response theory analyses. *Thinking Skills and Creativity*, *35*, Article 100609. https://doi.org/10.1016/j.tsc.2019.100609

Salgado, J. F., Moscoso, S., Sanchez, J. I., Alonso, P., Choragwicka, B., & Berges, A. (2015). Validity of the five-factor model and their facets: The impact of performance measure and facet residualization on the bandwidth-fidelity dilemma. *European Journal of Work and Organizational Psychology*, *24*(3), 325-349. https://doi.org/10.1080/1359432X.2014.903241

*Sandvik, A. M., Bartone, P. T., Hystad, S. W., Phillips, T. M., Thayer, J. F., & Johnsen, B. H. (2013). Psychological hardiness predicts neuroimmunological responses to stress. *Psychology, Health, & Medicine*, *18*(6), 705-713. https://doi.org/10.1080/13548506.2013.772304

*Sanger, M. R., Ferrell, B. T., Nei, D. S., & Cruickshank, L. A. (2019). The agency paradox: What personality and multirater-assessment data tell us about leader success in Japan. *Consulting Psychology Journal: Practice and Research*, *71*(4), 270-287. https://doi.org/10.1037/cpb0000146

*Saville and Holdsworth LTD (SHL). (2022). *Time Management Test*. https://online.shl.com/gb/en-gb/products/timemanagement

Scherbaum, C. A. (2005). Synthetic validity: Past, present, and future. *Personnel Psychology*, *58*(2), 481-515. https://doi.org/10.1111/j.1744-6570.2005.00547.x

*Schmidgall, J., & Powers, D. E. (2020). TOEIC® Writing test scores as indicators of the functional adequacy of writing in the international workplace: Evaluation by linguistic laypersons. *Assessing Writing*, *46*, 1-13. https://doi.org/10.1016/j.asw.2020.100492

*Schmidgall, J., & Powers, D. E. (2021). Predicting communicative effectiveness in the international workplace: Support for TOEIC® Speaking test scores from linguistic laypersons. *Language Testing*, *38*(2), 302-325. https://doi.org/10.1177/0265532220941803

Schmidt, F. L., & Hunter, J. E. (2015). *Methods of Meta-Analysis* (3rd ed.). Sage.

*Schuhfried. (2010). *Halpern Critical Thinking Assessment*. https://schuhfried.com/vienna-test-system/tests-and-test-sets/

*Schuhfried. (2022). *WAF - Perception and Attention Functions Battery*. https://marketplace.schuhfried.com/en/WAF

Sebastian Reiche, B., Cardona, P., Lee, Y.-T., Canela, M. A., Akinnukawae, E., Briscoe, J. P., Bullara, C., Caparas, M. V., Caprar, D. V., Charlemagne, D., Grenness, T., He, W., Jamro, K., Kainzbauer, A., Koester, K., Lazo, A., Moreno, A., Morley, M. J., Myloni, V., . . . Wilkinson, H. (2014). Why do managers engage in trustworthy behavior? A multilevel cross-cultural study in 18 countries. *Personnel Psychology*, *67*(1), 61-98. https://doi.org/10.1111/peps.12038

Sessoms, J., & Henson, R. A. (2018). Applications of diagnostic classification models: A literature review and critical commentary. *Measurement: Interdisciplinary Research and Perspectives*, *16*(1), 1-17. https://doi.org/10.1080/15366367.2018.1435104

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference* (2nd ed.). Cengage.

*Shi, J., Chen, Z., & Zhou, L. (2011). Testing differential mediation effects of sub-dimensions of political skills in linking proactive personality to employee performance. *Journal of Business and Psychology*, *26*(3), 359-369. https://doi.org/10.1007/s10869-010-9195-0

Shultz, K. S., & Whitney, D. J. (2005). *Measurement Theory in Action*. Sage.

Siddaway, A. P., Wood, A. M., & Hedges, L. V. (2019). How to do a systematic review: A best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses. *Annual Review of Psychology*, *70*, 747-770. https://doi.org/10.1146/annurev-psych-010418-102803

Smither, J. W., London, M., & Reilly, R. R. (2005). Does performance improve following multisource feedback? A theoretical model, meta-analysis, and review of empirical findings. *Personnel psychology*, *58*(1), 33-66. http://dx.doi.org/10.1111/j.1744-6570.2005.514_1.x

Society for Industrial and Organizational Psychology. (2018). *Principles for the Validation and use of Personnel Selection Procedures* (5th ed.). American Psychological Association. https://www.apa.org/ed/accreditation/about/policies/personnel-selection-procedures.pdf

*Soderstrom, M., Dolbier, C., Leiferman, J., & Steinhardt, M. (2000). The relationship of hardiness, coping strategies, and perceived stress to symptoms of illness. *Journal of Behavioral Medicine*, *23*(3), 311-328. https://doi.org/10.1023/A:1005514310142

Song, Q. C., Liu, M., Tang, C., & Long, L. F. (2020). Applying principles of big data to the workplace and talent analytics. In S. E. Woo, L. Tay, and R. W. Proctor (Eds.), *Big Data*

in Psychological Research (pp. 319-344). American Psychological Association. https://www.apa.org/pubs/books/big-data-psychological-research

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology*, *113*(1), 117-143. https://doi.org/10.1037/pspp0000096

Spector, P. (2022, August). *Assessment Resources and Websites* [Database]. Retrieved from https://paulspector.com/assessments/instrument-resources/

*Speer, A. B., Christiansen, N. D., & Laginess, A. J. (2019). Social intelligence and interview accuracy: Individual differences in the ability to construct interviews and rate accurately. *International Journal of Selection and Assessment*, *27*(2), 104-128. https://doi.org/10.1111/ijsa.12237

*Speer, A. B., Tenbrink, A. P., Schwendeman, M. G., & Wegmeyer, L. J. (2020). Individual differences in effective interview design: Factors affecting question choice. *International Journal of Selection & Assessment*, *28*(3), 310-321. https://doi.org/10.1111/ijsa.12297

Speer, A. R., Christiansen, N. D., Robie, C., & Jacobs, R. R. (2022). Measurement specificity with modern methods: Using dimensions, facets, and items from personality assessments to predict performance. *Journal of Applied Psychology*, *107*(8), 1428-1439. https://doi.org/10.1037/apl0000618

Spray, J. A., & Huang, C.-Y. (2000). Obtaining test blueprint weights from job analysis surveys. *Journal of Educational Measurement*, *37*(3), 187-201. https://doi.org/10.1111/j.1745-3984.2000.tb01082.x

Steel, P., Schmidt, J., Bosco, F., & Uggerslev, K. (2019). The effects of personality on job satisfaction and life satisfaction: A meta-analytic investigation accounting for bandwidth–fidelity and commensurability. *Human Relations*, *72*(2), 217-247. https://doi.org/10.1177%2F0018726718771465

*Steinhardt, M. A., Dolbier, C. L., Gottlieb, N. H., & McCalister, K. T. (2003). The relationship between hardiness, supervisor support, group cohesion, and job stress as predictors of job satisfaction. *American Journal of Health Promotion*, *17*(6), 382-389. https://doi.org/10.4278/0890-1171-17.6.382

*Steinke, A., Kopp, B., & Lange, F. (2021). The Wisconsin Card Sorting Test: Split-half reliability estimates for a self-administered computerized variant. *Brain Sciences*, *11*(5), Article 529. https://doi.org/10.3390/brainsci11050529

*Stevenor, B. A., Zickar, M. J., Wimbush, F., & Beck, W. (2022). The Attention to Detail Test: Measurement precision and validity evidence for a performance-based assessment of attention to detail. *Personnel Assessment & Decisions*, *8*(1), 50-61. https://doi.org/10.25035/pad.2022.01.006

Stone, D. L., & Rosopa, P. J. (2017). The advantages and limitations of using meta-analysis in human resource management research. *Human Resource Management Review*, *27*(1), 1-7. https://doi.org/10.1016/j.hrmr.2016.09.001

*Surface, E. A., & Dierdorff, E. C. (2003). Reliability and the ACTFL Oral Proficiency Interview: Reporting indices of interrater consistency and agreement for 19 languages. *Foreign Language Annals*, *36*(4), 507-519. https://doi.org/10.1111/j.1944-9720.2003.tb02140.x

*Surface, E. A., Poncheri, R. M., & Bhavsar, K. S. (2008). *Two Studies Investigating the Reliability and Validity of the English ACTFL OPIc® with Korean Test Takers*. Surface, Ward & Associates

Sussmann, M., & Robertson, D. U. (1986). The validity of validity: An analysis of validation study designs. *Journal of Applied Psychology*, *71*(3), 461-468. https://doi.org/10.1037/0021-9010.71.3.461

*Talogy. (2022a). *The Resilience Questionnaire*. https://www.talogy.com/en/talent-management-solutions/assessments/resilience-questionnaire/

*Talogy. (2022b). *Virtual Assessment Center*. https://www.talogy.com/en/talent-management-solutions/assessments/virtual-business-simulations/

*Teng, E., Zhang, L., & Lou, M. (2020). I am talking but are you listening? The effects of challenge and hindrance stressors on effective communication. *Human Performance*, *33*(4), 241-257. https://doi.org/10.1080/08959285.2020.1724111

*Teng, Y., Brannick, M. T., & Borman, W. C. (2020). Capturing resilience in context: Development and validation of a situational judgment test of resilience. *Human Performance*, *33*(2-3), 74-103. https://doi.org/10.1080/08959285.2019.1709069

*The Critical Thinking Company. (2022). *Cornell Critical Thinking Tests*. https://www.criticalthinking.com/cornell-critical-thinking-tests.html

*The International Cognitive Ability Resource Team. (2014). *International Cognitive Ability Resource (ICAR)* [Database]. https://www.icar-project.com/

*Thomassen, Å. G., Hystad, S. W., Johnsen, B. H., Johnsen, G. E., & Bartone, P. T. (2018). The effect of hardiness on PTSD symptoms: A prospective mediational approach. *Military Psychology*, *30*(2), 142-151. https://doi.org/10.1080/08995605.2018.1425065

*Thomassen, Å. G., Hystad, S. W., Johnsen, B. H., Johnsen, G. E., Laberg, J. C., & Eid, J. (2015). The combined influence of hardiness and cohesion on mental health in a military peacekeeping mission: A prospective study. *Scandinavian Journal of Psychology*, *56*(5), 560-566. https://doi.org/10.1111/sjop.12235

*Torrance, E. P. (2022). *The Torrance Tests of Creative Thinking*. Scholastic Testing Service. https://www.ststesting.com/gift/

*Trent, J. D., Barron, L. G., Rose, M. R., & Carretta, T. R. (2020). Tailored Adaptive Personality Assessment System (TAPAS) as an indicator for counterproductive work behavior: Comparing validity in applicant, honest, and directed faking conditions. *Military Psychology*, *32*(1), 51-59. https://doi.org/10.1080/08995605.2019.1652481

*Tschirner, E., & Bärenfänger, O. (2011). *An Extension of Inquiry into Reliability Issues of the ACTFL Writing Proficiency Test (WPT)* (Report No. 2011-US-PUB-1). Universität Leipzig. https://www.languagetesting.com/pub/media/wysiwyg/PDF/research/ACTFL-WPT-Technical-Report-2011.pdf

*Tschirner, E., & Bärenfänger, O. (2013a). *Assessing Evidence of the Validity of the ACTFL Listening Proficiency Test (LPT)* (Report No. 2013-US-PUB-2). Universität Leipzig. https://www.languagetesting.com/pub/media/wysiwyg/PDF/research/Assessing_Evidence_of_Validity_and_Reliability_of_the_ACTFL_LPT.PDF

*Tschirner, E., & Bärenfänger, O. (2013b). *Assessing Evidence of Validity of the ACTFL Reading Proficiency Test (RPT)* (Report No. 2013-US-PUB-1). Universität Leipzig. https://www.actfl.org/sites/default/files/assessments/acereports/Technical-Report-ACTFL-RPT-for-publication%202013.pdf

*Tseng, F.-C., & Fan, Y.-J. (2011). Exploring the influence of organizational ethical climate on knowledge management. *Journal of Business Ethics*, *101*(2), 325-342. https://doi.org/10.1007/s10551-010-0725-5

*Tucker, J. S., Pleban, R. J., & Gunther, K. M. (2010). The mediating effects of adaptive skill on values-performance relationships. *Human Performance*, *23*(1), 81-99. https://doi.org/10.1080/08959280903400275

U.S. Department of the Army. (2019 October). *The Army People Strategy* (SD 05 Strategy Note 2019-01). Author. https://www.army.mil/e2/downloads/rv7/the_army_people_strategy_2019_10_11_signed_final.pdf

U.S. Department of the Army. (2022, June 16). *Athena*. Center for Army Leadership. https://www.cal.army.mil/ Athena/

