

LISA M. HARRINGTON, CAITLIN LEE, SANDRA KAY EVANS, SEAN MANN,
HANNAH ACHESON-FIELD, BART E. BENNETT, WENJING HUANG,
BARBARA BICKSLER, KATHERINE BARLOW

Success in a Joint Environment

Additional Appendixes Containing Detailed Findings and
Supporting Analyses



For more information on this publication, visit www.rand.org/t/RRA356-1.

About RAND

RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. To learn more about RAND, visit www.rand.org.

Research Integrity

Our mission to help improve policy and decisionmaking through research and analysis is enabled through our core values of quality and objectivity and our unwavering commitment to the highest level of integrity and ethical behavior. To help ensure our research and analysis are rigorous, objective, and nonpartisan, we subject our research publications to a robust and exacting quality-assurance process; avoid both the appearance and reality of financial and other conflicts of interest through staff training, project screening, and a policy of mandatory disclosure; and pursue transparency in our research engagements through our commitment to the open publication of our research findings and recommendations, disclosure of the source of funding of published research, and policies to ensure intellectual independence. For more information, visit www.rand.org/about/research-integrity.

RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

Published by the RAND Corporation, Santa Monica, Calif.

© 2024 RAND Corporation

RAND® is a registered trademark.

Cover: Miriam Thurber/U.S. Air Force; max_776/Adobe Stock.

Limited Print and Electronic Distribution Rights

This publication and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited; linking directly to its webpage on rand.org is encouraged. Permission is required from RAND to reproduce, or reuse in another form, any of its research products for commercial purposes. For information on reprint and reuse permissions, please visit www.rand.org/pubs/permissions.

Preface

Strengthening joint leaders and teams is an Air Force enterprise initiative aimed at optimizing leaders and teams so that they can consistently think, plan, and fight in joint environments.¹ To achieve this end state, airmen in the total force (officers, civilians, enlisted airmen, guard members, and reserve personnel) must effectively integrate and lead across the future joint warfighting landscape.

Foundational to this effort is understanding how the Air Force can improve its assessment process to (1) identify airmen with the attributes, qualities, and skills to succeed in joint positions and (2) assign personnel to such jobs more effectively. The attributes that the Air Force focuses on today might not be the same as those required to become a joint leader or team member in a joint environment. Identifying and evaluating additional attributes and qualities is necessary to ensure that airmen are prepared to acquire and take on the demands of a joint leader and in support of joint teams.

The purpose of this research effort was to help the Air Force recruit airmen with attributes that would position them to succeed in joint environments and, in doing so, improve overall service preparedness for the joint fight in future operating environments. The research identifies key attributes for new recruits and provides recommendations for establishing marketing, assessments, accessions, and recruiting standards to recruit candidates with these attributes.

The results of this work are reported in two volumes:

The main report, *Success in a Joint Environment: Identifying Attributes for Air Force Accessions*, contains a discussion about the methodology, top-level findings, and recommendations for the Air Force.

This report, *Success in a Joint Environment: Additional Appendixes Containing Detailed Findings and Supporting Analyses*, contains detailed results from several steps in the methodology described in this report.

The research reported here was commissioned by the Department of the Air Force and conducted within the Workforce, Development, and Health Program of RAND Project AIR FORCE as part of a fiscal year 2019 project, “Joint Airmen Attributes for Recruiting and Accessions.”

¹ The completion of this report predates the establishment of the Department of the Air Force. In this report, *Air Force* refers only to the U.S. Air Force.

RAND Project AIR FORCE

RAND Project AIR FORCE (PAF), a division of the RAND Corporation, is the Department of the Air Force's (DAF's) federally funded research and development center for studies and analyses, supporting both the United States Air Force and the United States Space Force. PAF provides the DAF with independent analyses of policy alternatives affecting the development, employment, combat readiness, and support of current and future air, space, and cyber forces. Research is conducted in four programs: Strategy and Doctrine; Force Modernization and Employment; Resource Management; and Workforce, Development, and Health. The research reported here was prepared under contract FA7014-16-D-1000.

Additional information about PAF is available on our website: www.rand.org/paf/

This report documents work originally shared with the DAF on September 19, 2019. The draft report, dated September 30, 2019, was reviewed by formal peer reviewers and DAF subject-matter experts.

Contents

Preface	iii
Figures	vi
Tables	x
Abbreviations	xi
Chapter 1. Introduction.....	1
Appendix C. Joint Requirements Deconstruction Results	6
Appendix D. Deconstruction Results of Constituent Constructs	57
Appendix E. Attribute Proximity Measurement.....	83
Appendix F. Analysis of Attributes by Dimension	89
References	108

Figures

Figure 1.1. Deconstructing Joint Requirements	3
Figure C.1. Desired Leader Attribute 1: Understand the Security Environment and Instruments of National Power	9
Figure C.2. Desired Leader Attribute 2: Anticipate and Respond to Uncertainty.....	10
Figure C.3. Desired Leader Attribute 3: Anticipate Change and Lead Transitions	11
Figure C.4. Desired Leader Attribute 4: Operate Through Trust, Empowerment, and Understanding.....	12
Figure C.5. Desired Leader Attribute 5: Make Ethical Decisions.....	13
Figure C.6. Desired Leader Attribute 6: Think Critically and Strategically	14
Figure C.7. Enlisted Desired Leader Attribute 1: Operate Under Mission Command.....	15
Figure C.8. Enlisted Desired Leader Attribute 2: Make Ethical Decisions.....	16
Figure C.9. Enlisted Desired Leader Attribute 3: Strengthen the Total Force	17
Figure C.10. Enlisted Desired Leader Attribute 4: Anticipate, Communicate, and Mitigate Risks	18
Figure C.11. Enlisted Desired Leader Attribute 5: Operate in Joint Environments	19
Figure C.12. Enlisted Desired Leader Attribute 6: Think Critically and Develop Leaders	20
Figure C.13. Joint Publication 1: Competence	21
Figure C.14. Joint Publication 1: Integrity	22
Figure C.15. Joint Publication 1: Moral Courage.....	22
Figure C.16. Joint Publication 1: Physical Courage.....	22
Figure C.17. Joint Publication 1: Courage	23
Figure C.18. Joint Publication 3-0: Capacity to Consider Contrary Views	23
Figure C.19. Joint Publication 3-0: Ethical Leadership	24
Figure C.20. Joint Publication 3-0: Intuition.....	25
Figure C.21. Joint Publication 3-0: Judgment.....	26
Figure C.22. Joint Publication 3-0: Situational Awareness.....	26
Figure C.23. Strengthening Joint Leaders and Teams Gap Analysis: Adaptive Leadership.....	27
Figure C.24. Strengthening Joint Leaders and Teams Gap Analysis: Credibility in Joint Context	28
Figure C.25. Strengthening Joint Leaders and Teams Gap Analysis: Joint Forces Integration....	29
Figure C.26. Strengthening Joint Leaders and Teams Gap Analysis: Joint Planning Experience and Processes.....	30
Figure C.27. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Air Force Capabilities and Doctrine	31

Figure C.28. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Command Relationships	31
Figure C.29. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Joint Culture	32
Figure C.30. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Sister-Service Capabilities and Doctrine	32
Figure C.31. Strengthening Joint Leaders and Teams Gap Analysis: Motivation to Succeed in Joint Environments	33
Figure C.32. Strengthening Joint Leaders and Teams Gap Analysis: Operational Artistry.....	33
Figure C.33. Strengthening Joint Leaders and Teams Gap Analysis: Teamwork.....	34
Figure C.34. Strengthening Joint Leaders and Teams Flight Plan: Battle Management Skills	35
Figure C.35. Strengthening Joint Leaders and Teams Flight Plan: Educated	36
Figure C.36. Strengthening Joint Leaders and Teams Flight Plan: Execute Rapid Decisionmaking in Any Type of Conflict	37
Figure C.37. Strengthening Joint Leaders and Teams Flight Plan: Joint Planning Skills.....	38
Figure C.38. Strengthening Joint Leaders and Teams Flight Plan: Overall Motivation	39
Figure C.39. Strengthening Joint Leaders and Teams Flight Plan: Solution-Minded.....	39
Figure C.40. Strengthening Joint Leaders and Teams Flight Plan: Trained	40
Figure C.41. Strengthening Joint Leaders and Teams Flight Plan: Understand How to Optimize Joint Capabilities Across Domains.....	40
Figure C.42. Strengthening Joint Leaders and Teams Flight Plan: Understand Service and Interagency Cultures.....	41
Figure C.43. Strengthening Joint Leaders and Teams Flight Plan: Understand Sister-Service Doctrine	41
Figure C.44. Strengthening Joint Leaders and Teams Flight Plan: Understanding of the Land Domain	42
Figure C.45. Strengthening Joint Leaders and Teams Flight Plan: Visualize Multiple Battlespaces	43
Figure C.46. Joint Officer Handbook: Build Constructive Work Relationships.....	44
Figure C.47. Joint Officer Handbook: Communicate Effectively at Executive Levels and with Diverse Workforce	45
Figure C.48. Joint Officer Handbook: Effectively Manage and Lead Diverse Workforce.....	46
Figure C.49. Joint Officer Handbook: Effectively Prepare, Plan, and Participate in Joint Exercises.....	48
Figure C.50. Joint Officer Handbook: Exhibit Excellent Time-Management Skills	49
Figure C.51. Joint Officer Handbook: Exhibit Joint and Command-Level Mindset	50
Figure C.52. Joint Officer Handbook: Knowledge of Air Force Organization and Capabilities..	51
Figure C.53. Joint Officer Handbook: Knowledge of Combatant Command Authorities and Legal Requirements.....	51