*U.S. Department of Defense. (2012). *P&P-ASVAB Forms 23-27 (Technical Bulletin No. 4).* Office of People Analytics. https://www.opa.mil/research-analysis/recruiting-awareness/military-testing/p-p-asvab-forms-23-27-technical-bulletin-no-4/

van der Linden, W. J., & Diao, Q. (2011). Automated test-form generation. *Journal of Educational Measurement*, *48*(2), 206-222. https://doi.org/10.1111/j.1745-3984.2011.00140.x

Vinchur, A. J., Prien, E. P., & Schippmann, J. S. (1993). An alternative procedure for analyzing job analysis results for content-oriented test development. *Journal of Business and Psychology*, *8*(2), 215-226. https://doi.org/10.1007/BF02230386

*Wagner, T. A., & Harvey, R. J. (2006). Development of a new critical thinking test using item response theory. *Psychological Assessment*, *18*(1), 100-105. https://doi.org/10.1037/1040-3590.18.1.100

Wardynski, C., Lyle, D. S., Colarusso, M. J. (2009). *Talent: Implications for a U.S. Army Officer Corps Strategy* (Monograph No. 614). U. S. Army War College. https://press.armywarcollege.edu/monographs/614/

*Wasik, B. H., & Bryant, D. M. (1994). *Three Parent and Adult Problem-Solving Instruments*. *ERIC.* http://files.eric.ed.gov/fulltext/ED379539.pdf

*Watson, G., & Glaser, E. (1980). *Manual for the Watson Glaser Critical Thinking Appraisal*. Pearson. https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/efficacy-and-research/reports/Watson-Glaser_One_Page_Summary.pdf

*Wegmeyer, L. J., Tenbrink, A. P., Delacruz, A. Y., Salim, R., & Speer, A. B. (2022). Interviews from scratch: Individual differences in writing interview questions. *Personnel Assessment & Decisions*, *8*(1), 15-23. https://doi.org/10.25035/pad.2022.01.002

*Welsh, J. R., Kucinkas, S. K., & Curran, L. T. (1990). *Armed Services Vocational Battery (ASVAB): Integrative Review of Validity Studies* (Report No. AFHRL-TR-90-22). Air Force Systems Command.

*White, C. A., Slater, M. J., Turner, M. J., & Barker, J. B. (2021). More positive group memberships are associated with greater resilience in Royal Air Force (RAF) personnel. *British Journal of Social Psychology*, *60*(2), 400-428. https://doi.org/10.1111/bjso.12385

Wiemann, J. M. (1977). Explication and test of a model of communicative competence. *Human Communication Research*, *3*(3), 195–213. https://doi.org/10.1111/j.1468-2958.1977.tb00518.x

*Wihler, A., Blickle, G., Ellen III, B. P., Hochwarter, W. A., & Ferris, G. R. (2017). Personal initiative and job performance evaluations: Role of political skill in opportunity recognition and capitalization. *Journal of Management*, *43*(5), 1388-1420. https://doi.org/10.1177/0149206314552451

*Williams, L. M., Horst, S. J., & Sundre, D. L. (2014). *Test of Oral Communication Skills, Version 2 (TOCS-2)*. Madison Assessment. https://www.madisonassessment.com/assessment-testing/test-of-oral-communication-skills

Williams, R. L., Moore, C. A., Pettibone, T. J., & Thomas, S. P. (1992). Construction and validation of a brief self-report scale of self-management practices. *Journal of Research in Personality*, *26*(3), 216-234. https://doi.org/10.1016/0092-6566(92)90040-B

Wise, L. L., Peterson, N. G., Hoffman, R. G., Campbell, J. P., & Arabian, J. M. (1991). *Army Synthetic Validity Project: Report of Phase 3 Results: Research Instruments* (Research

Product 91-08-VOL-2). U. S. Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. ADA235636).

*Wonderlic. (2022). *WonScore*. https://wonderlic.com/wonscore/

*Wong, J. Y.-H., Fong, D. Y.-T., Choi, A. W.-M., Chan, C. K.-Y., Tiwari, A., Chan, K. L., Lai, V., Logan, T. K., & Bartone, P. T. (2014). Transcultural and psychometric validation of the Dispositional Resilience Scale (DRS-15) in Chinese adult women. *Quality of Life Research*, *23*(9), 2489-2494. https://doi.org/10.1007/s11136-014-0713-9

Wright, T. A., Campbell Quick, J., Hannah, S. T., & Blake Hargrove, M. (2017). Best practice recommendations for scale construction in organizational research. *Journal of Organizational Behavior*, *38*(5), 615-628. https://doi.org/10.1002/job.2180

Yang, J., & Mossholder, K. W. (2010). Examining the effects of trust in leaders: A bases-and-foci approach. *The Leadership Quarterly*, *21*(1), 50-63. https://doi.org/10.1016/j.leaqua.2009.10.004

Yang, Y., & Green, S. B. (2011). Coefficient Alpha: A reliability coefficient for the 21st century? *Journal of Psychoeducational Assessment*, *29*(4), 377-392. https://doi.org/10.1177/0734282911406668

*Young, S. R., & Keith, T. Z. (2020). An examination of the convergent validity of the ICAR16 and WAIS-IV. *Journal of Psychoeducational Assessment*, *38*(8), 1052-1059. https://doi.org/10.1177/0734282920943455

*Young, S. R., Keith, T. Z., & Bond, M. A. (2019). Age and sex invariance of the International Cognitive Ability Resource (ICAR). *Intelligence*, *77*, Article 101399. https://doi.org/10.1016/j.intell.2019.101399

*Zabelina, D. L., Zaonegina, E., Revelle, W., & Condon, D. M. (2022). Creative achievement and individual differences: Associations across and within the domains of creativity. *Psychology of Aesthetics, Creativity, and the Arts*, *16*(4), 618-636. https://doi.org/10.1037/aca0000439

*Zaccaro, S. J., Connelly, S., Repchick, K. M., Daza, A. I., Young, M. C., Kilcullen, R. N., Gilrane, V. L., Robbins, J. M., & Bartholomew, L. N. (2015). The influence of higher order cognitive capacities on leader organizational continuance and retention: The mediating role of developmental experiences. *The Leadership Quarterly*, *26*(3), 342-358. https://doi.org/10.1016/j.leaqua.2015.03.007

*Zaccaro, S. J., Gilrane, V. L., Robbins, J. M., Bartholomew, L. N., Young, M. C., Kilcullen, R. N., Connelly, S., & Young, W. (2012). *Officer Individual Differences: Predicting Long-Term Continuance and Performance in the U.S. Army* (Technical Report 1324). United States Army Research Institute for the Behavioral and Social Sciences. (DTIC Accession No. ADA566745).

*Zaccaro, S. J., Mumford, M. D., Connelly, M. S., Marks, M. A., & Gilbert, J. A. (2000). Assessment of leader problem-solving capabilities. *The Leadership Quarterly*, *11*(1), 37-64. https://doi.org/10.1016/S1048-9843(99)00042-9

*Zhou, Z. E., Yang, L.-Q., & Spector, P. E. (2015). Political skill: A proactive inhibitor of workplace aggression exposure and an active buffer of the aggression-strain relationship. *Journal of Occupational Health Psychology*, *20*(4), 405-419. https://doi.org/10.1037/a0039004

*Zuo, B., Wen, F., Wang, M., & Wang, Y. (2019). The mediating role of cognitive flexibility in the influence of counter-stereotypes on creativity. *Frontiers in Psychology*, *10*, Article 105. https://doi.org/10.3389/fpsyg.2019.00105

Acronyms

ACTT	Army Critical Thinking Test
AEAS	Army Enterprise Assessment System
AMC	Army Measures Compendium
AOC	Area of Concentration
AOM	Academy of Management
ARI	United States Army Research Institute for the Behavioral and Social Sciences
ASVAB	Armed Services Vocational Aptitude Battery
ATAF	Army Talent Attribute Framework
ATMTF	Army Talent Management Task Force
AVID	Adaptive Vocational Interest Diagnostic
BFI	Big Five Inventory
CAL	Center for Army Leadership
CCAI	Communication Competency Assessment Instrument
CCSR	Communication Competency Self Report
COMSA	Communication Skills Assessment
DCM	Diagnostic Classification Model
DID	Database of Individual Differences
DTIC	Defense Technical Information Center
EEOC	Equal Employment Opportunity Commission
ETS	Educational Testing Service
FA	Functional Area
ICAR	International Cognitive Ability Resource
ICTL	Individual Critical Task List
IIP	Interest Item Pool
IPIP	International Personality Item Pool
IRT	Item Response Theory
KSAO	Knowledge, Skills, Abilities, and Other Characteristics
LOE	Lines of Effort
LTI	Language Testing International
ML	Machine Learning
MOS	Military Occupational Specialty
NCO	Non-commissioned Officer
NLP	Natural Language Processing
OAR	Overall Assessment Rating
SME	Subject Matter Expert
SIOP	Society for Industrial and Organizational Psychology
SJT	Situational Judgment Test
TAPAS	Tailored Adaptive Personality Assessment System
WO	Warrant Officer

Appendix A
An Army Measures Compendium (AMC)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
1	**Communication Ability** - Uses verbal and nonverbal means to maintain listener interest. Adjusts information sharing strategy based on operating conditions. Ensures prompt information dissemination to all levels. Avoids miscommunication through verifying a shared understanding.	Communication Skills Assessment (COMSA-R2) (Arch Profile)	C	• Dimensions: verbal expression, listening skills, emotional management, assertiveness, and insightfulness. • Number of Items: 38 • Time: 10 minutes	AT	• *Internal Consistency*: (.91) (Manual and Documentation)	• *Proprietary*
		Communication Competency Assessment Instrument (CCAI) / Communication Competency Self-Report (CCSR) (Rubin, 1985)	A	Two measures: *CCAI*: an assessment instrument evaluating target performance in exercises, *CCSR* a self-report survey of communication competence. • Dimensions: Appropriateness & Effectiveness of communication • Response Format: Likert-type rating scale • Number of items: 30 across both measures	PE / SR	• *Internal Consistency*: CCAI: (.86) (Rubin, 1985; Rubin & Graham, 1988) CCSR: (.87) (Rubin, 1985; Rubin & Graham, 1988) (.75) (Kirchmeyer, 1993) • *Interrater Reliability*: CCAI: (.92, .97) (Rubin, 1985)	• *Influencing Decisions:* (.22) (Kirchmeyer, 1993)
2	**Communicator** - Precise, efficient, and compelling in both written and spoken word. (*Effective Communication Behaviors)*	Communication Behavior Checklist (Mitchell et al., 2022)	A	• Dimensions: Speaking clearly, speaking confidently, speaking concisely, using appropriate grammar, speaking with expressiveness, demonstrating appropriate nonverbal communication. • Response format: Other-report by trained raters • Response anchors: each behavior assessed on a scale from 0 (the behavior was not performed at all) to 2 (the behavior was performed to a great extent)	BOS		• *Leadership Emergence*: (.26, .35) (Mitchell et al., 2022)
3	**Dependability** - Trustworthy, reliable, planful, and accountable. Respects the	Olaru Dependability Assessments (Olaru et al., 2019)	A	Three measures: *Dependability Situational Judgment Test (DSJT), Dependability Self-Report (DSR),*	BD / SJT / SR	• *Internal Consistency:* DBD: (.85) DSJT: (.78, .83)	• *Goal Attainment:* DBD: (.14, .17) DSJT: (.14, .21)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	value of discipline. Does not shy away from responsibility. Makes effort to keep promises.			*Dependability Biodata (DBD)* • Number of Items: DSJT: 18 DSR: 30 DBD: 18 • Response Anchors: DSJT: 5-point Likert-type Scale (1 = Very Unlikely to 5 = Very Likely) • DSR: 6-point Likert-type Scale (1=Strongly Disagree to 6 = Strongly Agree). Half of the items are reverse-coded. • DBD: 6-point Likert-type Scale (1=Never to 6 = Always)		DSR: (.91, .92) (Olaru et al., 2019)	DSR: (.14) (Olaru et al., 2019) • *Job Satisfaction:* DBD: (.18) DSJT: (.03) DSR: (.24) (Olaru et al., 2019) • *Attrition Intentions:* DBD: (-.15) DSJT: (-.05) DSR: (-.22) (Olaru et al., 2019) • *CWB-I & CWB-O:* DBD: (-.65, -.51) DSJT: (-.34, -.31) DSR: (-.53, -.36) (Olaru et al., 2019)
		Hogan Personality Inventory (HPI) – Prudence Dimension – IPIP version available (Goldberg, 2022; Hogan & Hogan, 2007)	C / P	• Items: 10 • Response Anchors: True-False • Dimensions: Dependable, Conscientious, Conforming	SR	• *Internal Consistency* (.78) (Hogan & Hogan, 2007) (.78) (Kisamore et al., 2007) (.69) (Kaiser & Hogan, 2011) (.71) (Furnham & Treglown, 2022)	• *Job Performance* (.36) (Hogan & Hogan, 2007) (.25, .29) (Hayes et al., 1994) • *Contextual Performance* (.17, .20) (Hogan et al., 1998) • *Altruism* (.14, .16) (Furnham et al., 2016) • *Military Training Performance (Naval Academy Class Ranking)* (.08) (Lall et al., 1999) • *Training Program Attendance* (.00) (Ryan et al., 1998) • *Educational Achievement (GPA)* (.13, .24) (Martin et al., 2006) • *Unethical Behavioral Intentions*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
							(-.19) (Kisamore et al., 2007) • *Whistleblowing (Reporting Cheating)* (.23) (Kisamore et al., 2007) • *Leadership Behavior* (-.19, .33) (Kaiser & Hogan, 2011)
		Tailored Adaptive Personality Assessment System (TAPAS) / Non-commissioned Officer Special Assignment Battery (NSAB) – Responsibility subscale (Drasgow et al., 2012)	A / G	• Administration Format: Computer (CAT or fixed length) • Response format: Selecting the statements (matched in social desirability and extremity) that is "more like me" • Number of Items: 120 (total test, fixed-length version), 54 (responsibility subscale bank), 42 (responsibility subscale bank – second pool) • Time commitment: Median 20 minutes (total test, fixed-length version)	FC		• *Job Performance* (.12, CMA) (Drasgow et al., 2012) (.09, PR, CMA; .03, SR, CMA) (Kantrowitz et al., 2019) (.12, recruiter sample) (Nye et al., 2020) • *Training Performance* (.06, CMA) (Drasgow et al., 2012) (.00, CMA) (Kantrowitz et al., 2019) • *Fitness Performance* (.00, CMA) (Kantrowitz et al., 2019) • *Contextual Performance* (.17, CMA) (Drasgow et al., 2012) • *CWB* (-.02, CMA) (Drasgow et al., 2012) (-.03, CMA) (Kantrowitz et al., 2019) • *Leadership Effectiveness* (.30) (Drasgow et al., 2012) • *Army Commitment* (.04, recruiter sample) (Nye et al., 2020) • *Strain* (-.01, recruiter sample) (Nye et al., 2020) • *Promotion* (.12, CMA) (Kantrowitz et al., 2019) (.10, selection for training

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
							opportunity) (Nye et al., 2014) • *Attrition* (-.08, CMA) (Drasgow et al., 2012) (-.03, -.10, CMA, across several time lags) (Kantrowitz et al., 2019)
4	**Sound Judgement** - Capacity to assess situations shrewdly and draw sound conclusions. Tendency to form sound opinions, make sensible decisions and reliable guesses. Ability to assess strengths and weaknesses of subordinates, peers, and enemy to create appropriate solutions and action.	Judgment Assessment Report (Hogan, 2014)	C			• *Proprietary*	• *Proprietary*
		Situated Wise Reasoning Scale (SWIS) (Brienza et al., 2018)	A	• Prerequisite Procedure: Assesses first reconstruct a specific, recent difficult work social conflict, reflect on what they thought and felt during that situation. • Dimensions: Intellectual Humility, Consideration of Change, Consideration of Multiple Ways a Situation may Unfold, Recognition of Others' Perspectives, Consideration of Compromise, Recognition of Importance of Conflict Resolution, Application of outsider viewpoint • Number of Items: 21 • Response Anchors: 5-point Likert-type Rating Scale (1 = not at all, 3 = somewhat, 5 = very much)	SR	• *Internal Consistency* (.75, .93) (Brienza et al., 2018)	• *Impression Management* (.07) (Brienza et al., 2018) • *Biased Evaluations* (-.11) (Brienza et al., 2018) • *Conflict Resolution* (.07, .24) (Brienza et al., 2018) • *Conflict Perpetuation* (-.13, .01) (Brienza et al., 2018) • *Situational Sensitivity* (.13, .25) (Brienza et al., 2018)
5	**Oral Communication Skill** - Speaks in a clear, organized, and logical manner. Communicates information or asks questions in an efficient and understandable way. Adapts communication styles	Test of Oral Communication Skills (TOCS2, Madison Assessment) (Williams et al., 2014)	C	• Additional elements: 11-item attitudes toward communication self-report survey • Number of Items: 100 • Dimensions: Knowledge of the fundamental processes	SA	• *Internal Consistency* (.75) (Manual and Documentation)	• *Final Speech Evaluation in a Course* (.23) (Manual and Documentation)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	to different situations. Uses nonverbal gestures to supplement and reinforce spoken messages.			influencing communication; construction of messages consistent with the diversity of the communication purpose, audience, and context; responding to messages consistent with the diversity of the communication purpose, audience, context, and ethics; utilizing information literacy skills expected of ethical communicators • Administration format: Proctored, computer-based • Response format: Multiple Choice • Score range: 0 to 100 • Norming information: Designed for the undergraduate, higher education level			
		Test of English for International Communication (TOEIC) - Speaking Test (ETS, 2022)	C	• Purpose: Although developed for international communication, it has been widely used outside of this context for other purposes • Number of Items: 11 • Response Formats: Reading a text aloud, describing a picture, responding to questions (using information provided), proposing a solution, expressing an opinion • Dimensions: Pronunciation, Intonation, Stress, Grammar, Vocabulary, Cohesion, Relevance of Content, Completeness of Content • Time commitment: approximately 20 minutes • Score Range: 0 to 200 • Response Anchors: Ranges from 0 to 3/5, depending upon item	SA	• *Internal Consistency* (.87, .91) (Qu et al., 2017) (.82, .86) (Liao & Wei, 2010) • *Test-Retest* (.80) (Liao & Qu, 2010) • *Interrater Reliability* (.80≤) (Liao & Wei, 2010) • *Interrater Agreement* (98%, 100%) (Qu & Ricker-Pedley, 2013)	• *Workplace Communication Performance Ratings* (.84) (Schmidgall & Powers, 2021)
		American Council on the Teaching of	C	• Administration Format: Proctored, Phone or Computer	SI	• *Interrater Reliability* (.74, .93, SP)	• *Not collected by Test Developer*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
		Foreign Languages Oral Proficiency Interview (ACTFL OPI) – Language Testing International (LTI, 2022c)		• Dimensions: Functions or global tasks of speaking, oral performance in social contexts and specific content areas, accuracy, capability of oral text and discourse • Time commitment: Phone (15-30 minutes), Computer (20-40 minutes) • Four Phases: Warm-up, Level Checks, Probes, Wind-down • Rater Information: Single rater, 50% of all recorded assessments are double-coded for quality assurance. Rating can be certified/official by request, with the recorded assessment coded by two certified raters who must agree and come to consensus • Rating Scale: Novice (1), Intermediate (2), Advanced (3), Superior (4). Further differentiated into sublevels (Low, Mid, High) • Languages: Available in over 100 languages		(Dhonau, 2020) (.84, .96, SP) (Massei, 2020) (.95, SP) (Abadin et al., 2012) (.97, SP) (Abadin et al., 2010) (.79, .94, Intraclass Correlation [ICC]) (Surface et al., 2008) (.85, SP) (Surface et al., 2008) (.98, SP) (Surface & Dierdorff, 2003) • *Interrater Agreement* (92%, 100%, adjacent) (Dhonau, 2020) (97%, 100%, adjacent) (Massei, 2020) (79%, 83%, absolute) (Abadin et al., 2012) (71%, 80%, absolute) (Abadin et al., 2010) (41%, 59%, absolute) (Surface et al., 2008) (81%, absolute) (Surface & Dierdorff, 2003) • *Test-Retest Reliability* (.90, .93) (SWA, 2009) (.89, .94) (Surface et al., 2008)	
6	**Written Communication** - Communicates written information and ideas to others in a clear, accurate, concise, grammatically correct, and well-organized manner.	Test of English for International Communication (TOEIC) - Writing Test (ETS, 2022)	C	• Purpose: Although developed for international communication, it has been widely used outside of this context for other purposes • Number of Items: 8 • Response Formats: Writing a sentence based on a picture, responding to a written request, writing an opinion essay • Dimensions: Grammar, relevance of content, quality and variety of content,	AT	• *Internal Consistency (for Dimensional Ratings)* (0.52, 0.66) (Liao & Wei, 2010) • *Test-Retest* (.82) (Liao & Qu, 2010) • *Interrater Agreement* (97%, 100%) (Qu & Ricker-Pedley, 2013)	• *Workplace Writing Effectiveness Ratings* (.76) (Schmidgall & Powers, 2020)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
				vocabulary, organization, supporting opinions • Time commitment: approximately 60 minutes • Score Range: 0 to 200 • Response Anchors: Ranges from 0 to 3/4/5, depending upon item			
		American Council on the Teaching of Foreign Languages Written Proficiency Test (ACTFL WPT) – Language Testing International (LTI, 2022d)	C	• Administration Format: Proctored, Paper-and-Pencil or Computer • Dimensions: Functions or global tasks of speaking, written performance in social contexts and specific content areas, accuracy, capability of written text and discourse • Time commitment: 20-80 minutes • Four Phases: Introduction and Warm-up, Writing Prompt • Rater Information: Single rater, 50% of all recorded assessments are double-coded for quality assurance. Rating can be certified/official by request, with the recorded assessment coded by two certified raters who must agree and come to consensus • Rating Scale: Novice (1), Intermediate (2), Advanced (3), Superior (4). Further differentiated into sublevels (Low, Mid, High) • Languages: Available in over 30 languages	AT	• *Interrater Reliability* (.94, SP) (Cubbellotti, 2015) (.92, SP) (Tschirner & Bärenfänger, 2011) • *Interrater Agreement* (77%, absolute) (Cubbellotti, 2015) (80%, absolute) (Tschirner & Bärenfänger, 2011)	• *Not collected by Test Developer*
7	**Reading Comprehension** - Understands written sentences and paragraphs in instructions, operator's manuals, basic textbooks, letters of instructions, written orders, and job directives.	Armed Services Vocational Aptitude Battery (ASVAB) – Armed Forces Qualification Test (AFQT) – Paragraph Comprehension subscale (Defense Manpower Data Center, 2012)	G	• Administration Format: Paper-or-pencil or computerized adaptive test (CAT) • Time Limit: 27 minutes (CAT without tryout questions), 75 minutes (CAT with tryout questions), 13 minutes (paper-and-pencil) • Response Format: Multiple	AT	• *IRT Marginal Reliability* (.75, .85) (Defense Manpower Data Center, 2012)	• *Job Performance* (.61) (Welsh et al., 1990)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
				Choice (4 response options) • Number of Items: 15 (paper-and-pencil), 10 (CAT)			
		American Council on the Teaching of Foreign Languages Reading Proficiency Test (ACTFL RPT) – Language Testing International (LTI, 2022b)	C	• Administration Format: Computer, CAT • Dimensions: functions and purposes of the written language the reader comprehends, content areas and context for which texts have been written, text type the reader can understand, range of vocabulary and grammatical structures, cultural references the reader can understand • Time commitment: 50-125 minutes • Response Format: Multiple Choice (4 response options) • Languages: Available in 12 languages • Classification Scale: Novice (1), Intermediate (2), Advanced (3), Superior (4). Further differentiated into sublevels (Low, Mid, High) • Number of Items: 10-25 texts, 3 items per text (30-75 items)	AT	• *Internal Consistency* (.84, .94) (Tschirner & Bärenfänger, 2013b)	• *Not collected by Test Developer*
		Reading Comprehension Test (Hire Success, 2022)	C	• Administration Format: Computer • Dimensions: Ability to understand, remember, analyze, and apply material that is read. Involves recalling information about characters, locations, and the sequence of events • Number of Items: 10 (targeted toward one short story) • Time commitment: Untimed	AT	• *Proprietary*	• *Proprietary*
8	**Active Listening** - Carefully attends to and understands both the overt and implied meaning of oral communications from others	Active-Empathetic Listening Scale (AELS) - General (Bodie, 2011; Drollinger et al., 2006)	A	• Number of Items: 11 • Dimensions: Sensing, Processing, Responding • Response Anchors: 7-point scale (1 = never or almost	BOS / SR	• *Internal Consistency* (.86, .94) (Bodie, 2011) (.88) (Decuypere & Pircher	• *Conversational Effectiveness* (.64, .75) (Bodie, 2011) • *Leader Communication*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
	by accurately perceiving the content, context, and tone of the speaker; not interrupting at inappropriate times.			never true to 7 = always or almost always true)		Verdorfer, 2022) (.95) (Lloyd et al., 2017) (.80, .93) (Bodie et al., 2014) (.91) (Jones et al., 2019) (.96) (Jonsdottir & Kristinsson, 2020) (Original - Sales Version) (.74, .77) (Drollinger et al., 2006)	*Effectiveness* (i.e., followers feel understood) (.79) (Lloyd et al., 2017) • *Satisfaction with Supervisor* (.79) (Lloyd et al., 2017) • *Job Satisfaction* (.56) (Lloyd et al., 2017) • *Emotional Support Effectiveness* (.08) (Jones et al., 2019) • *Selling Performance Behaviors* (e.g., meeting objectives, presentation quality) (.28, .48) (Drollinger et al., 2006)
		Components of Listening Scale (Ramsey & Sohi, 1997)	A	• Number of Items: 13 • Dimensions: Sensing, Evaluating, Responding • Response Anchors: Likert Scale (1 = strongly disagree to 5 = strongly agree)	BOS	• *Internal Consistency* (.64, .91) (Ramsey & Sohi, 1997) (.80) (Teng, Zhang, & Lou, 2020) (.94) (Qian et al., 2019) (.72, .87) (Castro et al., 2018)	• *Communication Effectiveness* (-.06) (Teng, Zhang, & Lou, 2020) • *Subordinate Feedback Seeking from active listening leader* (.17) (Qian et al., 2019) • *Subordinate Transformational Leadership Perceptions* (.76) (Castro et al., 2018) • *Subordinate Creativity* (.04, .56) (Castro et al., 2018)
		Listening Skills Inventory - Revised (LSI-R) (Creative Organizational Design, 2022)	C	• Time commitment: 15 to 30 minutes • Administration Format: Computer • Dimensions: External distractions, conversation flow, speaker-to-listener	SA	• *Internal Consistency* (.91) (Creative Organizational Design, 2022)	• *Proprietary*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
				transition, body language, internal distractions, attention span, hearing a person out • Number of items: 54			
9	**Attentiveness** - Focuses on the problem or situation and shifts attention between activities when appropriate.	Listening Skills Inventory - Revised (LSI-R) - Attention Subscales (Creative Organizational Design, 2022)	C	• Time commitment: 15 to 30 minutes • Administration Format: Computer • Dimensions: Attention Span • Number of items: 54 (total assessment	SA	• *Internal Consistency* (.91, total assessment) (Creative Organizational Design, 2022)	• *Proprietary*
		Criteria Attention Skills Test (CAST) (Criteria, 2022a)	C	• Dimensions: Divided attention, selective attention: vigilance, selective attention: filtering, and perceptual reaction time • Time commitment: 9-12 minutes	AT	• *Proprietary*	• *Job Performance* (.50) (Criteria, 2022a)
		The Perception and Attention Function Battery (WAF) (Schuhfried, 2022)	C	• Administration Format: Computer • Test Length: Long and Short Forms available • Dimensions: Alertness, Vigilance, Focused Attention, Divided Attention, Spatial Attention, Selective Attention, Smooth Pursuit Eye Movement, Visual Scanning • Number of Items: Over 42 subtests are available for use • Languages: Available in 17 languages • Time Commitment: 2 to 32 minutes, depending upon the subtest selected	AT	• *Internal Consistency* (.92, .97) (Schuhfried, 2022)	• *Proprietary*
10	**Mental Agility** - Flexibility of mind; the ability to break habitual thought patterns. Anticipating or adapting to uncertain or changing situations; to think through outcomes when current decisions or actions are not producing desired effects. Ability to apply multiple perspectives and approaches.	Multifactor Measure of Performance (MMP3) –Ingenuity Subscale - (Into Performance, 2022)	A / C	• Administration Format: Computer • Time Commitment: 20 minutes • Number of Items: 120 (total MMP, 18 dimensions) • Reading Level: 8-10 • Response Anchors: 9-point rating scale	SR	• *Internal Consistency* (.68, .78) (Into Performance, 2022) (.76) (Bar-On & Fiedeldey-Van Dijk, 2022) (.78) (Bar-On, 2018)	• *Productivity* (.62) (Into Performance, 2022) • *Leadership* (.72) (Into Performance, 2022)
11	**Self-Management** -	Self-Management	A	• Number of items: 11	SR	• *Internal Consistency*	• *Employee Well-being*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
	Effectively manages the full range of one's work and nonwork responsibilities (e.g., setting and prioritizing goals, allocating effort and personal resources, and assessing own performance).	Measure (Renn et al., 2011)		• Dimensions: Personal Goal-Setting, Monitoring, Operating on self (e.g., execution) • Response anchors: 5-point Likert-type scale (1 = Describes me very well 5 = Does not describe me at all)		(.70, .72) (Renn et al., 2011) (.72) (Li et al., 2021)	(.44) (Li et al., 2021)
		Self-Management Strategies scale (Murphy & Ensher, 2001)	A	• Number of items: 7 • Dimensions: Use of positive cognitions, Self-set goals, Behavioral self-observation • Response anchors: Likert scale	SR	• *Internal Consistency* (.68, .80) (Murphy & Ensher, 2001)	• *Subjective Career Success* (.09, .24) (Murphy & Ensher, 2001)
		Individual Self-Management / Leadership Measure (Manz & Sims, 1987; Millikin et al., 2010)	A	• Number of Items: 36 • Dimensions: Self-observation-self-goal setting, rehearsal, reminders, self-reliant problem-solving, self-job enrichment, creating self-motivating situations, self-expectation, self-talk, opportunity thinking • Response Anchors: Likert Scale	SR	• *Internal Consistency* (.76 average across dimensions) (Millikin et al., 2010) • *Interrater Reliability* (.65) (Cohen et al., 1997)	• *Team Effectiveness / Productivity* (.26) (Millikin et al., 2010) (.05, .41) (Cohen et al., 1997) • *Team Productivity Gain* (.07, .35) (Millikin et al., 2010) • *Team Organizational Commitment* (.00, .45) (Cohen et al., 1997) • *Team Job Satisfaction* (.10, .34) (Cohen et al., 1997) • *Team Cohesion* (.15, .48) (Millikin et al., 2010)
12	**Cooperation / Teamwork** - Works collaboratively with others to solve problems and achieve group goals and objectives.	Self-Assessed Collaboration Skills (SACS) Measure (Hinyard et al., 2019)	A	• Number of Items: 11 • Dimensions: Information sharing, team support, team learning • Response Anchors: 7-point Likert-type scale (1 = Strongly Disagree 7 = Strongly Agree)	SR	• *Internal Consistency* (.87) (Hinyard et al., 2019)	• *Contextual Performance* (.26) (Hinyard et al., 2019)
		Team Effectiveness Survey – Productivity subscales (AIIR, 2022)	C	• Number of Items: 36 • Dimensions: *Team Productivity:* Alignment, Execution, Learning & Adapting, *Team Culture:* Trust & Safety, Cohesion, Dialogue	360	• *Internal Consistency* (.49, .87, KR) (AIIR, 2022)	• *Proprietary*
13	**Critical Thinking** - Uses logic and reasoning to identify the strengths and	Watson-Glaser Critical Thinking Appraisal (WGCTA)	A / C	• Dimensions: Ability to recognize assumptions, ability to evaluate arguments, ability	AT	• *Internal Consistency* (.83) (Pearson, 2022)	• *Job Performance* (.16, .58) (Pearson, 2022)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	weaknesses of alternative solutions, conclusions or approaches to problems.	(Pearson, 2022; Watson & Glaser, 1980) / Wagner Assessment Test (WAT) – IRT-based WGCTA analogue (Wagner & Harvey, 2006)		to draw logical conclusions • Administration Format: Paper-and-pencil or computer • Time Limit: 30 minutes (untimed version available) • Languages: Available in 7 languages • Number of items (WAT): 40-80		(.93) (Wagner & Harvey, 2006) • *Test-Retest* (.73, .89) (Pearson, 2022) • *Parallel Forms* (.82, .88) (Pearson, 2022)	(.19) (Hoffman et al., 2011) • *Verbal Interview Performance* (.43) (Lafontaine & Cyr, 2016) • *Leadership Emergence* (.06, .27) (Hoffman et al., 2011) • *Production Performance* (.21) (Hoffman et al., 2011) • *Educational Achievement* (.38, .62) (Pearson, 2022)
		Halpern Critical Thinking Assessment (HCTA) (Schuhfried, 2010)	A / C	• Number of Items: 25 • Dimensions (Total score weights in parentheses): Verbal reasoning (12%, Argument Analysis (21%), Thinking as Hypothesis Testing (24%), Likelihood and Uncertainty (12%), Decision Making and Problem Solving (31%) • Time Commitment; 60-80 minutes • Administration Format: Computer • Score Range: 0-194	CR / FC / SR	• *Internal Consistency* (.79, .88) (Schuhfried, 2010) (.33, .75) (de Bie et al., 2015) (.82) (Dwyer et al., 2012) (.88) (Butler et al., 2012) (.75, OM) (Rodrigues Franco et al., 2018) • *Interrater Reliability* (.82) (Schuhfried, 2010) (.93) (Butler et al., 2012)	
		Cornell Critical Thinking Test (CCTT) – Level Z (Adults) (The Critical Thinking Company, 2022)	C	• Number of Items: 52 • Response format: multiple choice • Time commitment: Either untimed, or 50 minutes • Dimensions: Induction, Deduction, Credibility, Identification of assumptions, semantics, definition, prediction	AT	• *Internal Consistency* (.69, average SH) (The Critical Thinking Company, 2022) (.74, .80) (Frisby, 1992)	• *Ethical Decision-making* (.23) (Keskin Samancı, 2015)
14	**Adaptability** - Modifies behavior or plans as necessary to reach goals. Is able to maintain effectiveness in varying environments with	Individual Adaptability (I-ADAPT) Scale (Ployhart & Bliese, 2006)	A / G	• Number of Items: 55 • Response Anchors: Likert Scale • Time commitment: Approximately 10 minutes	SR	• *Internal Consistency* (.73) (Hua et al., 2019) (.86, .91) (Cullen et al., 2014)	• *Job Performance* (.25) (Ployhart & Bliese, 2006) • *Stress Reduction* (.30, SW)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	various tasks, responsibilities, or people.			• Dimensions: Crisis, Work Stress, Creativity, Uncertainty, Learning, Interpersonal, Cultural, Physical		(.69, .79) (Cotter & Fouad, 2013)	(Hua et al., 2019) • *Host Culture Identification* (.38, SW) (Hua et al., 2019) • *Burnout Reduction* (.18, .61) (Cotter & Fouad, 2013)
		Adaptive Skill (Tucker et al., 2010)	A / G	• Number of Items: 7 • Dimensions: Handling emergency crises situations, handling work stress, solving problems creatively, dealing effectively with unpredictable or changing work situations, demonstrating interpersonal adaptability, demonstrating ability to develop an adaptable unit, demonstrating physical adaptability • Response anchors: 4-point scale	OR	• *Internal Consistency* (.89) (Tucker et al., 2010)	• *Technical-Administrative Performance* (.79) (Tucker et al., 2010) • *Contextual Performance* (.77) (Tucker et al., 2010) • *Leadership Behavior* (.72) (Tucker et al., 2010)
		Adaptability (Bartone et al., 2013)	A / G	• Number of Items: 10 • Response Anchors: Likert-type scale (1=Not at all confident 5 = Very Confident) • Dimensions: Handles emergencies or crisis situations, handles work stress, solves problems creatively, deals with uncertain and unpredictable work situations, learns new work tasks technologies and procedures, demonstrates interpersonal adaptability, demonstrates cultural adaptability, demonstrates physical oriented adaptability	SR / OR	• *Internal consistency* (.90) (Bartone et al., 2013)	• *Military Program Score (MPS)* (.05, .20) (Bartone et al., 2013)
15	**Coordination** - Adjusting actions in relation to others' actions.	Team Effectiveness Survey – Alignment subscale (AIIR, 2022)	C	• Number of Items: 36 • Dimensions: *Team Productivity:* Alignment, Execution, Learning & Adapting, *Team Culture:* Trust & Safety, Cohesion, Dialogue	360	• *Internal Consistency* (.49, .87, KR) (AIIR, 2022)	• *Proprietary*
16	**General Cognitive Aptitude** - Capacity to understand and interpret information that is	WonScore – Wonderlic Cognitive Ability Test (Wonderlic, 2022)	C	• Number of Items: 50 • Time limit: 12 minutes • Dimensions: math, basic logic,	AT	• *Internal* Consistency (.88, .94) (Wonderlic, 2022)	• *Job Performance* (.21) (Howe, 2019)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	being presented, ability to identify and solve problems, and capability to learn new things quickly and efficiently.			language comprehension, spatial reasoning, pattern identification • Administration Mode: Computer (CAT)		(.81, SH) (Bosco, Allen, & Singh, 2015) (.82) (Jansen et al., 2013) (.86) (Mount et al., 2008) • *Parallel Forms* (.73, .95) (Wonderlic, 2022) • *Test-Retest* (.82, .94) (Wonderlic, 2022)	(-.11, .19, SR) (Bosco, Allen, & Singh, 2015) (.18) (Jansen et al., 2013) (.21) (Mount et al., 2008) • *Training Performance* (.19, .57) (Bosco, Allen, & Singh, 2015) • *Overall Assessment Center Rating (OAR)* (.27) (Jansen et al., 2013) • *CWB* (-.04, CMA) (Gonzalez-Mulé et al., 2014) • *OCB* (.22, CMA) (Gonzalez-Mulé et al., 2014)
		International Cognitive Ability Resource (ICAR) (The International Cognitive Ability Resource Team, 2014)	P	• Items: Database of hundreds of cognitive ability items for developing and researching cognitive aptitude / intact cognitive aptitude test was assembled from the resource • Number of Items: 60 item and 16 item version • Dimensions/Item formats: 3-D rotation, letter and number series, matrix reasoning, verbal reasoning, progressive matrices, face detection, figural analogies, melodic discrimination, number series, perceptual maze, abstract reasoning, numerical reasoning, situational judgment	AT	• *Internal Consistency* (.68, .93) (.71, .94, OM) (Condon & Revelle, 2014) (.88) (Karwowski et al., 2016) (.81) (Young et al., 2019) (.77) (Blacksmith et al., 2019) (.81) (.83, OM) (Young & Keith, 2020) (.94) (.95, OM) (Zabelina et al., 2022) (.93) (Merz et al., 2022)	• *Creative Performance* (.12) (Zabelina et al., 2022)
		Armed Forces Qualification Test (AFQT) – Armed Services Vocational Aptitude Battery (ASVAB) (Defense Manpower	G	• Administration Format: Paper-or-pencil or computerized adaptive test (CAT) • Time Limit: 27 minutes (CAT without tryout questions), 75 minutes (CAT with tryout questions),	AT	• *IRT Marginal Reliability* (.75, .97) (Defense Manpower Data Center, 2012)	• *Job Performance* (.61) (.35, AFQT) (Welsh et al., 1990)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
		Data Center, 2012)		13 minutes (paper-and-pencil) • Response Format: Multiple Choice (4 response options) • Number of Items: 15 (paper-and-pencil), 10 (CAT)			
17	**Problem Solver** - Capacity to choose between best practices and unorthodox approaches to reach a solution. Accomplishes the task.	(Un)cued Problem Solving Measure (Zaccaro et al., 2000)	A / G	• Versions: Cued and Uncued versions • Time limit: 8 minutes (cued); 10 minutes (uncued) • Response anchors: Likert-type scale (1 = low 5 = high) • Number of items: 10 (cued), 2 (uncued)	OR	• *Interrater Reliability* (.82) (Zaccaro et al., 2000) (.93) (Zaccaro et al., 2012)	• *Officer Achievement* (.41, .46) (Zaccaro et al., 2000) (.36, .43) (Connelly et al., 2000) • *Divergent Thinking* (.42, .54) (Zaccaro et al., 2015) • *Retention* (.32, .49) (Zaccaro et al., 2015) (.41) (Zaccaro et al., 2012) • *Task Performance* (.19, .21) (Mumford et al., 2000) • *Occupational Attainment* (i.e., Rank) (.40) (Zaccaro et al., 2012)
		Problem Solving Rating Scale for Employees (PSRS-E) (Lohman, 2004; Wasik & Bryant, 1994)	A	• Response Format: Likert Scale • Number of Items: 28	SR / OR	• *Internal Consistency* (.93, .97) (Lohman, 2004) • *Test-Retest* (.47, .91) (Lohman, 2004)	
		General Aptitude Mobile Evaluation (GAME) (Criteria, 2022b)	C	• Administration Format: Mobile Game • Dimensions: Critical thinking, problem solving ability, attention to detail, ability to learn new information • Time commitment: 5-6 minutes • Number of "items": 3 minigames	G	• *Proprietary*	• *Educational Achievement* (GPA) (.19) (Landers et al., 2022)
18	**Analytical Thinking** - Analyzes information and applies general rules and logic to address work-related issues and problems.	Hogan Business Reasoning Inventory (HBRI) (Hogan et al., 2007)	C	• Administration format: Self-administered, computer • Dimensions: strategic, tactical • Number of items: 24 • Time Limit: Untimed or 30-minute-timed version	AT	• *Internal Consistency* (.82) (Hogan et al., 2007) • *Test-Retest* (.87, .92) (Hogan et al., 2007)	• *Job Performance* (.17) (Hogan et al., 2007) • *Educational Achievement* (.38) (Hogan et al., 2007)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
19	**Time Management** - Manages one's own time and the time of others.	Time Management (US) (SHL, 2022)	C	• Time Limit: 90 minutes • Administration Method: Computer (CAT), unproctored • Dimensions: Action plans, Controlling, Decision-making, Organizing, Planning, Scheduling, Time Usage, Time Wasters	SJT	• *Proprietary*	• *Proprietary*
		Time Management Skill (Macan, 1994)	A	• Response anchors: 7-point rating scale (1 = Seldom true 7 = Very Often true) • Number of items: 7	SR	• *Internal Consistency* (.91) (Rapp et al., 2013)	• *Job Performance* (-.01, -.07) (Macan, 1994) (.09, .21) (Rapp et al., 2013) • *Job Satisfaction* (.10, .19) (Macan, 1994)
		Time Management Planning (Parke et al., 2018)	A	• Response Anchors: 7-point rating scale (1 = not at all 7 = To a very great extent) • Number of Items: 6	SR	• *Internal Consistency* (.93, average over 10-day period) (Parke et al., 2018)	• *Job Performance* (.24) (Parke et al., 2018)
20	**Detail-Focused and Precise** - Attentive to detail and thorough, accurate, and precise in completing a task.	Attention to Detail (Miron et al., 2004)	A	• Response Anchors: 7-point Likert-type scale • Number of Items: 4	SR	• *Internal Consistency* (.79, .83) (Miron et al., 2004) (.84) (Miron-Spektor et al., 2011)	• *Job Performance* (.15, .25) (Miron et al., 2004) • *Team Creativity* (-.26) (Miron-Spektor et al., 2011) • *Team Standards Adherence* (.48) (Miron-Spektor et al., 2011)
		The Attention to Detail Test (Stevenor et al., 2022)	A	• Number of items: 26 • Response format: multiple choice • Time limit: Untimed	AT	• *Internal Consistency* (.72, OM) (Stevenor et al., 2022)	• *Job Performance* (.12, .24) (Stevenor et al., 2022)
		Abridged Big Five Dimensional Circumplex – Organization Subscale (AB5C) (Goldberg, 2022)	P	• Availability: Available for use from the IPIP database • Response anchors: Likert-type scale • Number of items: 12	SR	• *Internal Consistency* (.78) (Bucher & Samuel, 2019) (.87) (Bäckström et al., 2009)	
21	**Analyzes and Organizes Information to Create Knowledge** - Reflects on prior learning; organizes insights for future application. Considers source, quality or	Virtual Assessment Center (VirtualAC) (Talogy, 2022b)	C	• Administration Format: Computer (online desktop environment simulation) • Rating information: Administration and marking of Virtual AC performance aided	PE	• *Proprietary*	• *Proprietary*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	relevance, and criticality of information to improve understanding. Identifies reliable resources for acquiring knowledge. Sets up systems of procedures to store knowledge for reuse.			by an algorithm • Number of Exercises: 45 • Languages: Available in over 10 languages			
		Knowledge Management Engagement – Acquisition, Collection, Application, and Sharing of Knowledge subscales (Tseng & Fan, 2011)	A	• Response Anchors: Likert Scale • Number of Items: 22	SR	• *Internal Consistency* (.85, .93) (Tseng & Fan, 2011)	• *Job Performance* (.53, IR) (Tseng & Fan, 2011)
22	**Active Learning** - Understands the implications of new information for both current and future problem-solving and decision-making.	*No Suitable Measures to Assess the Attribute as Defined*					
23	**Cognitive Flexibility** - Considers new approaches to solving problems, create new plans and ideas, and initiate and accept change and innovation.	Cognitive Flexibility Scale (Martin & Rubin, 1995)	A	• Response anchors: 6-point Likert-type rating scale (1 = Strongly Disagree to 6 = Strongly Agree) • Dimensions: awareness that in any given situation there are options and alternatives available, willingness to be flexible and adapt to the situation, capability of being flexible • Number of Items: 12	SR	• *Internal Consistency* (.76, .77) (Martin & Rubin, 1995) (.82) (Martin et al., 1998) (.74) (Orakcı, 2021) (.83) (Zuo et al., 2019)	• *Counter-productive Work Behavior (CWB)* (-.40, -.35) (Martin et al., 1998) • *Creativity* (.23) (Zuo et al., 2019)
		Gamified Set-Shifting Task (GSST) (Hommel et al., 2022) / based on the Wisconsin Card Sorting Test (WCST) or the Dimensional Change Card Sort - NIH Toolbox Cognition Battery (NIHTB-CB) (National Institutes of Health , 2022)	A / P	• Response format: Matching products to target groups according to common characteristics	G	• *Internal Consistency* (WCST) (.90, .95, SH) (Steinke et al., 2021) (NIHTB-CB) (.82, .84) (Karr et al., 2022) (.77) (Heaton et al., 2014) • *Test-Retest Reliability* (NIHTB-CB) (.90, approximately 15.5 days)	• *Educational Achievement* (.21, .22) (Hommel et al., 2022)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
						(Heaton et al., 2014) (.92, ICC) (Karr et al., 2022)	
24	**Interpersonal Tact** - Demonstrates proficient interaction with others. Effectively adjusts behaviors when interacting with others. Understands character and motives of others, and modifies personal behavior accordingly.	Political Skill Inventory (PSI) – Social Astuteness subscale (Ferris et al., 2005)	A	• Number of Items: 5 • Response Anchors: Likert-type Rating Scale (1 = Strongly Disagree 7 = Strongly Agree)	SR / OR	• *Internal Consistency* (.79) (Ferris et al., 2005) (.67) (Blickle et al., 2009) (.66, .68) (Momm et al., 2013) (.78) (Blickle et al., 2012) (.86) (Brouer et al., 2015) (.83) (Zhou et al., 2015) (.73) (Wihler et al., 2017) (.65) (Kwon, 2020) (.88) (Campagna et al., 2020) (.71) (Shi, Chen, & Zhou, 2011) (.78) (Blickle et al., 2022)	• *Job Performance* (.06) (Brouer et al., 2015) (.36, SR) (Kwon, 2020) (.30) (Shi et al., 2011) (.27) (Blickle et al., 2022) • *Adaptive Performance* (.27) (Blickle et al., 2022) • *Sales Performance* (.03, .20) (Blickle et al., 2012) • *Safety Performance* (e.g., Injury Reduction) (.01, .09) (Zhou et al., 2015) • *Altruism* (.39) (Shi et al., 2011) • *Positive Impression Management* (.05, .23) (Brouer et al., 2015) • *Personal Initiative* (.47) (Wihler et al., 2017) • *Subordinate Trust* (.38) (Campagna et al., 2020) • *Leader Effectiveness* (.28) (Campagna et al., 2020) • *Relationship Conflict* (-.20) (Campagna et al., 2020) • *Job Satisfaction* (-.05, .00) (Zhou et al., 2015) • *See, also, Munyon et al.* (2015) *meta-analysis on political skill criterion-*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
							related validities
		Hogan Personality Inventory (HPI) – Interpersonal Sensitivity Dimension – IPIP version available (Goldberg, 2022; Hogan & Hogan, 2007)	C / P	• Number of Items: 30 • Response Anchors: True-False • Dimensions: Easy to live with, Sensitive, Caring, Likes People, Hostility	SR	• *Internal Consistency* (.70) (Kaiser & Hogan, 2011) (.75) (Sanger et al., 2019) (.70) (Furnham & Treglown, 2022)	• *Forceful Leadership Behavior* (-.26) (Kaiser & Hogan, 2011) • *Altruistic Behavior* (.35, .38) (Furnham et al., 2016)
		Social Intelligence Assessments - (Speer et al., 2019)	A	2 Measures: The Situational Social Intelligence Test (SSIT) & Self-Perceived Social Intelligence (SPSI) measures • Number of Items: SSIT: 29 SPSI: 20 • Context: The workplace (for both measures) • Score Range: SSIT: 0 to 110 points SPSI: 20 to 100 • Response Anchors: SSIT: Mark the most and least effective choices, expert keyed SPSI: Likert-type Rating Scale (1 = Not at all True of me 5 = Very true of me)	SJT / SR	• *Internal Consistency* SSIT: (.86) (Speer et al., 2019) (.65) (Speer et al., 2020) (.65) (Wegmeyer et al., 2022) (.86) (Brown et al., 2022) SPSI: (.88) (Speer et al., 2019)	• *Interviewer Performance – Accuracy* (i.e.., selecting accurate interview questions) SSIT: (.22) (Speer et al., 2019) (.25) (Wegmeyer et al., 2022) SPSI: (-.10) (Speer et al., 2019) • *Interviewer Performance – Quality* (i.e.., selecting effective interview questions) SSIT: (.29) (Speer et al., 2019) (.49) (Speer et al., 2020) (.49) (Wegmeyer et al., 2022) SPSI: (.14) (Speer et al., 2019)
25	**Problem Sensitivity** - Identifies when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a	Abbreviated Torrance Test for Adults (ATTA) – "Just Suppose" task (Goff & Torrance, 2002)	A / C	• Number of Items: 1 • Rating Information: Responses are rated in terms of fluency (i.e., number of responses) and originality (i.e., number of uncommon responses)	CR	• *Internal Consistency* (.87) (Meier et al., 2021) • *Interrater Reliability* (.88, .97) (Meier et al., 2021)	• *Personal Achievement 50 Year Lag* (.20, .29) (Runco et al., 2010) • *Creative Performance on a Marketing Task* (.59)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	problem.	(see, also, The common problems, consequences, and improvement tasks from the verbal section of the Torrance test of Creative Thinking) (Torrance, 2022)		• Time Limit: 3 minutes • Time Commitment: 15 minutes • Languages: English and Spanish • Administration Format: In-person, proctored		(.95, 1.00) (Althuizen et al., 2010) (.96, .99, ICC) (Althuizen, 2012) • *IRT Marginal Reliability* (.87, .93) (Said-Metwaly et al., 2020)	(Althuizen et al., 2010) (.59) (Althuizen, 2012) • *Creative Career Achievement* (.40) (Althuizen, 2012)
		National Criminal Justice Officer Selection Inventory Squared (NCJOSI²) – Problem Sensitivity Dimension - (Industrial / Organizational Solutions, 2022)	C	• Forms: 2 • Number of Items: 80 (entire cognitive assessment) • Time Commitment: 165 minutes (entire assessment)	AT	• *Proprietary*	• *Proprietary*
26	**Oral and Nonverbal Comprehension** - Listens to and comprehends instructions and other related messages. Pays attention to nonverbal cues to help clarify/interpret messages. Asks questions as appropriate.	American Council on the Teaching of Foreign Languages Listening Proficiency Test (ACTFL LPT) – Language Testing International (LTI, 2022a)	C	• Administration Format: Proctored, Tablet or Computer (CAT) • Response Format: Multiple Choice questions (3 per passage) • Dimensions: Functions and purposes of the spoken language the listener comprehends, the content areas and context for which the passages are spoken, the text type that the listener can understand in the language, the range of vocabulary and grammatical structures the listener can understand, the cultural references the listener can understand in the language • Time commitment: 50 to 125 minutes • Rating Scale: Novice (1), Intermediate (2), Advanced (3), Superior (4). Further differentiated into sublevels (Low, Mid, High) • Languages: Available in 11 languages • Number of Items: 10-25 spoken passages, 30-75 items	AT	• *Internal Consistency* (.80, .90) (Tschirner & Bärenfänger, 2013a)	• *Not collected by Test Developer*