Figure C.54. Joint Officer Handbook: Knowledge of Non-DoD Agencies and Their Relationships with Combatant Commands	52
Figure C.55. Joint Officer Handbook: Maximize Technology Software and Hardware Capabilities	52
Figure C.56. Joint Officer Handbook: Practice Lifelong Learning Behaviors.....	53
Figure C.57. Joint Officer Handbook: Problem-Solving Using Strategic and Critical Thinking ..	54
Figure C.58. Joint Officer Handbook: Understand and Excel in Joint Staff Officer Roles	55
Figure C.59. Joint Officer Handbook: Understand Organization and Missions of Combatant Commands	56
Figure C.60. Joint Officer Handbook: Write, Read, and Conduct Advanced-Level Research	56
Figure D.1. Actively Open-Minded Thinking	58
Figure D.2. Adaptability	59
Figure D.3. Assess Risk.....	60
Figure D.4. Commitment Propensity.....	61
Figure D.5. Communicating Effectively	62
Figure D.6. Creative Thinking.....	63
Figure D.7. Critical Thinking	64
Figure D.8. Emotional Intelligence	64
Figure D.9. Intuition	65
Figure D.10. Military Bearing	66
Figure D.11. Moral Courage	67
Figure D.12. Motivate and Empower Others	68
Figure D.13. Multicultural Competency	69
Figure D.14. Physical Courage.....	70
Figure D.15. Probabilistic Thinking	71
Figure D.16. Psychological Fitness	72
Figure D.17. Selfless Service	73
Figure D.18. Situational Awareness	74
Figure D.19. Strategic Thinking	75
Figure D.20. Supporting Leader Development	76
Figure D.21. Systems Thinking.....	77
Figure D.22. Taking Action and Making Decisions.....	78
Figure D.23. Tenacity	80
Figure D.24. Trustworthiness	81
Figure D.25. Understand Organizational Capacities, Limitations, and Goals	82
Figure D.26. Understand the Environment.....	82
Figure E.1. Attribute Proximity to Desired Leader Attribute Requirements	83
Figure E.2. Attribute Proximity to Enlisted Desired Leader Attribute Requirements	84
Figure E.3. Attribute Proximity to Joint Publication 1 Requirements	84

Figure E.4. Attribute Proximity to Joint Publication 3-0 Requirements	85
Figure E.5. Attribute Proximity to Strengthening Joint Leaders and Teams Gap Analysis Requirements	86
Figure E.6. Attribute Proximity to Strengthening Joint Leaders and Teams Flight Plan Requirements	87
Figure E.7. Attribute Proximity to Joint Officer Handbook Requirements	88

Tables

Table 1.1. Final List of Attributes	3
Table C.1. Joint Requirements Identified and Deconstructed	7
Table D.1. Constituent Constructs Identified and Deconstructed	57

Abbreviations

AFOQT	Air Force Officer Qualifying Test
ASVAB	Armed Services Vocational Aptitude Battery
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
DLA	Desired Leader Attribute
DoD	U.S. Department of Defense
EDLA	Enlisted Desired Leader Attribute
HEXACO PI	HEXACO Personality Inventory
HEXACO PI-R	HEXACO Personality Inventory-Revised
HH	honesty and humility
IPIP	International Personality Item Pool
LGO	learning goal orientation
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
NEO-PI-R	Revised NEO Personality Inventory
PAF	RAND Project AIR FORCE
SDI	Strength Deployment Inventory
TAPAS	Tailored Adaptive Personality Assessment System

Chapter 1. Introduction

Strengthening joint leaders and teams is a top Air Force priority. One area of interest among Air Force leaders is whether it is possible to place more emphasis on joint participation at the earliest stages of an airman's career—in particular, during recruiting and accession.² Researchers from RAND Project AIR FORCE (PAF) investigated whether the Air Force could improve its ability to recruit joint leaders and team members and whether current practices are aligned with this goal.

To explore this concept, we

conducted discussions with Air Force stakeholders to understand current Air Force recruiting processes—including marketing—and accession programs

performed a literature review of materials related to formal assessments used during recruiting and accession

developed an approach to identify attributes from joint development requirements that might signal potential for success in a joint environment in accession candidates

examined various dimensions of proposed attributes that might be a short-term focus during recruiting and accession.

This report contains additional appendixes to the main report with detailed results of the third and fourth steps in our methodology to identify attributes. We developed a definition for the term *attribute* as a basis for this work because no single, agreed-upon definition exists. For the purpose of this study, an *attribute* is

a characteristic, quality, or feature of an individual. Attributes include

- adjectives that are used to describe an individual (e.g., trustworthy)
- nouns that refer to a quality an individual possesses (e.g., honesty, curiosity, self-control)
- verb phrases that refer to the way an individual is (e.g., calm under pressure).

Identifying the Attributes

We searched Joint Staff and Air Force sources that outline the central tenets of joint development to determine whether a set of attributes exists that might indicate joint potential. We found that the Joint Staff and the Air Force have identified requirements for joint proficiency, often calling on military members to develop complex combinations of knowledge,

² The completion of this report predates the establishment of the Department of the Air Force. In this report, *Air Force* refers only to the U.S. Air Force.

skills, abilities, and other characteristics over the courses of their careers. However, we could find no comprehensive set of attributes that is relevant to identifying joint potential.

In the absence of an existing set of attributes, the PAF team developed an exploratory approach to identify attributes that are related to joint potential, offering an initial attempt to identify attributes that will need further refinement through additional research. We began with requirements in Joint Staff and Air Force official documents (such as regulations and instructions) and, using a method we refer to as *deconstruction*, derived attributes from these requirements.

The method for deconstructing joint requirements comprises the following steps, shown in Figure 1.1:

Step 1. Identify official joint development guidance. We identified official joint and Air Force documents that describe the required characteristics of individuals working in a joint environment. We used the following list of documents in our analysis:

- Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 1800.01E, *Officer Professional Military Education Policy*, 2019
- CJCSI 1805.01B, *Enlisted Professional Military Education Policy*, 2015
- Joint Publication 1, *Doctrine for the Armed Forces of the United States*, 2017
- Joint Publication 3-0, *Joint Operations*, 2018
- Joint Staff J-7, *Joint Officer Handbook*, 2011
- Focus Area 2: Joint Warfighter, interview data summary
- *Strengthening Joint Leaders and Teams Flight Plan* (Saltzman and the Air Force Strategic Integration Group, 2018).

Step 2. Identify joint development requirements. From the guidance documents, we identified joint development requirements. These requirements were frequently broadly descriptive and did not identify specific attributes pertaining to individuals. This step resulted in 60 requirements. We then developed a way to identify attributes from these requirements, as explained in Steps 3 and 4.

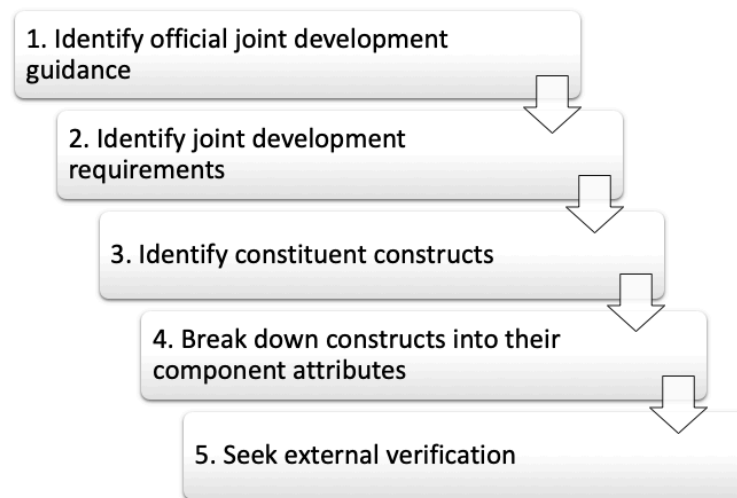
Step 3. Identify constituent constructs. After developing the list of joint development requirements, we parsed each requirement into discrete parts, which we refer to as *constituent constructs*—terms that together constitute a given joint development requirement. Where possible, we provide a literature-derived justification for the connections. When this was not possible because of gaps or inconsistencies in the literature, we used professional judgment to resolve inconsistencies and make connections that best reflected a military context. The deconstruction of all 60 requirements resulted in 26 constituent constructs. Appendix C contains the results of this step; the figures show all of the connections and their justifications (and citations, when available).

Step 4. Break down constructs into their component attributes. The fourth step involved parsing the 26 constituent constructs that resulted from Step 3 into the attributes that

pertain to a given construct. The goal of this step was to produce a complete list of relevant attributes that could be traced back to their source requirements. Attributes were treated as the foundational building blocks and, thus, were the end points of the deconstruction process. Appendix D contains the results of deconstructing the 26 constituent constructs into attributes.

Step 5. Seek external verification. We conducted two verification sessions to assess the degree to which this method resonated with select Air Force stakeholders.

Figure 1.1. Deconstructing Joint Requirements



Our deconstruction method resulted in a list of 22 attributes, which we define in Table 1.1.

Table 1.1. Final List of Attributes

Attribute	Definition
Agreeableness	“Tendency to act in a cooperative, unselfish manner” (American Psychological Association, undated); or “traits associated with [agreeableness] include being courteous, flexible, trusting, good-natured, cooperative, forgiving, soft-hearted, and tolerant” (Barrick and Mount, 1991, p. 4)
Altruism	Having an unselfish concern for others’ welfare, as shown in generosity, consideration of others, and a willingness to assist others in need of help (adapted from American Psychological Association, undated)
Assertiveness	Directly speaking up, even in situations in which one’s “positions and/or interests are, or could be, in conflict with others’ positions or interests” (Ames, 2009, p. 112)
Conscientiousness	“Conscientiousness reflects dependability; that is, being careful, thorough, responsible, organized, and planful” (Barrick and Mount, 1991, p. 4)
Creativity	“The ability to produce or develop original work, theories, techniques or thoughts” (American Psychological Association, undated)