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
		Listening Skills Assessment Test (HighMatch, 2022)	C	• Number of Items: 20 • Administration Format: Mobile / Computer-based Simulation (audio-based office situations)	PE	• *Proprietary*	• *Proprietary*
		Diagnostic Analysis of Nonverbal Accuracy (DANVA2) (Nowicki & Duke, 1994; Nowicki, 2015)	A	• Number of Items: 24 per dimension (72 for all adult object scales) • Administration Format: Computer • Dimensions; Facial expressions, Paralanguage, Postures	AT	• *Internal Consistency* (.58, MA) (Olderbak et al., 2021) (.73) (Momm et al., 2015) (.70, KR) (Byron, 2007) (.77, KR) (Byron et al., 2007) (.63) (Bechtoldt et al., 2011) (.58, .64) (Bechtoldt et al., 2019) (.64) (Blickle et al., 2009) Adult Faces: (.77) (Nowicki & Carton, 1993) (.62, .76) (Blickle et al., 2022) Adult Posture: (.78) (Nowicki, 2015) (.40) (Blickle et al., 2022) • *Test-Retest* (.70, MA) (Olderbak et al., 2021) Adult Faces: (.84, 2 months) (Nowicki & Carton, 1993) Adult posture: (.69, two weeks) (Nowicki, 2015)	• *Job Performance* (.08) (Blickle et al., 2022) (.00) (Bechtoldt et al., 2019) • *Adaptive Performance* (.09) (Blickle et al., 2022) • *Job Success* (.12) (Byron et al., 2007) • *Interpersonal Performance* (.30, SR) (Momm et al., 2015) • *Follower Satisfaction with Manager* (.20) (Byron, 2007) • *Leader Effectiveness* (.22) (Byron, 2007) • *Work Engagement* (-.04, four-week lag) (Bechtoldt et al., 2011)
27	**Stress Tolerance** - Capacity to maintain emotional control	Navy Computer Adaptive Personality	G	• Number of Items: 119 (item bank)	FC	• *Internal Consistency* (.84)	• *Job Performance* (.27, CMA)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
	and composure under pressure.	Scales – Stress Tolerance Subscale (Houston et al., 2006)				(Houston et al., 2006)	(Kantrowitz et al., 2019) (.02, SR, CMA) (Kantrowitz et al., 2019) (.04, task performance, CMA) (Kantrowitz et al., 2019) (.17, .20) (Houston et al., 2006) (.37, entire CAPS measure) (Houston et al., 2006)
		Hogan Personality Inventory (HPI) – Stress Tolerance subscale (Goldberg, 2022; Hogan & Hogan, 2007)	C / P	• Number of Items: 25 • Response Anchors: True-False	SR	• *Internal Consistency* (.86) (Furnham, 2017)	• *Motivation* (.12) (Ryan et al., 1998) • *Training Program Attendance* (-.08) (Ryan et al., 1998)
		5 Dimensional Curiosity (5DC) / 5 Dimensional Curiosity – Revised (5DCR) – Stress Tolerance Subscale (Kashdan et al., 2018; Kashdan, Disabato, et al., 2020)	A	• Number of Items: 4 to 5 • Response Anchors: Likert-type Rating Scale (1 = Does not Describe me at all 7 = Completely Describes me)	SR	• *Internal Consistency* (.87, .90) (Kashdan et al., 2018) (.68) (Birenbaum et al., 2019) (.88, .90, OM) (Kashdan, Disabato, et al., 2020) (.81, .88) (Kashdan, Goodman, et al., 2020) (.88, OM) (Grüning & Lechner, 2023) • *Test-Retest* (.71, 2 months) (.71, 8 months) (Kashdan, Disabato, et al., 2020) (.70, 2 weeks) (Grüning & Lechner, 2023)	• *Innovative Behavior* (.17) (Kashdan et al., 2018) (.50) (Kashdan, Goodman, et al., 2020) • *Work Engagement* (.20, .27) (Kashdan, Disabato, et al., 2020) (.37, .46) (Kashdan, Goodman, et al., 2020) • *Burnout* (-.35) (Kashdan, Disabato, et al., 2020) (-.34, -.43) (Kashdan, Goodman, et al., 2020) • *Physical Health* (.12) (Grüning & Lechner, 2023) • *Job Satisfaction* (.33) (Kashdan, Goodman, et al., 2020) • *Job Crafting Behavior* (.26) (Kashdan, Goodman, et al.,

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence [c]	Criterion-related Validity Evidence (r)[d]
							2020)
28	**Sustains a Climate of Trust** - Assesses factors or conditions that promote or hinder trust. Keeps people informed of goals, actions, and results. Follows through on actions related to expectations of others. Is firm, fair, and respectful to gain trust.	*No Suitable Measures to Assess the Attribute as Defined*					
29	**Cooperation** - Compliant, non-critical, trusting, cordial, and easy to get along with.	Tailored Adaptive Personality Assessment System (TAPAS) / Non-commissioned Officer Special Assignment Battery (NSAB) – Cooperation subscale (Drasgow et al., 2012)	A / G	• Administration Format: Computer (CAT or fixed length) • Response format: Selecting the statements (matched in social desirability and extremity) that is "more like me" • Number of Items: 120 (total test, fixed-length version), 62 (cooperation subscale bank), 46 (cooperation subscale bank – second pool) • Time commitment: Median 20 minutes (total test, fixed-length version)	FC	• *IRT Marginal Reliability* (.65) (Carretta & Ree, 2018) • *Test-Retest* (.37) (Trent et al., 2020)	• *Job Performance* (.03, CMA) (Drasgow et al., 2012) (-.01, PR, CMA) (Kantrowitz et al., 2019) (.07, recruiter sample) (Nye et al., 2020) • *Training Performance* (.05, CMA) (Drasgow et al., 2012) (-.03, CMA) (Kantrowitz et al., 2019) • *Fitness Performance* (.13, CMA) (Drasgow et al., 2012) (-.03, CMA) (Kantrowitz et al., 2019) • *Contextual Performance* (.17, CMA) (Drasgow et al., 2012) • *CWB* (-.23, CMA) (Drasgow et al., 2012) (-.01, CMA) (Kantrowitz et al., 2019) • *CWB intentions* (-.14, -.19) (Trent et al., 2020) • *Leadership Effectiveness* (.05) (Drasgow et al., 2012) • *Army Commitment* (.17, recruiter sample) (Nye et al., 2020) • *Well-Being* (.09) (Conte et al., 2017)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
							• *Strain* (-.08, recruiter sample) (Nye et al., 2020) • *Effort* (.01) (Conte et al., 2017) • *Discipline* (.08) (Conte et al., 2017) • *Attrition Cognitions* (-.03, CMA) (Kantrowitz et al., 2019) • *Attrition* (-.03, -.08, CMA, across 2- and 4-year time lags) (Drasgow et al., 2012) (-.01, .00, CMA, across several time lags) (Kantrowitz et al., 2019)
		Abridged Big Five Dimensional Circumplex – Cooperation Subscale (AB5C) - IPIP (Goldberg, 2022)	P	• Availability: Available for use from the IPIP database • Response anchors: Likert-type scale • Number of items: 12	SR	• *Internal Consistency* (.73) (Bucher & Samuel, 2019) (.84) (Bäckström et al., 2009)	
		WonScore Personality Assessment – Cooperation Facet (Wonderlic, 2022)	C		SR	• *Proprietary*	• *Proprietary*
30	**Resilience** - Quickly recovers from setbacks. Focuses on the mission and objectives during shock, injuries, and stress. Maintains organizational focus despite adversity. Learns from adverse situations and grows in resilience.	Dispositional Resilience Scale (DRS) / Hardiness Resilience Gauge (HRG) (Bartone et al., 1989; Bartone et al., in press)	A / G	• Number of Items: 45 (also 30 item, DRS-30, and 15 item, DRS-15, versions available) • Response Anchors: Likert-type Rating Scale (0 = not at all true, 3 = completely true) • Dimensions: Commitment, Control, Challenge • Languages: English, Chinese, Norwegian, Italian, Korean	SR	• *Internal Consistency* (.85) (Bartone et al., 1989) (.71, .74) (Maltby & Hall, 2022) (.78, .79) (Kulak et al., 2021) (.79) (Hoopsick et al., 2021) (.81) (Hoopsick et al., 2020) (.38, .74) (Kowalski & Schermer, 2019) (.82) (Thomassen et al., 2018) (.86, .89) (Thomassen et al., 2015) (.62, .73)	• *Job Performance* HRG: (.42) (Bartone et al., in press) • *Adaptive Performance* (.14, .27) (Bartone et al., 2013) • *Safety Performance* (.28) (Hystad & Bye, 2013) • *Educational Achievement (Military Program Score*) (.06) (Bartone et al., 2013) (.10) (Kelly et al., 2014) (*GPA*, *Academic Program Score*)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
						(Hystad et al., 2015) (.73, .80) (Bartone et al., 2017) (.79) (Sandvik et al., 2013) (.61) (Hystad & Bye, 2013) (.79) (Hystad et al., 2011) (.69) (Hystad, Eid, et al., 2011) (.79) (Hystad et al., 2010) (.71) (Hystad et al., 2009) (.78) (Escolas et al., 2013) (.75, SH) (Johnsen et al., 2009) (.79) (Fyhn et al., 2016) (.70) (Bartone et al., 2009) (.74, SH) (Eid et al., 2008) (.82) (Bartone, 1999) (.64, .70) (Britt et al., 2001) (.61) (Bartone et al., 2002) (.73) (Bartone et al., 2008) (.78) (Wong et al., 2014) (.75) (Bartone et al., 2016) (.85) (Ko et al., 2018) (.78, .81) (Soderstrom et al., 2000) (.94) (Dolbier et al., 2001) (.75) (Steinhardt et al., 2003) (.75, .80) (McCalister et al., 2006) (.77)	(-.01) (Kelly et al., 2014) (*Special Forces Graduation*) (1.033, ARR) (Bartone et al., 2008) (*Military Development Score)* (.16, .17) (Bartone et al., 2009) • *Military Rank* (.08) (Thomassen et al., 2015) • *Job Satisfaction* (.39) (Steinhardt et al., 2003) (.34, .40) (McCalister et al., 2006) • *Work Engagement* (.55) (Fyhn et al., 2016) (.17, .51) (Britt et al., 2001) • *Burnout* (-.53) (Fyhn et al., 2016) • *Strain* (-.29, -.40) (Thomassen et al., 2015) (-.28) (Steinhardt et al., 2003) (-.19, academic) (Hystad et al., 2009) (-.71, -.60) (Soderstrom et al., 2000) (-.36, -.29) (McCalister et al., 2006) • *Positive Stress Appraisal* HRG: (.43) (Bartone et al., in press) • *Avoidance Coping* (-.23) (Thomassen et al., 2018) (-.28, -.22) (Bartone et al., 2017) • *Rumination* (-.29)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
						(Teng, Brannick, & Borman, 2020) HRG: (.91, .95) (.85, .95, OM) (Bartone et al., in press) • *Test-Retest* (.78, 3-weeks) (Bartone, 2007) (.80, .81, ICC, 3-weeks) (Ko et al., 2018) HRG: (.81, 3 weeks) (Bartone et al., in press)	(Kowalski & Schermer, 2019) • *Mindfulness* (.51) (Kowalski & Schermer, 2019) • *Problematic Alcohol Use After Deployment* (.98, ARR) (Kulak et al., 2021) • *CWB: Drug or Alcohol Abuse* (-.18, -.15) (Hoopsick et al., 2020) (-.16, -.14) (Bartone et al., 2017) • *CWB: Absence* (-.09) (Hystad, Eid, & Brevik, 2011) (-.07) (Fyhn et al., 2016) • *Post-Traumatic Stress Symptoms* (-.36) (Hoopsick et al., 2021) (-.35) (Hoopsick et al., 2020) (-.41, -.20) (Thomassen et al., 2018) (-.39) (Escolas et al., 2013) • *Post-Traumatic Growth* (.19) (Bartone & Bowles, 2021) • *Physical Health* (.05) (Fyhn et al., 2016) (.27) (Hystad et al., 2009) (.01, .16, cardiovascular) (Bartone et al., 2016) (.33, .65) (Soderstrom et al., 2000) • *Physical Fitness* (*Physical Program Score*) (.05) (Kelly et al., 2014)