Attribute	Definition
Empathy	“Understanding a person from his or her frame of reference rather than one’s own, or vicariously experiencing that person’s feelings, perceptions, and thoughts” (American Psychological Association, undated)
General mental ability ^a	Analogous to <i>intelligence</i> , <i>general mental ability</i> is “the ability to derive information, learn from experience, adapt to the environment, understand, and correctly utilize thought and reason” (American Psychological Association, undated)
Humility	“The quality of being humble, characterized by a low focus on the self, an accurate (not over- or underestimated) sense of one’s accomplishments and worth, and an acknowledgment of one’s limitations, imperfections, mistakes, [and] gaps in knowledge” (American Psychological Association, undated)
Integrity	“The quality of moral consistency, honesty, and truthfulness with oneself and others” (American Psychological Association, undated)
Intellectual risk-taking	The “impulse to find and try original ideas, to go beyond one’s familiar boundaries of knowledge and explore new possibilities rather than staying in the relative security of what [one already knows]. The risk is that the ideas will be deemed impractical, inappropriate, [or] crazy” (Byron, 2006, p. 2)
Motivation to learn	The impetus driving pursuit of mastery of a task or subject matter, driven by desire for learning rather than for demonstration of competency (adapted from Dweck, 1986)
Motivation to succeed	The “desire to prove one’s competence and to gain favorable judgments about it” and the desire to achieve a high level of performance (Vandewalle, 1997, p. 1000)
Numeracy	“The ability to understand and work with numbers” (Oxford English Dictionary, undated-e)
Openness to experience	The “tendency to be open to new aesthetic, cultural, or intellectual experiences” (American Psychological Association, undated)
Orderliness	The “tendency to be neat and tidy and to keep everything in place” (American Psychological Association, undated)
Physical fitness	The “ability to physically accomplish all aspects of the mission while remaining healthy and uninjured” (CJCSI 3405.01, 2013, p. A-1)
Self-awareness	<i>Self-awareness</i> is the extent to which people are consciously aware of their interactions or relationships with others and of their internal states (adapted from Trudeau and Reich, 1995)
Self-control	<i>Self-control</i> is “the capacity to regulate attention, emotion, and behavior in the presence of temptation” (Duckworth and Gross, 2014, p. 1). Self-control is especially focused on meeting “standards such as ideals, values, morals, and social expectations, and to support the pursuit of long-term goals” (Baumeister, Vohs, and Tice, 2007, p. 351)
Self-efficacy	“People’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” (Bandura, 1986, p. 391)
Spatial awareness	“The skill required to orient or perceive one’s body in space or to detect or reason about relationships within or between objects in space” (definition is for <i>spatial ability</i> in American Psychological Association, undated)
Tolerance for ambiguity	“The degree to which one is able to accept, and to function without distress or disorientation in, situations having conflicting or multiple interpretations or outcomes” (definition is for <i>ambiguity tolerance</i> in American Psychological Association, undated)

Attribute	Definition
Verbal expression	Analogous to the productive abilities (fluency) component of overall <i>verbal ability</i> , <i>verbal expression</i> is “demonstrated skill to . . . communicate effectively with words” (American Psychological Association, undated).

^a Although general mental ability can be considered a high-level construct, in literature (e.g., Straus et al., 2018), it is often treated as an attribute, albeit with a distinction between fluid (stable) and crystallized (malleable or developable) intelligence. See Table 5.2 in the main report and Appendix F in this report for more on general mental ability.

Evaluating the Attributes

We examined various dimensions of the attributes that could provide direction for the Air Force in identifying relevant attributes during recruiting processes and accession programs. The Air Force can use these dimensions to make judgments about the relevance of a given attribute to determine whether it can be developed and to consider whether investments in assessment tools or research would be useful. We selected the following five dimensions for this purpose:

1. *proximity of attributes to joint requirements in the deconstruction process*: This dimension indicates how prominently each attribute appeared in the deconstruction of each requirement.
2. *stability or malleability of the attributes*: This dimension is useful for making judgments about whether an attribute could or should be assessed during recruiting and accession or whether the attribute can be developed over the course of an airman’s career.
3. *current Air Force screening and assessment practices that could be applied to attributes*: This dimension examines whether an attribute is currently screened for or could be screened for during Air Force accession processes and limitations associated with doing so. This dimension focuses on four assessment methods: the Armed Services Vocational Aptitude Battery (ASVAB), Air Force Officer Qualifying Test (AFOQT), Tailored Adaptive Personality Assessment System (TAPAS), and Strength Deployment Inventory (SDI).
4. *other existing tools that could be used to assess attributes*: This dimension addresses other tools beyond those the Air Force is currently using that are available to screen for an attribute and the degree to which such tools have been validated.
5. *alignment of attributes with Air Force foundational competencies*: This dimension evaluates whether an attribute aligns with any of the 22 current Air Force foundational competencies.

Appendix E contains the results of our analysis of attribute proximity to joint requirements. Appendix F contains our assessment of all five dimensions for each of the 22 attributes.

Appendix C. Joint Requirements Deconstruction Results

This appendix provides the initial deconstruction for each of the 60 joint requirements identified in our analysis and listed in Table C.1. The figures in this appendix, together with those provided in Appendix D, allow one to trace the full deconstruction of each requirement. In this appendix, we show only the initial deconstruction of each requirement into its immediate component constructs and attributes. The table below each figure shows the definition (and/or context) for each requirement and the justification used in identifying each of its components.

To trace the full deconstruction of a requirement, one would begin with a requirement's initial deconstruction and then examine the subsequent deconstructions in Appendix D for each of its component constructs. For example, Figure C.1 shows the initial deconstruction of Desired Leader Attribute (DLA) 1 into the following three constituent constructs, each of which has its own figure in Appendix D:

- systems thinking (Figure D.21)
- understand organizational capacities, limitations, and goals (Figure D.25)
- understand the environment (Figure D.26).

If we look at Figure D.21, systems thinking then deconstructs into critical thinking, among other components. Because critical thinking is itself a construct, it is deconstructed in Figure D.7. This deconstruction process continues until all component constructs at all levels have been examined and the deconstructions end with a set of attributes. Additional details about the process used to deconstruct requirements can be found in Chapter 4 of the main report.

Although the full deconstruction of any given requirement could conceivably be displayed in a single figure rather than in individual parts, as in Appendixes C and D, these complete figures can become too large and complex to effectively be displayed on a single page. This limitation is evident in the example of the full deconstruction of Enlisted Desired Leader Attribute (EDLA) 1 shown in Figure 4.4 in the main report.

Figures depicting the initial deconstruction of each of the 60 joint requirements used in our analysis are provided in the remainder of this appendix. Details about how these joint requirements were identified can be found in Chapter 4 of the main report. The figures are organized by requirement source, beginning with the officer DLAs and EDLAs. These sources are followed by requirements from Joint Publication 1, Joint Publication 3-0, the *Strengthening Joint Leaders and Teams Gap Analysis*, the *Strengthening Joint Leaders and Teams Flight Plan*, and the *Joint Officer Handbook*. Within each source, the requirements are provided in alphabetical order or, in the case of the DLAs and EDLAs, in numeric order.

The elements used in the deconstructions shown in the figures are color-coded as follows:³ Blue boxes are for joint requirements, green boxes are for constituent constructs, and orange boxes are for attributes.

Table C.1. Joint Requirements Identified and Deconstructed

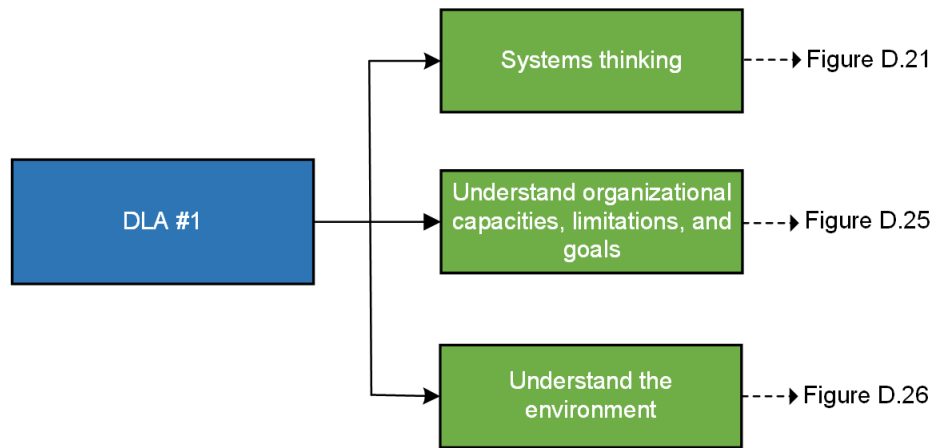
Source	Requirement	Corresponding Figure
DLA	1. Understand the security environment and instruments of national power	Figure C.1
	2. Anticipate and respond to uncertainty	Figure C.2
	3. Anticipate change and lead transitions	Figure C.3
	4. Operate through trust, empowerment, and understanding	Figure C.4
	5. Make ethical decisions	Figure C.5
	6. Think critically and strategically	Figure C.6
EDLA	1. Operate under mission command	Figure C.7
	2. Make ethical decisions	Figure C.8
	3. Strengthen the total force	Figure C.9
	4. Anticipate, communicate, and mitigate risks	Figure C.10
	5. Operate in joint environments	Figure C.11
	6. Think critically and develop leaders	Figure C.12
Joint Publication 1	Competence	Figure C.13
	Integrity	Figure C.14
	Moral courage	Figure C.15
	Physical courage	Figure C.16
	Courage	Figure C.17
Joint Publication 3-0	Capacity to consider contrary views	Figure C.18
	Ethical leadership	Figure C.19
	Intuition	Figure C.20
	Judgment	Figure C.21
	Situational awareness	Figure C.22
<i>Strengthening Joint Leaders and Teams Gap Analysis</i>	Adaptive leadership	Figure C.23
	Credibility in joint context	Figure C.24
	Joint forces integration	Figure C.25
	Joint planning experience and processes	Figure C.26
	Knowledge of Air Force capabilities and doctrine	Figure C.27
	Knowledge of command relationships	Figure C.28
	Knowledge of joint culture	Figure C.29

³ See Chapter 4 of the main report for definitions of the terms represented by each color.

Source	Requirement	Corresponding Figure
	Knowledge of sister-service capabilities and doctrine	Figure C.30
	Motivation to succeed in joint environments	Figure C.31
	Operational artistry	Figure C.32
	Teamwork	Figure C.33
<i>Strengthening Joint Leaders and Teams Flight Plan</i>	Battle management skills	Figure C.34
	Educated	Figure C.35
	Execute rapid decisionmaking in any type of conflict	Figure C.36
	Joint planning skills	Figure C.37
	Overall motivation	Figure C.38
	Solution-minded	Figure C.39
	Trained	Figure C.40
	Understand how to optimize joint capabilities across domains	Figure C.41
	Understand service and interagency cultures	Figure C.42
	Understand sister-service doctrine	Figure C.43
	Understanding of the land domain	Figure C.44
	Visualize multiple battlespaces	Figure C.45
Joint Officer Handbook	Build constructive work relationships	Figure C.46
	Communicate effectively at executive levels and with diverse workforce	Figure C.47
	Effectively manage and lead diverse workforce	Figure C.48
	Effectively prepare, plan, and participate in joint exercises	Figure C.49
	Exhibit excellent time-management skills	Figure C.50
	Exhibit joint and command-level mindset	Figure C.51
	Knowledge of Air Force organization and capabilities	Figure C.52
	Knowledge of combatant command authorities and legal requirements	Figure C.53
	Knowledge of non-U.S. Department of Defense (DoD) agencies and their relationships with combatant commands	Figure C.54
	Maximize technology software and hardware capabilities	Figure C.55
	Practice lifelong learning behaviors	Figure C.56
	Problem-solving using strategic and critical thinking	Figure C.57
	Understand and excel in Joint Staff officer roles	Figure C.58
	Understand organization and missions of combatant commands	Figure C.59
	Write, read, and conduct advanced-level research	Figure C.60

SOURCES: Joint Publication 1, 2017; Joint Publication 3-0, 2018; Saltzman and the Air Force Strategic Integration Group, 2018; Joint Staff J-7, 2011.