Rank	KSAO & Definition	Measure (*Source*)	Domain[a]	Features	Format[b]	Reliability Evidence[c]	Criterion-related Validity Evidence (r)[d]
							• *Transformational Leadership* (.01, .47) (Johnsen et al., 2009) • *Transactional Leadership* (.01, .49) (Johnsen et al., 2009) • *Passive-Avoidant Leadership* (-.49, .15) (Johnsen et al., 2009) • *Team Cohesion* (.21) (Thomassen et al., 2015) (.23) (Steinhardt et al., 2003)
		5 x 5 Resilience Scale (DeSimone et al., 2017)	A	• Number of Items: 25 • Dimensions: Adaptability, Emotion Regulation, Optimism, Self-Efficacy, Social Support • Response Anchors: Likert-type Rating Scale (1 = Very Inaccurate 5 = Very Accurate)	SR	• *Internal Consistency* (.85, .93) (DeSimone et al., 2017) (.86) (White et al., 2021) (.85, .93) (Teng, Brannick, & Borman, 2020)	• *Educational Achievement (GPA)* (.05) (Teng, Brannick, & Borman, 2020) • *Strain* (-.60) (Teng, Brannick, & Borman, 2020) • *Rumination* (-.55) (DeSimone et al., 2017) • *Leadership Effectiveness* (.24) (White et al., 2021)
		The Resilience Questionnaire (Talogy, 2022a)	C	• Number of Items: 54 • Time Commitment: 10 minutes • Dimensions: Self-belief, Optimism, Purposeful Direction, Adaptability, Challenge Orientation, Ingenuity, Emotional Regulation, Support Seeking	SR	• *Proprietary*	• *Proprietary*