Figure C.1. Desired Leader Attribute 1: Understand the Security Environment and Instruments of National Power

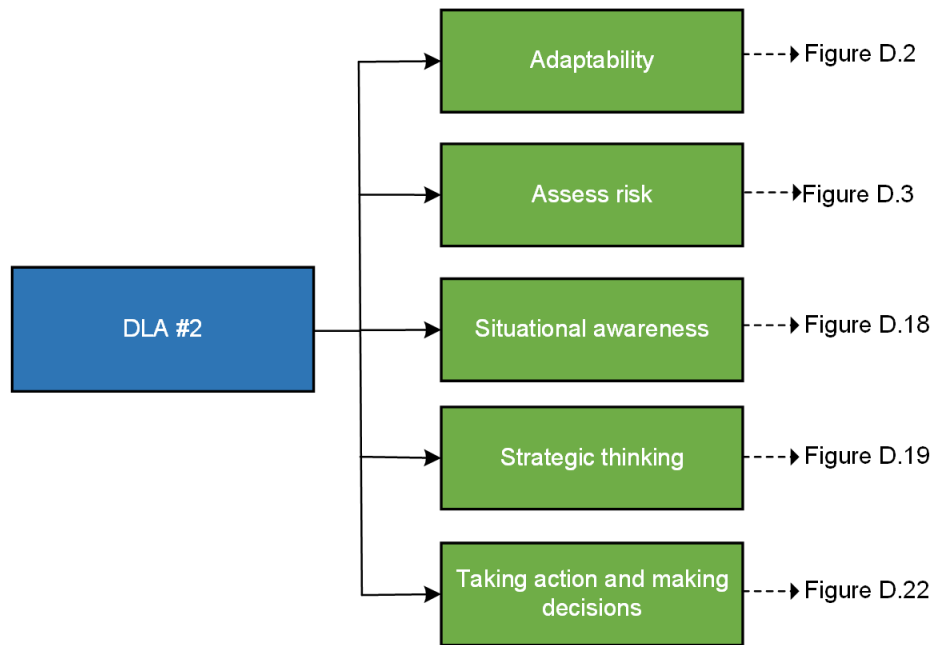


Definition and/or Context

DLA 1: “Understand the security environment and the contributions of all instruments of national power” (CJCSI 1800.01E, 2019, p. A-2)

Component	Type	Justification and/or Source
Systems thinking	Construct	Contributes to systematic understanding of national capabilities and the global security environment
Understand organizational capacities, limitations, and goals	Construct	Inherent to requirement; for more on understanding the contributions of all “instruments of national power to achieve national strategic objectives,” see Joint Publication 1, 2017, p. xi.
Understand the environment	Construct	Inherent to requirement; for more on understanding the strategic security environment, see Joint Publication 1, 2017, p. xi.

Figure C.2. Desired Leader Attribute 2: Anticipate and Respond to Uncertainty

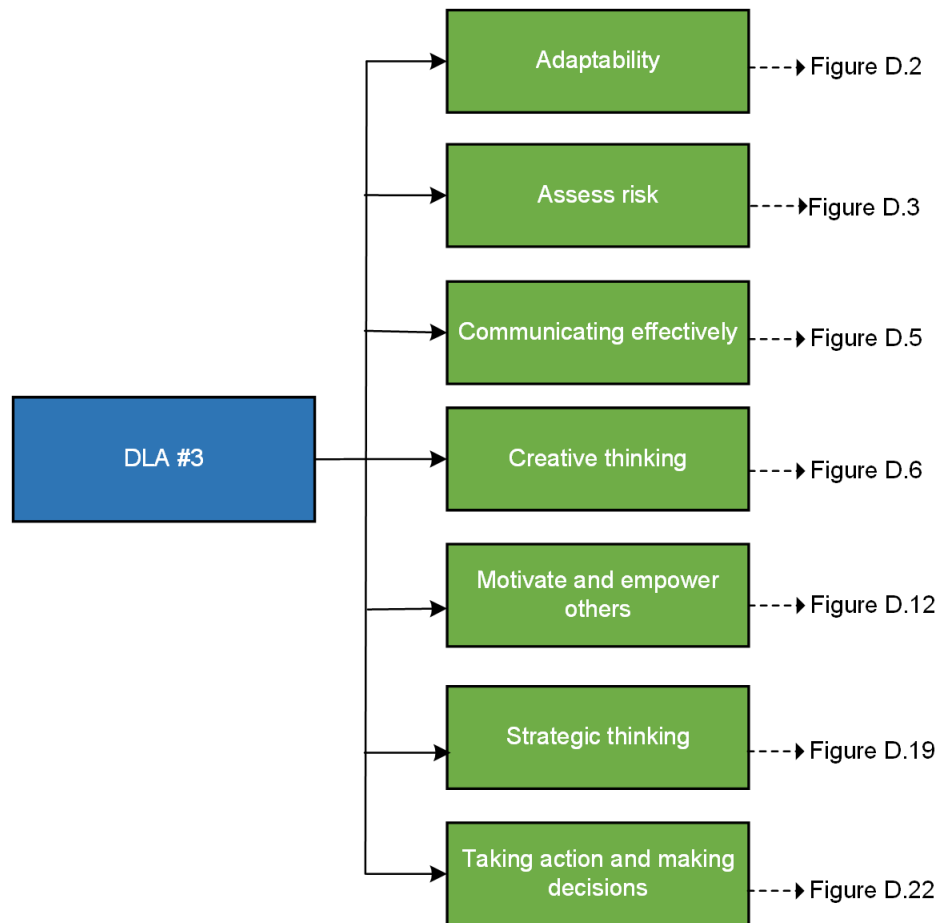


Definition and/or Context

DLA 2: Anticipate and “respond to surprise and uncertainty” (CJCSI 1800.01E, 2019, p. A-3)

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to effectively operate in uncertain environments and respond to surprise
Assess risk	Construct	Contributes to the ability to anticipate surprise in uncertain environments
Situational awareness	Construct	Contributes to the ability to anticipate surprise in uncertain environments
Strategic thinking	Construct	Contributes to the ability to develop an effective course of action in situations of uncertainty and in response to surprise
Taking action and making decisions	Construct	Contributes to the ability to effectively take action in response to surprise

Figure C.3. Desired Leader Attribute 3: Anticipate Change and Lead Transitions

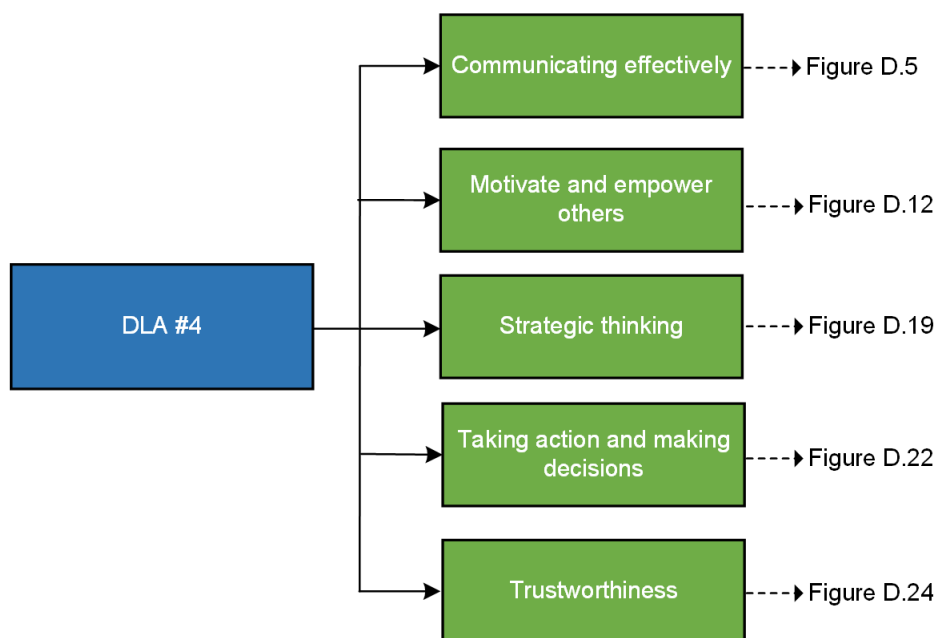


Definition and/or Context

DLA 3: “Anticipate and recognize change and lead transitions” (CJCSI 1800.01E, 2015, p. A-3)

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to effectively operate in changing environments and during periods of organizational change
Assess risk	Construct	Contributes to the ability to anticipate change in uncertain environments and understand risks during periods of transition
Communicating effectively	Construct	Contributes to effectively communicating the vision for organizational change and the path to making that change (Li et al., 2017, p. 68; Yukl and Lepsinger, 2006, p. 6)
Creative thinking	Construct	Contributes to anticipating change and generating innovative ideas for how to manage change and lead transitions (Yukl, Gordon, and Taber, 2002, p. 16)
Motivate and empower others	Construct	Contributes to effective leadership, including during periods of organizational change (Gilley, McMillan, and Gilley, 2009, p. 43)
Strategic thinking	Construct	Contributes to the ability to develop an effective course of action in the face of organizational change
Taking action and making decisions	Construct	Contributes to the ability to effectively take action and make decisions during periods of organizational change

Figure C.4. Desired Leader Attribute 4: Operate Through Trust, Empowerment, and Understanding