Appendix B
Linkage of ATAF KSAO List to Career Long Assessments: Athena

*Blue boxes indicate the Athena KSAOs. Under each blue box are the ATAF KSAOs linked to the Athena talent attribute.

Talent Domain	Talent	Measurable KSAO	Definition
		Adaptability	
Disposition	Openness to Experience	Adaptability	Modifies behavior or plans as necessary to reach goals. Is able to maintain effectiveness in varying environments with various tasks, responsibilities, or people.
Cognitive	Decision-Making	Mental Agility	Flexibility of mind; the ability to break habitual thought patterns. Anticipating or adapting to uncertain or changing situations; to think through outcomes when current decisions or actions are not producing desired effects. Ability to apply multiple perspectives and approaches.
Interpersonal	Cultural Awareness	Cultural/Interpersonal Adaptability	Modifies one's style and behavior to fit the situation and culture; open-minded.
		Communicative Skills (Reading)	
Communication	General Communication	Communicator	Precise, efficient, and compelling in both written and spoken word.
Communication	Written Communication	Reading Comprehension	Understands written sentences and paragraphs in instructions, operator's manuals, basic textbooks, letters of instructions, written orders, and job directives.
Cognitive	Reasoning	Verbal Reasoning	Reasons and draw conclusions based on verbal or written materials.
		Communicative Skills (Writing)	
Communication	General Communication	Communicator	Precise, efficient, and compelling in both written and spoken word.
Communication	Written Communication	Written Communication	Communicates written information and ideas to others in a clear, accurate, concise, grammatically correct, and well-organized manner.
Cognitive	Reasoning	Verbal Reasoning	Reasons and draw conclusions based on verbal or written materials.
		Conflict Resolution/Management	
Interpersonal	Teamwork	Conflict Management	Anticipates and takes steps to prevent counterproductive confrontations. Manages and resolves conflicts and disagreements in a constructive manner.

Talent Domain	Talent	Measurable KSAO	Definition
Leadership & Management	Leadership	Motivating Others	Generates support, involvement, energy, and enthusiasm for the mission among subordinates and others using appropriate influence techniques (e.g., inspiration, role modeling, collaboration, persuasion, mentoring, conflict management, etc.) given the mission, time, and conditions.
		Critical Thinking (Mindsets/Skills)	
Cognitive	General Cognitive Ability	General Cognitive Aptitude	Capacity to understand and interpret information that is being presented, ability to identify and solve problems, and capability to learn new things quickly and efficiently.
Cognitive	Reasoning	Critical Thinking	Uses logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
Cognitive	Decision Making	Decision Making	Makes decisions based on accurate and appropriate assessment of the costs/benefits and short- and long-term consequences of alternative actions and solutions. Makes timely decisions with incomplete information, while refraining from making hasty decisions in the absence of necessary information.
Cognitive	Problem Solving	Problem Solver	Capacity to choose between best practices and unorthodox approaches to reach a solution. Accomplishes the task.
Cognitive	Problem Solving	Structured Problem Solving	Analyzes readily obtained information and evaluates results to select the best solution from a set of existing approaches to solve a problem.
Cognitive	Problem Solving	Unstructured Problem Solving	Identifies complex problems, gathers related information, evaluates information relevance, evaluates the credibility of alternative information sources, and generates alternative solutions.
Cognitive	Meta-Cognition	Awareness of Cognitive Biases	Realizes one's personal biases, predispositions, or inclinations in thinking when looking for solutions to problems.
Communication	General Communication	Encourages Discourse	Promotes discussion and recognizes the importance of considering input from diverse perspectives.
		Emotional Intelligence	
Disposition	Emotional Stability	Emotional Control	Acts rationally, displays a generally calm and even mood, and maintains composure and is not overly distraught by stressful situations.
Disposition	Emotional Stability	Self-Control	Tends to be cautious, levelheaded, patient, and able to delay gratification.

Talent Domain	Talent	Measurable KSAO	Definition
Disposition	Empathy	Empathy	Can experience something from another person's point of view. Ability to identify with and enter into another person's feelings and emotions. Desire to care for and take care of Soldiers and others.
Disposition	Stress Tolerance	Stress Tolerance	Capacity to maintain emotional control and composure under pressure.
Interpersonal	Social Skills	Interpersonal Tact	Demonstrates proficient interaction with others. Effectively adjusts behaviors when interacting with others. Understands character and motives of others, and modifies personal behavior accordingly.
Interpersonal	Social Skills	Social Perceptiveness	Accurately perceives and understands other people's motives, attitudes, and feelings based on what they do or say, and accurately perceives one's own impact on the behavior of others.
		Interpersonal Skills	
Interpersonal	Social Skills	Interpersonal Relationship Building	Develops and maintains effective working relationships with others. Understands how to leverage relationships to achieve objectives.
Interpersonal	Social Skills	Interpersonal Tact	Demonstrates proficient interaction with others. Effectively adjusts behaviors when interacting with others. Understands character and motives of others, and modifies personal behavior accordingly.
Interpersonal	Social Skills	Perspective Taking	Skill in understanding how people interpret events and interpersonal interactions.
Interpersonal	Social Skills	Social Perceptiveness	Accurately perceives and understands other people's motives, attitudes, and feelings based on what they do or say, and accurately perceives one's own impact on the behavior of others.
Interpersonal	Teamwork	Conflict Management	Anticipates and takes steps to prevent counterproductive confrontations. Manages and resolves conflicts and disagreements in a constructive manner.
Interpersonal	Teamwork	Cooperation/Teamwork	Works collaboratively with others to solve problems and achieve group goals and objectives.
Interpersonal	Teamwork	Coordination	Adjusting actions in relation to others' actions.
Interpersonal	Teamwork	Fosters Teamwork, Cohesion, Cooperation, Loyalty and Esprit de Corps	Encourages people to work together effectively. Promotes teamwork and team achievement to build trust. Draws attention to the consequences of poor coordination. Integrates new members into the unit quickly.

Talent Domain	Talent	Measurable KSAO	Definition
Leadership & Management	Leadership	Consensus Building	Builds effective working relationships. Uses two-way, meaningful communication. Identifies individual and group interests. Identifies roles and resources. Generates and facilitates generation of possible solutions. Applies fair standards to assess options.
		Leadership Skills	
Interpersonal	Teamwork	Team Building	Assembles a team of people that work together effectively. Identifies and effectively utilizes the appropriate mix of mission-relevant skills. Fosters group identity and cohesion by clearly communicating team goals, and encouraging and rewarding cooperation among team members.
Interpersonal	Teamwork	Team Development	Presents challenging assignments for team or group interaction. Provides resources and support for realistic, mission-oriented training. Sustains and improves the relationships among team or group members. Provides feedback on team processes.
Interpersonal	Teamwork	Team Planning	Organizes and orients team members to meet goals. Changes organization and focus of group to meet changing missions and conditions.
Interpersonal	Teamwork	Coordinating Multiple Groups	Coordinates the efforts of multiple, diverse groups to accomplish a mission.
Leadership & Management	Leadership	Consensus Building	Builds effective working relationships. Uses two-way, meaningful communication. Identifies individual and group interests. Identifies roles and resources. Generates and facilitates generation of possible solutions. Applies fair standards to assess options.
Leadership & Management	Leadership	Encourages subordinates to exercise initiative, accept responsibility and take ownership	Involves others in decisions and informs them of consequences. Allocates responsibility for performance. Guides subordinate leaders in thinking through problems for themselves. Allocates decision-making to the lowest appropriate level. Acts to expand and enhance subordinate's competence and self-confidence. Rewards initiative.
Leadership & Management	Leadership	Improves the Organization	Makes decisions and takes action to improve the organization beyond their tenure.
Leadership & Management	Leadership	Inspirational Leader	Motivates teams to work harmoniously and productively towards a common goal.
Leadership & Management	Leadership	Leads By Example	Serves as a decisive leader and positive role model who upholds standard and Army Ethic (legal and moral Army principles).