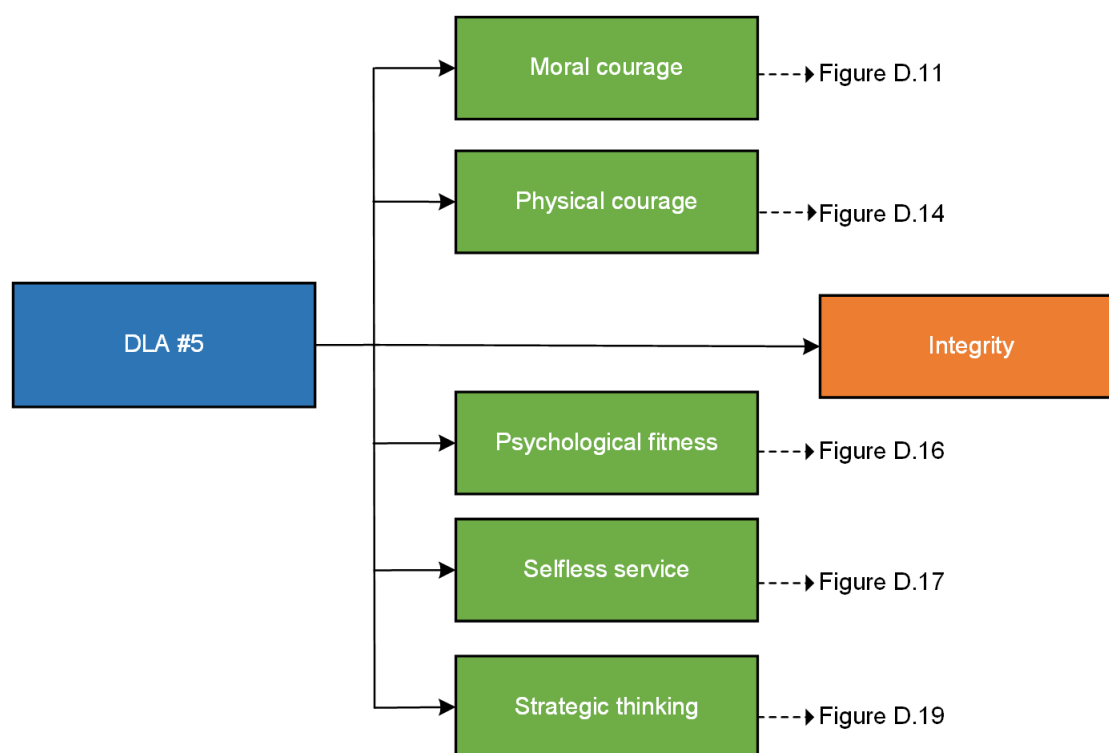
Definition and/or Context

DLA 4: “Operate on intent through trust, empowerment, and understanding (the essentials of Mission Command)” (CJCSI 1800.01E, 2015, p. A-3)

“Mission command is the conduct of military operations through decentralized execution based upon mission-type orders” (Joint Publication 1, 2017, p. V-15).

Component	Type	Justification and/or Source
Communicating effectively	Construct	Contributes to communicating and interpreting commander’s intent (Joint Publication 1, 2017, p. V-15)
Motivate and empower others	Construct	Inherent to requirement (Joint Publication 1, 2017, p. V-15)
Strategic thinking	Construct	Contributes to the ability to develop mission objectives or to develop an effective course of action to achieve mission objectives (Joint Publication 1, 2017, p. V-15)
Taking action and making decisions	Construct	Contributes to the ability to set effective mission objectives or to take action to achieve mission objectives (Joint Publication 1, 2017, p. V-15)
Trustworthiness	Construct	Inherent to requirement (Joint Publication 1, 2017, p. V-15)

Figure C.5. Desired Leader Attribute 5: Make Ethical Decisions



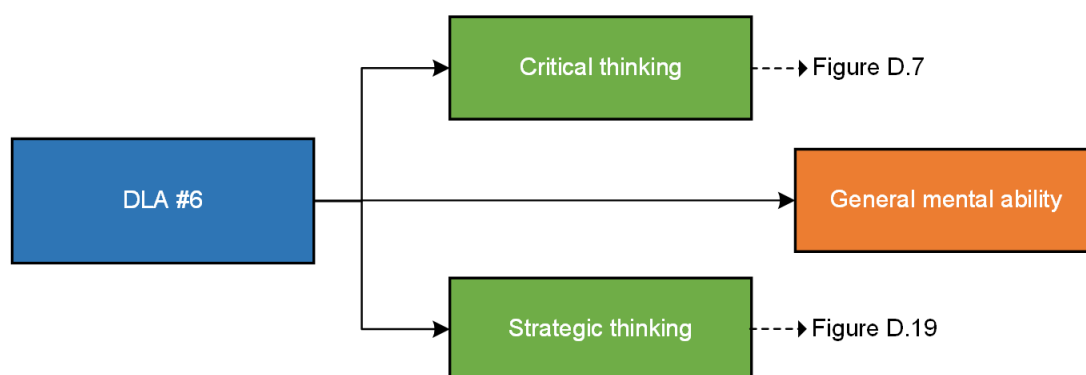
Definition and/or Context

DLA 5: “Make ethical decisions based on the shared values of the profession of arms” (CJCSI 1800.01E, 2015, p. A-3)

“U.S. military service is based on values that U.S. military experience has proven to be vital for operational success. These values adhere to the most idealistic societal norms, are common to all the Services, and represent the essence of military professionalism. Integrity, competence, physical courage, moral courage, and teamwork all have special impact on the conduct of joint operations. . . . Duty, honor, courage, integrity, and selfless service are the calling cards of the profession of arms” (Joint Publication 1, 2017, pp. B-1–B-2).

Component	Type	Justification and/or Source
Moral courage	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Physical courage	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to make ethical decisions, even in situations of potentially extreme stress
Selfless service	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Strategic thinking	Construct	Contributes to the ability to understand the ethical consequences of potential courses of action when making decisions
Integrity	Attribute	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)

Figure C.6. Desired Leader Attribute 6: Think Critically and Strategically

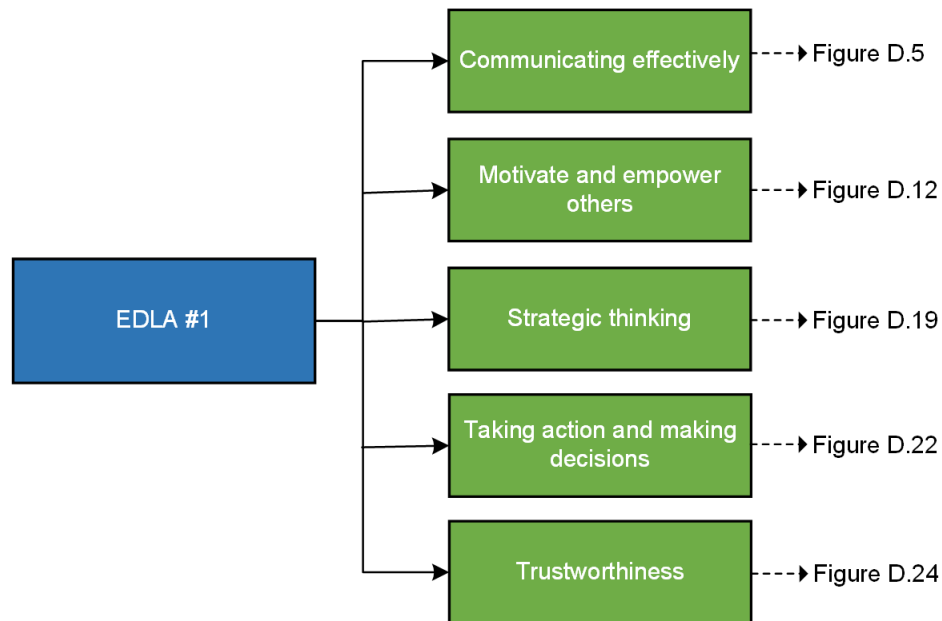


Definition and/or Context

DLA 6: “Think critically and strategically in applying joint warfighting principles and concepts of joint operations” (CJCSI 1800.01E, 2015, p. A-3)

Component	Type	Justification and/or Source
Critical thinking	Construct	Inherent to the requirement
Strategic thinking	Construct	Inherent to the requirement
General mental ability	Attribute	Contributes to the quality of thinking

Figure C.7. Enlisted Desired Leader Attribute 1: Operate Under Mission Command

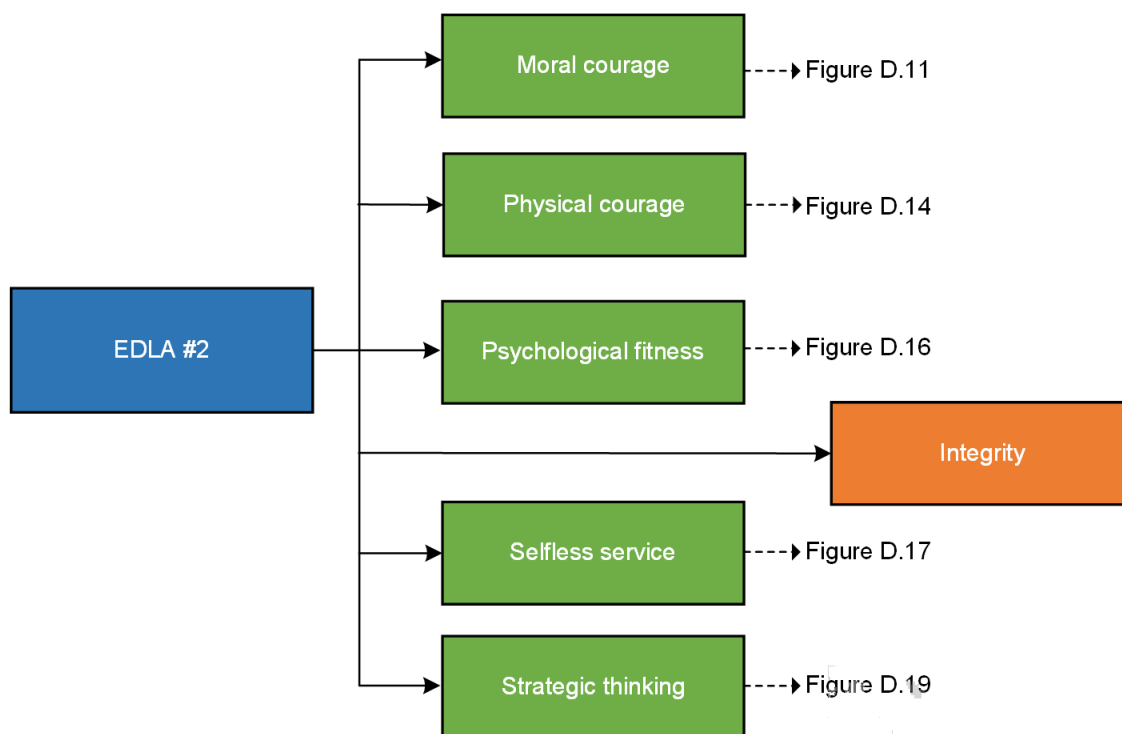


Definition and/or Context

EDLA 1: “The ability to operate on commander’s intent and enable mission command at all levels” (CJCSI 1805.01B, 2015, p. A-1)