Talent Domain	Talent	Measurable KSAO	Definition
Leadership & Management	Leadership	Motivating Others	Generates support, involvement, energy, and enthusiasm for the mission among subordinates and others using appropriate influence techniques (e.g., inspiration, role modeling, collaboration, persuasion, mentoring, conflict management, etc.) given the mission, time, and conditions.
Leadership & Management	Leadership	Organizational Perspective	Assesses situations, missions, and assignments to determine the parties involved in decision-making, decision support, and possible interference or resistance.
Leadership & Management	Leadership	Peer Leadership	Seeks positions of authority among peers. Comfortable with being in charge of a group and accepts responsibility for the group's performance.
Leadership & Management	Leadership	Shared Leadership	Organizes and orients team members to meet goals. Changes organization and focus of group to meet changing missions and conditions.
Leadership & Management	Sustains Climate & Morale	Balances Mission and Welfare of Followers	Assesses and routinely monitors effects of mission fulfillment on mental, physical, and emotional attributes of subordinates. Monitors morale, physical condition, and safety of subordinates. Provides appropriate relief when conditions jeopardize success of the mission or present overwhelming risk to personnel. Addresses subordinates' and families' needs (health, welfare, and development). Stands up for subordinates. Routinely monitors morale and encourages honest feedback.
Leadership & Management	Sustains Climate & Morale	Sustains a Climate of Trust	Assesses factors or conditions that promote or hinder trust. Keeps people informed of goals, actions, and results. Follows through on actions related to expectations of others. Is firm, fair, and respectful to gain trust.
		Learning Skills	
Cognitive	Meta-Cognition	Analyzes and Organizes Information to Create Knowledge	Reflects on prior learning; organizes insights for future application. Considers source, quality or relevance, and criticality of information to improve understanding. Identifies reliable resources for acquiring knowledge. Sets up systems of procedures to store knowledge for reuse.
Cognitive	Reasoning	Active Learning	Understands the implications of new information for both current and future problem-solving and decision-making.
Communication	General Communication	Language Learning Ability	Cognitive capacity to learn new languages.
Disposition	Motives	Learning Orientation	Seeks out learning opportunities, enjoys acquiring new knowledge and skills, and is comfortable applying new knowledge and skills on the job.

Talent Domain	Talent	Measurable KSAO	Definition
Leadership & Management	Performance Management	Improves Unit Performance	Employs learning strategies to improve unit performance. Uses assessment techniques and evaluation tools (such as after action reviews) to identify lessons learned and facilitate consistent improvement. Determines the appropriate setting and timing for feedback.
Leadership & Management	Training and Developing Others	Creates a Learning Environment	Uses effective assessment and training methods. Encourages leaders and their subordinates to reach their full potential. Motivates others to develop themselves. Expresses the value of interacting with others and seeking counsel. Stimulates innovative and critical thinking in others. Seeks new approaches to problems. Communicates differences between professional standards and a zero-defects mentality. Emphasizes learning from one's mistakes.
		Personality/Mental Toughness	
Disposition	Agreeableness	Affiliation	Engages socially with others, participates in groups easily, and is seen by others as friendly and open, not shy and reserved.
Disposition	Agreeableness	Consideration	Considerate of others. Affectionate, compassionate, sensitive, and caring.
Disposition	Agreeableness	Cooperation	Compliant, non-critical, trusting, cordial, and easy to get along with
Disposition	Agreeableness	Humility	Is honest, to puts others' needs or needs of the mission before their own, and does not focus on being the center of attention.
Disposition	Agreeableness	Selflessness	Generous with one's time and resources.
Disposition	Conscientiousness	Achievement Orientation	Sets high personal goals and standards, is willing to give one's best effort, works hard to achieve difficult objectives, is confident and resourceful in striving for accomplishment.
Disposition	Conscientiousness	Dependability	Trustworthy, reliable, planful, and accountable. Respects the value of discipline. Does not shy away from responsibility. Makes effort to keep promises.
Disposition	Conscientiousness	Detail-Focused & Precise	Attentive to detail and thorough, accurate, and precise in completing a task.
Disposition	Conscientiousness	Discipline	Decisions and actions consistent with the Army Values; willing obedience to lawful orders.
Disposition	Conscientiousness	Introspective	Contemplative by nature; self-aware.
Disposition	Conscientiousness	Non-Delinquency	Complies with rules, customs, norms, and expectations, and tends not to challenge authority.
Disposition	Conscientiousness	Orderliness	Organizes tasks and activities and desires to maintain neat and clean surroundings.

Talent Domain	Talent	Measurable KSAO	Definition
Disposition	Conscientiousness	Persistence	Focuses on tasks and activities until they are completed and is determined to accomplish their goals even in the face of obstacles.
Disposition	Conscientiousness	Prudent Risk-Taker	Acts boldly yet maintains appropriate focus upon personal, Soldier, and Unit safety.
Disposition	Conscientiousness	Self-Management	Effectively manages the full range of one's work and nonwork responsibilities (e.g., setting and prioritizing goals, allocating effort and personal resources, and assessing own performance).
Disposition	Conscientiousness	Virtue	Adheres to standards of honesty, morality, and selfless and charitable behavior.
Disposition	Emotional Stability	Adjustment	Is worry free, and handles stress well; low scoring individuals are generally high strung, self-conscious and apprehensive.
Disposition	Emotional Stability	Emotional Control	Acts rationally, displays a generally calm and even mood, and maintains composure and is not overly distraught by stressful situations.
Disposition	Emotional Stability	Even-Tempered	Calm and stable; does not often exhibit anger, hostility, or aggression.
Disposition	Emotional Stability	Hostility To Authority	Suspicious of the motives and actions of legitimate authority figures. Views rules and directives from authority as illegitimate.
Disposition	Emotional Stability	Machiavellianism	Deceives and manipulates others for personal gain.
Disposition	Emotional Stability	Optimism	Tends to have positive outlook on life and tends to experience joy and a sense of well-being.
Disposition	Emotional Stability	Resilience	Quickly recovers from setbacks. Focuses on the mission and objectives during shock, injuries, and stress. Maintains organizational focus despite adversity. Learns from adverse situations and grows in resilience.
Disposition	Emotional Stability	Self-Control	Tends to be cautious, levelheaded, patient, and able to delay gratification.
Disposition	Empathy	Empathy	Can experience something from another person's point of view. Ability to identify with and enter into another person's feelings and emotions. Desire to care for and take care of Soldiers and others.
Disposition	Extraversion	Assertiveness	Socially dominant, influential, energetic, and takes charge.
Disposition	Extraversion	Attention Seeking	Engages in behaviors that attract social attention; loud, talkative, entertaining, and even boastful.
Disposition	Extraversion	Enthusiasm	Experiences positive emotions and enjoys the company of others.

Talent Domain	Talent	Measurable KSAO	Definition
Disposition	Extraversion	Initiative	Relies on own abilities to overcome obstacles, and is effective in situations that require a willingness to originate action or take independent action to achieve a goal.
Disposition	Extraversion	Sociability	Interest and engages in friendly social interactions.
Disposition	Openness to Experience	Curiosity	Inquisitive and perceptive; interested in learning new information and attend courses and workshops whenever possible.
Disposition	Openness to Experience	Innovative	Creative, inquisitive, and insightful. Easily identifies new solutions and catalyzes change.
Disposition	Openness to Experience	Intellectual Efficiency	Scholarly and academically oriented; described by others as knowledgeable, astute, and intellectual; Processes information quickly.
Disposition	Openness to Experience	Tolerance	Interested in other cultures and opinions that may differ from one's own. Willing to adapt to novel environments and situations.
Disposition	Openness to Experience	Tolerance for Ambiguity	Capacity to tolerate work situations where the right goal or the correct path to the goal is unclear, vague, or ill-defined.
Disposition	Openness to Experience	Adaptability	Modifies behavior or plans as necessary to reach goals. Is able to maintain effectiveness in varying environments with various tasks, responsibilities, or people.
Disposition	Stress Tolerance	Stress Tolerance	Capacity to maintain emotional control and composure under pressure.
		Physical Fitness	
Physical	General Fitness	Health and Fitness Orientation	Tends to maintain good health and physical conditioning by prioritizing good nutrition, physical exercise, and adequate sleep. Committed to a lifestyle of physical fitness.
Physical	General Fitness	Physical Endurance	Exerts oneself physically over long periods of time without getting winded or out of breath.
Physical	General Fitness	Physical Strength	Meets the physical strength demands of Army work (i.e., push, pull, carry, or throw objects; propel).
Physical	General Fitness	Physically Fit	Engages in activities to maintain physical conditioning, including vigorous sports or exercise. Performs well even under extreme physiological duress. Physically tough, gritty, and tenacious.
Physical	General Fitness	Swimming	Swims capably; using water survival skills; avoiding water hazards.
		Situation Awareness	
Cognitive	Situational Awareness	Situational Awareness	Perceives what is happening in the immediate environment and is rarely surprised. Rapidly understands how information, events, and actions will impact current and near-term goals and objectives.

Talent Domain	Talent	Measurable KSAO	Definition
Cognitive	Attention Control	Attentiveness	Focuses on the problem or situation and shifts attention between activities when appropriate.
Cognitive	Attention Control	Problem Sensitivity	Identifies when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
		Social Skills	
Communication	Active Listening	Active Listening	Carefully attends to and understands both the overt and implied meaning of oral communications from others by accurately perceiving the content, context, and tone of the speaker; not interrupting at inappropriate times.
Communication	General Communication	Communication Ability	Uses verbal and nonverbal means to maintain listener interest. Adjusts information sharing strategy based on operating conditions. Ensures prompt information dissemination to all levels. Avoids miscommunication through verifying a shared understanding.
Communication	General Communication	Intercultural Communication	Communicates effectively with people from different cultures or nationalities.
Communication	Oral Communication	Oral and Nonverbal Comprehension	Listens to and comprehends instructions and other related messages. Pays attention to nonverbal cues to help clarify/interpret messages. Asks questions as appropriate.
Communication	Oral Communication	Oral Communication Skill	Speaks in a clear, organized, and logical manner. Communicates information or asks questions in an efficient and understandable way. Adapts communication styles to different situations. Uses nonverbal gestures to supplement and reinforce spoken messages.
Interpersonal	Social Skills	Interpersonal Relationship Building	Develops and maintains effective working relationships with others. Understands how to leverage relationships to achieve objectives.
Interpersonal	Social Skills	Interpersonal Tact	Demonstrates proficient interaction with others. Effectively adjusts behaviors when interacting with others. Understands character and motives of others, and modifies personal behavior accordingly.
Interpersonal	Social Skills	Perspective Taking	Skill in understanding how people interpret events and interpersonal interactions.
Interpersonal	Social Skills	Social Perceptiveness	Accurately perceives and understands other people's motives, attitudes, and feelings based on what they do or say, and accurately perceives one's own impact on the behavior of others.
		Systems Thinking	

Talent Domain	Talent	Measurable KSAO	Definition
Cognitive	Systems Thinking	Strategic Thinking	Develops a complex, systems-level understanding of the relationship between his/her Army unit or organization and the broader environment and uses that understanding to envision a desirable future state for the unit/organization.
Cognitive	Systems Thinking	Systems Thinking	Conceptualizes and understands relationships and arrangements within and between relevant components and structures.
Expertise & Personal Competence	Tactical/Technical Competence	Knowledge of System Inter-Relations	Capable of analyzing how goals and operations of own unit are inter-related with other units and systems. Can see the larger strategic picture and interpret how one's own unit relates to it.
		Warfighting	
Disposition	Military-Specific	Army Self-Efficacy	Confident in one's abilities to successfully perform the tasks of a Soldier and accomplish their goals in the Army.
Disposition	Military-Specific	Army Values	Models loyalty, duty, respect, selfless service, honor, integrity, and personal courage. Promotes the associated principles, standards, and qualities in others.
Disposition	Military-Specific	Commitment To Serve	Feels an obligation to serve or continue serving in the U.S. Military.
Disposition	Military-Specific	Military And Professional Bearing	Models a professional image of authority. Commanding presence energizes others. Exemplifies adherence to standards through appearance, demeanor, actions, and words.
Disposition	Military-Specific	Warrior Ethos/Service Ethos	Internal shared attitudes and beliefs that embody the spirit of the Army profession for Soldiers and Army Civilians alike.
Expertise & Personal Competence	Tactical/Technical Competence	Knowledge of Combined Arms Operations	Applies and effectively integrates multiple warfighting functions such as direct and indirect fires, communications, intelligence, and combat service support.
Expertise & Personal Competence	Tactical/Technical Competence	Proficiency with Mission Systems	Uses weapons and mission information systems in training or operational contexts to acquire, synthesize, or use information/data to enable or support military operations.
Expertise & Personal Competence	Tactical/Technical Competence	Soldier Common Task Knowledge and Skills	Possesses the necessary knowledge and skill to perform common individual tasks at the appropriate skill level (e.g., land navigation, field survival techniques, and CBRN protection).

Talent Domain	Talent	Measurable KSAO	Definition
Leadership & Management	Sustains Climate & Morale	Warrior Ethos	Removes or fights through obstacles, difficulties, and hardships to accomplish the mission. Demonstrates the commitment to persevere despite adversity, obstacles, and challenges. Demonstrates physical and emotional courage. Shares hardships with subordinates.