Component	Type	Justification and/or Source
Communicating effectively	Construct	Contributes to communicating and interpreting commander’s intent (Joint Publication 1, 2017, p. V-15)
Motivate and empower others	Construct	Inherent to the requirement (Joint Publication 1, 2017, p. V-15)
Strategic thinking	Construct	Contributes to the ability to develop an effective course of action to achieve mission objectives (Joint Publication 1, 2017, p. V-15)
Taking action and making decisions	Construct	Contributes to the ability to make decisions and take action to achieve mission objectives (Joint Publication 1, 2017, p. V-15)
Trustworthiness	Construct	Inherent to the requirement (Joint Publication 1, 2017, p. V-15)

Figure C.8. Enlisted Desired Leader Attribute 2: Make Ethical Decisions



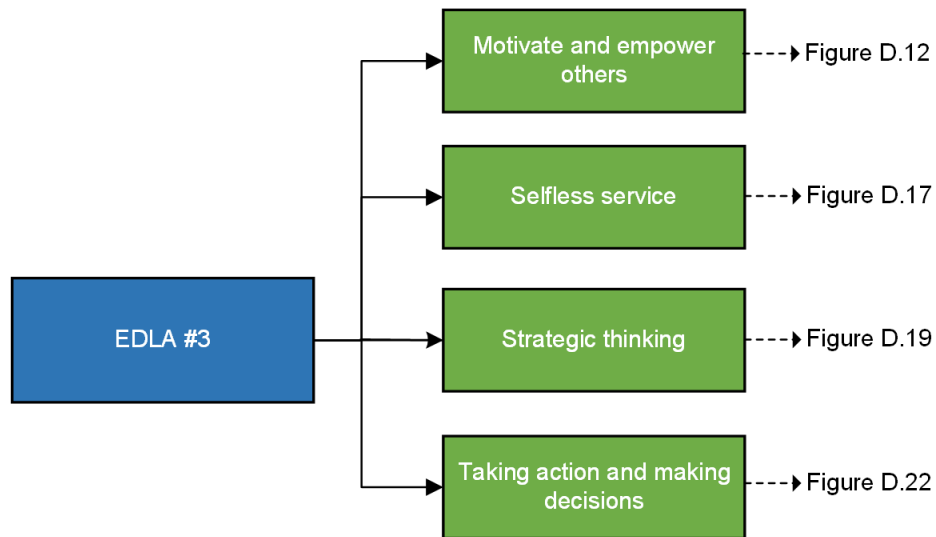
Definition and/or Context

EDLA 2: “The ability to make sound ethical decisions based on the values and standards of the profession of arms” (CJCSI 1805.01B, 2015, p. A-1)

“U.S. military service is based on values that U.S. military experience has proven to be vital for operational success. These values adhere to the most idealistic societal norms, are common to all the Services, and represent the essence of military professionalism. Integrity, competence, physical courage, moral courage, and teamwork all have special impact on the conduct of joint operations. . . . Duty, honor, courage, integrity, and selfless service are the calling cards of the profession of arms” (Joint Publication 1, 2017, pp. B-1–B-2).

Component	Type	Justification and/or Source
Moral courage	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Physical courage	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to make ethical decisions, even in situations of potentially extreme stress
Selfless service	Construct	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)
Strategic thinking	Construct	Contributes to the ability to understand the ethical consequences of potential courses of action when making decisions
Integrity	Attribute	Inherent to the requirement as one of the shared values of the profession of arms (Joint Publication 1, 2017, pp. B-1–B-2)

Figure C.9. Enlisted Desired Leader Attribute 3: Strengthen the Total Force

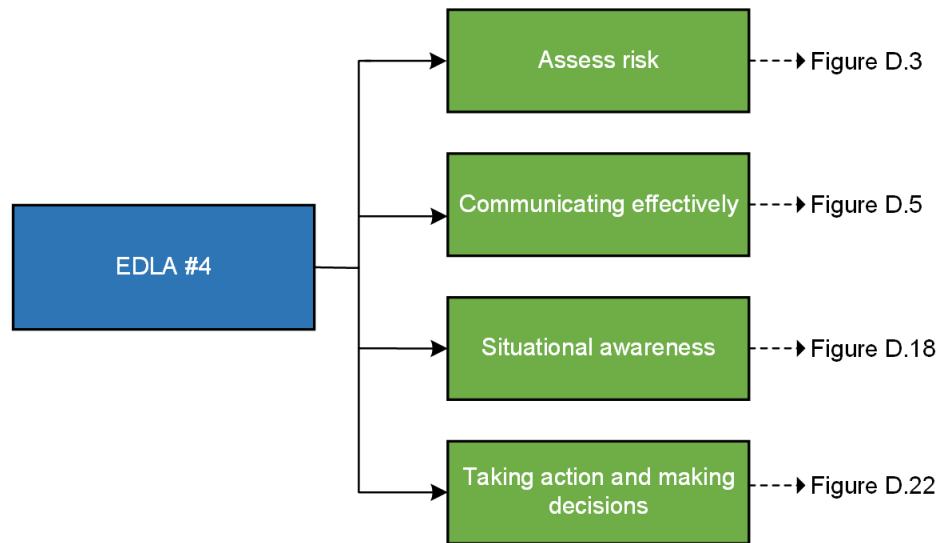


Definition and/or Context

EDLA 3: “The ability to utilize available resources to enhance the discipline, readiness, resiliency, and health of the total force” (CJCSI 1805.01B, 2015, p. A-1)

Component	Type	Justification and/or Source
Motivate and empower others	Construct	Contributes to leading, empowering, and imparting positive values—including discipline, readiness, resiliency, and health—to others in the total force
Selfless service	Construct	Contributes to personal commitment to the total force
Strategic thinking	Construct	Contributes to the ability to consider how to best use available resources to support the total force
Taking action and making decisions	Construct	Contributes to the ability to make resource-utilization decisions and to take action to support the total force

Figure C.10. Enlisted Desired Leader Attribute 4: Anticipate, Communicate, and Mitigate Risks

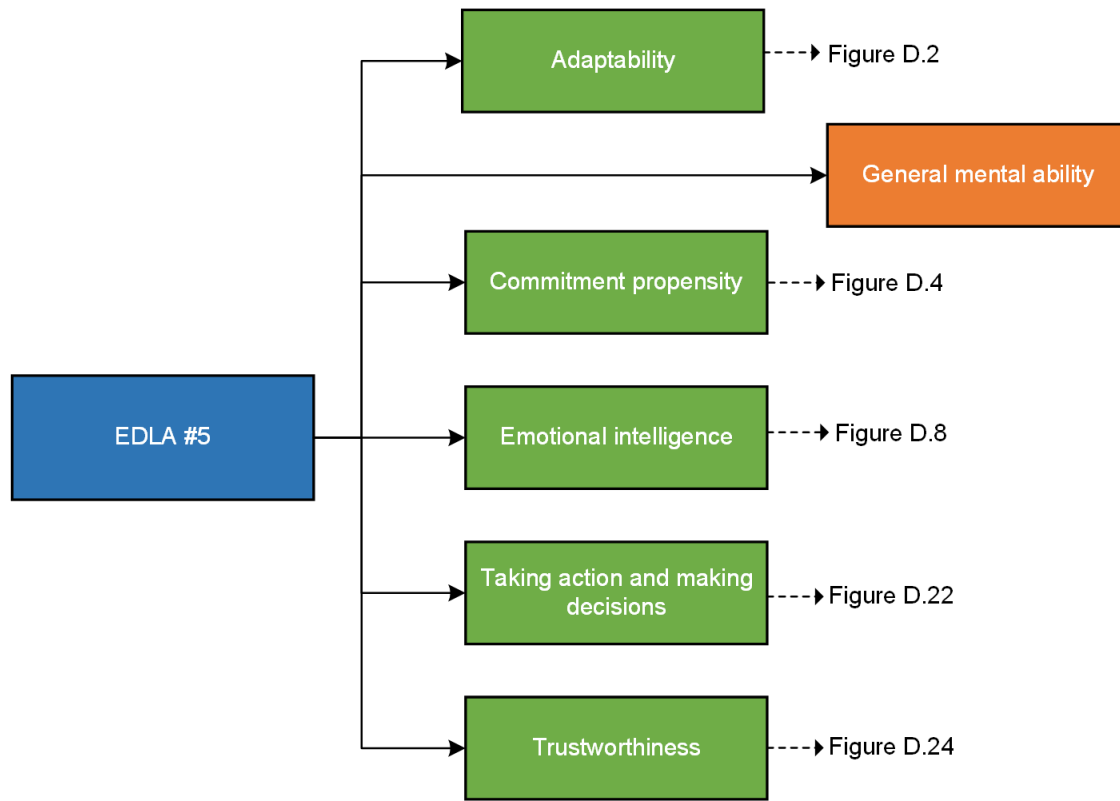


Definition and/or Context

EDLA 4: “The ability to anticipate, communicate, and mitigate risks” (CJCSI 1805.01B, 2015, p. A-1)

Component	Type	Justification and/or Source
Assess risk	Construct	Inherent to the requirement
Communicating effectively	Construct	Inherent to the requirement
Situational awareness	Construct	Contributes to the ability to recognize and detect changes in the risk environment
Taking action and making decisions	Construct	Contributes to the ability to make decisions and take action to mitigate risks

Figure C.11. Enlisted Desired Leader Attribute 5: Operate in Joint Environments

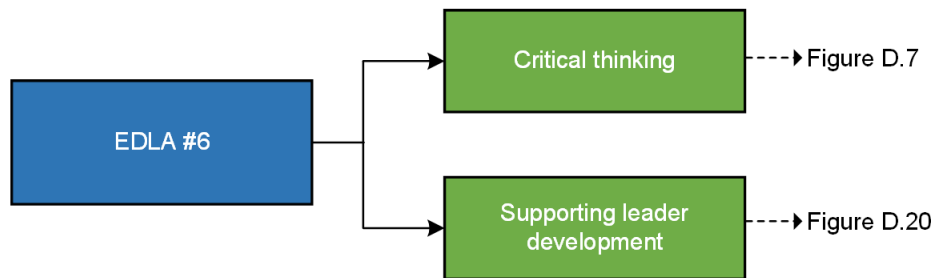


Definition and/or Context

EDLA 5: "The ability to operate in joint, interagency, intergovernmental, and multinational environments" (CJCSI 1805.01B, 2015, p. A-1).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to operate in unfamiliar environments
Commitment propensity	Construct	Contributes to personal commitment to service in joint, interagency, intergovernmental, and multinational environments
Emotional intelligence	Construct	Contributes to the ability to understand others' emotions, perspectives, and goals, along with the dynamics of social situations "Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments" (Markel et al., 2011, p. xv).
Taking action and making decisions	Construct	Contributes to the ability to make decisions and take action as part of operating in unfamiliar environments
Trustworthiness	Construct	Contributes to being perceived positively by colleagues
General mental ability	Attribute	Contributes to quality of work

Figure C.12. Enlisted Desired Leader Attribute 6: Think Critically and Develop Leaders

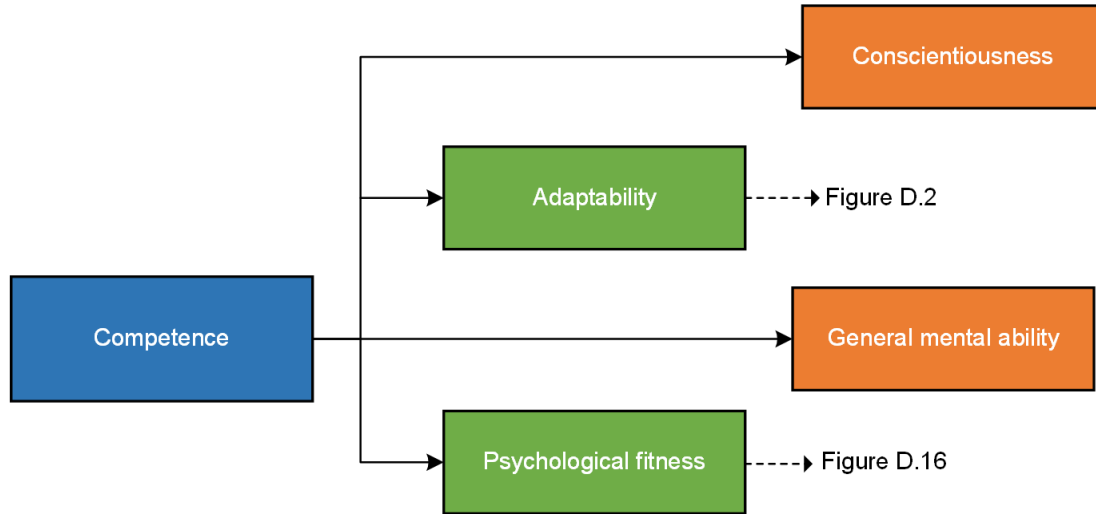


Definition and/or Context

EDLA 6: “The ability to think critically and develop agile and adaptive leaders” (CJCSI 1805.01B, 2015, p. A-1)

Component	Type	Justification and/or Source
Critical thinking	Construct	Inherent to the requirement
Supporting leader development	Construct	Inherent to the requirement

Figure C.13. Joint Publication 1: Competence

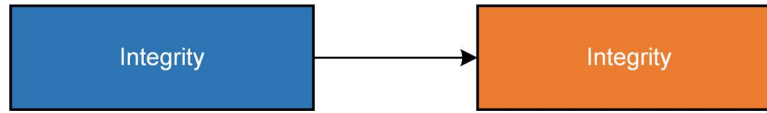


Definition and/or Context

“Competence is central to the profession of arms. Competent performance includes both the technical competence to perform the relevant task to standard as well as the ability to integrate that skill with others” (Joint Publication 1, 2017, p. B-1).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging environments
Psychological fitness	Construct	Contributes to the ability to succeed in different and potentially challenging environments
Conscientiousness	Attribute	Contributes to quality of work
General mental ability	Attribute	Contributes to quality of work

Figure C.14. Joint Publication 1: Integrity

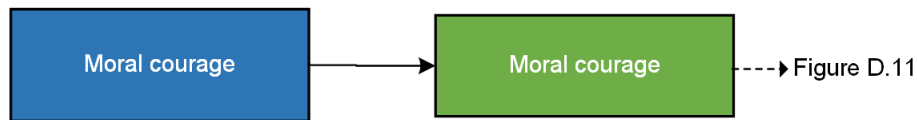


Definition and/or Context

“Integrity is the quality of being honest and having strong moral principles” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Integrity	Attribute	Identical to the requirement

Figure C.15. Joint Publication 1: Moral Courage



Definition and/or Context

“Moral courage is the ability to act rightly in the face of popular opposition, or discouragement. This includes the willingness to stand up for what one believes to be right even if that stand is unpopular or contrary to conventional wisdom. This involves risk taking, tenacity, and accountability” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Moral courage	Construct	Identical to the requirement

Figure C.16. Joint Publication 1: Physical Courage

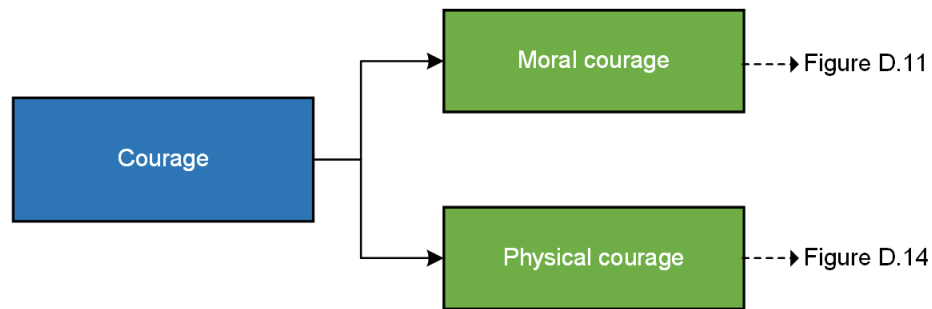


Definition and/or Context

“Physical courage has throughout history defined warriors. It is the ability to confront physical pain, hardship, death, or threat of death” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Physical courage	Construct	Identical to the requirement

Figure C.17. Joint Publication 1: Courage

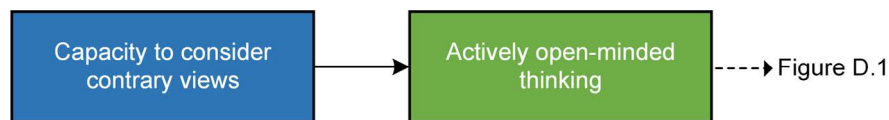


Definition and/or Context

“Courage has both physical and moral aspects and encompasses both bravery and fortitude” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Moral courage	Construct	Inherent to the requirement
Physical courage	Construct	Inherent to the requirement

Figure C.18. Joint Publication 3-0: Capacity to Consider Contrary Views

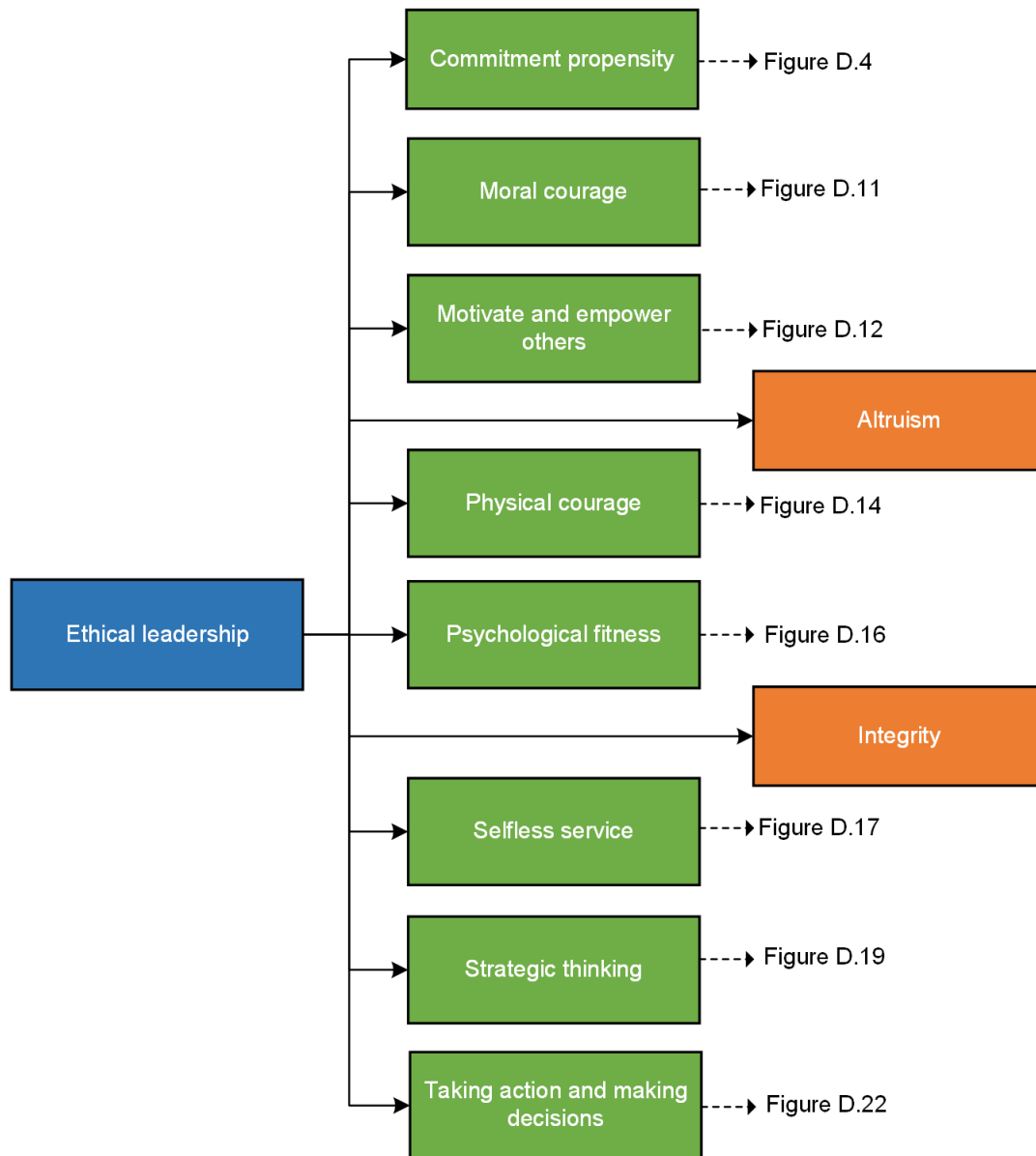


Definition and/or Context

“The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations” (Joint Publication 3-0, 2018, p. II-1).

Component	Type	Justification and/or Source
Actively open-minded thinking	Construct	Actively open-minded thinkers seek and are receptive to criticism and other points of view. They update their beliefs when confronted with new evidence, even if it conflicts with their prior ideas (Tetlock and Gardner, 2015, pp. 126, 191).

Figure C.19. Joint Publication 3-0: Ethical Leadership



Definition and/or Context

"The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations" (Joint Publication 3-0, 2018, p. II-1).

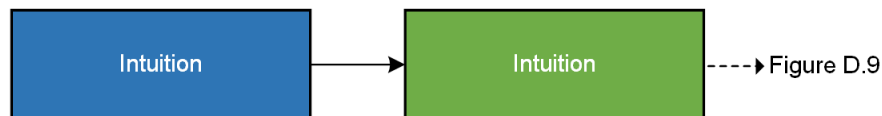
Component	Type	Justification and/or Source
Commitment propensity	Construct	Contributes to the personal commitment to acting rightly on behalf of the joint force
Moral courage	Construct	Contributes to acting ethically as a commander, even in the face of opposition
Motivate and empower others	Construct	Contributes to a commander's ability to instill ethical values in others
Physical courage	Construct	Contributes to acting ethically as a commander, even in the face of physical danger

Definition and/or Context

“The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations” (Joint Publication 3-0, 2018, p. II-1).

Component	Type	Justification and/or Source
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to make ethical decisions, even in situations of potentially extreme stress
Selfless service	Construct	Contributes to personal commitment to others and to the joint force
Strategic thinking	Construct	Contributes to the ability to understand the ethical consequences of potential courses of action when making decisions as a commander
Taking action and making decisions	Construct	Contributes to the ability to act rightly and make ethical decisions as a commander
Altruism	Attribute	Contributes to personal commitment to acting rightly on behalf of others
Integrity	Attribute	Contributes to personal commitment to acting rightly in accordance with moral principles

Figure C.20. Joint Publication 3-0: Intuition



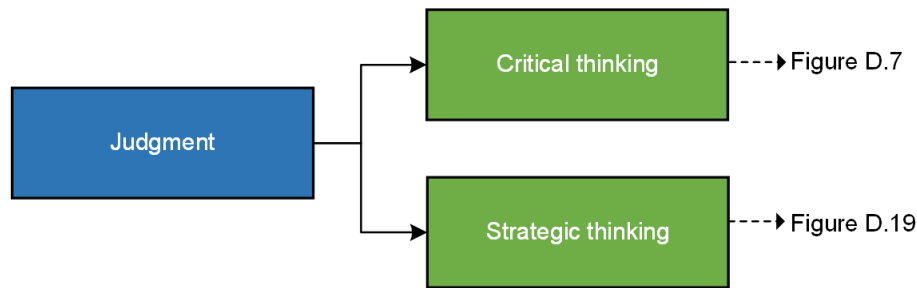
Definition and/or Context

“The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations” (Joint Publication 3-0, 2018, p. II-1).

Intuition is “the ability to understand something instinctively, without the need for conscious reasoning” (Oxford English Dictionary, undated-c).

Component	Type	Justification and/or Source
Intuition	Construct	Identical to the requirement

Figure C.21. Joint Publication 3-0: Judgment



Definition and/or Context

“The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations” (Joint Publication 3-0, 2018, p. II-1).

Judgment is “the process of forming an opinion or evaluation by discerning and comparing” (Merriam-Webster, undated-a).

Component	Type	Justification and/or Source
Critical thinking	Construct	Contributes to the ability to deliberately weigh different information, opinions, and sources in the act of forming a judgment
Strategic thinking	Construct	Contributes to the ability to deliberately think through a problem and potential courses of action in the act of forming a judgment

Figure C.22. Joint Publication 3-0: Situational Awareness



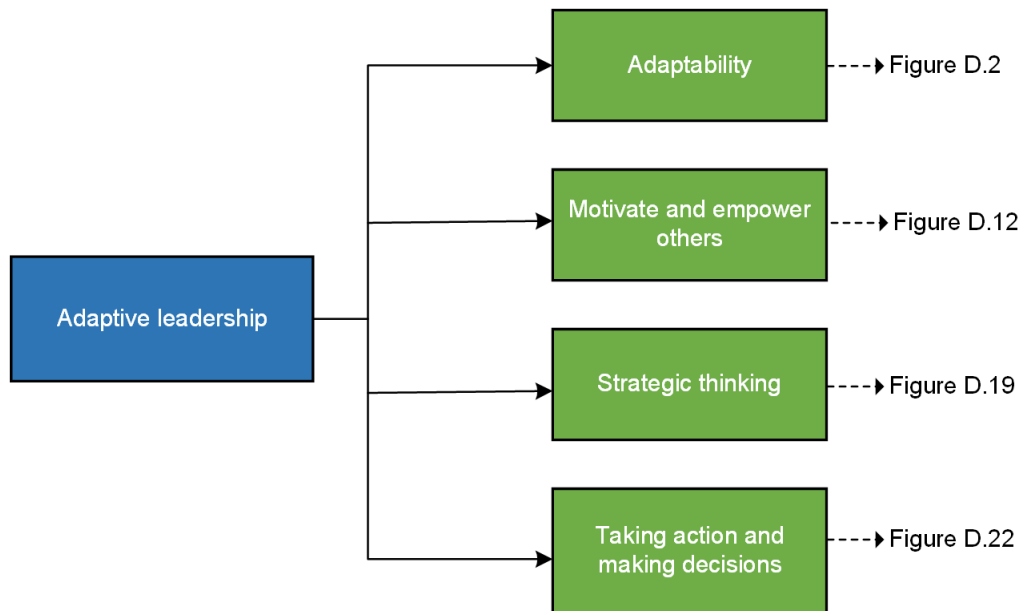
Definition and/or Context

“The combination of courage, ethical leadership, judgment, intuition, situational awareness, and the capacity to consider contrary views helps commanders make insightful decisions in complex situations” (Joint Publication 3-0, 2018, p. II-1).

Situational awareness is “the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future” (quoted in Endsley, 1995, p. 36).

Component	Type	Justification and/or Source
Situational awareness	Construct	Identical to the requirement

Figure C.23. Strengthening Joint Leaders and Teams Gap Analysis: Adaptive Leadership

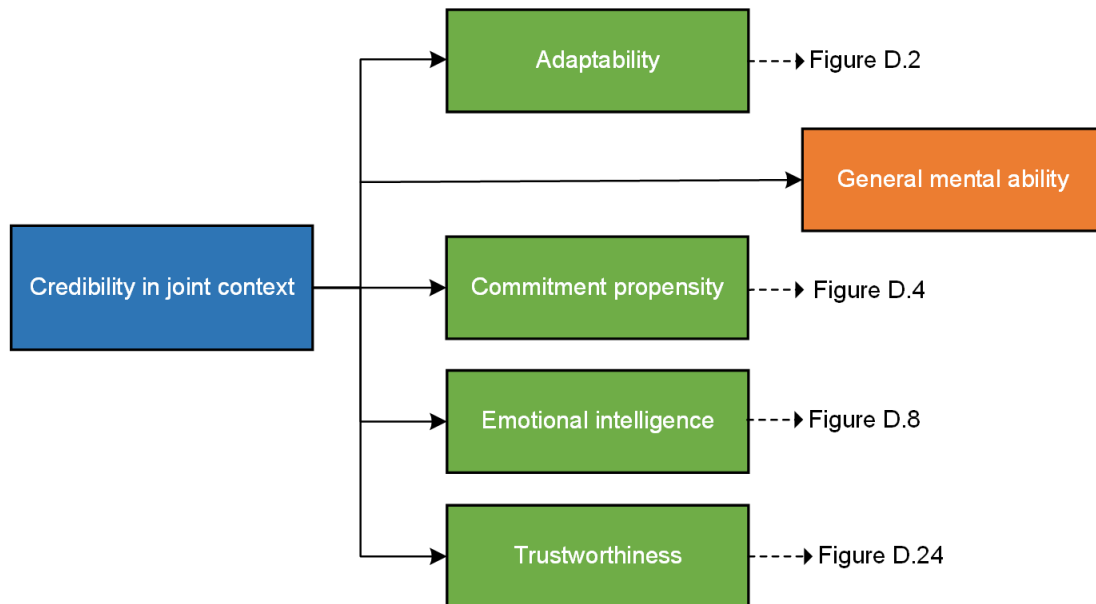


Definition and/or Context

“Adaptive Leadership is a key skill Airmen need to be effective Joint Warfighters. Due to the unique makeup and size of a Joint staff, Airmen need to be proficient in various leadership styles. . . . Airmen must be able to adapt to various personalities and cultural customs that they may not be accustomed to” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
Adaptability	Construct	Inherent to the requirement
Motivate and empower others	Construct	Contributes to effective leadership
Strategic thinking	Construct	Contributes to effective leadership
Taking action and making decisions	Construct	Contributes to effective leadership

Figure C.24. Strengthening Joint Leaders and Teams Gap Analysis: Credibility in Joint Context

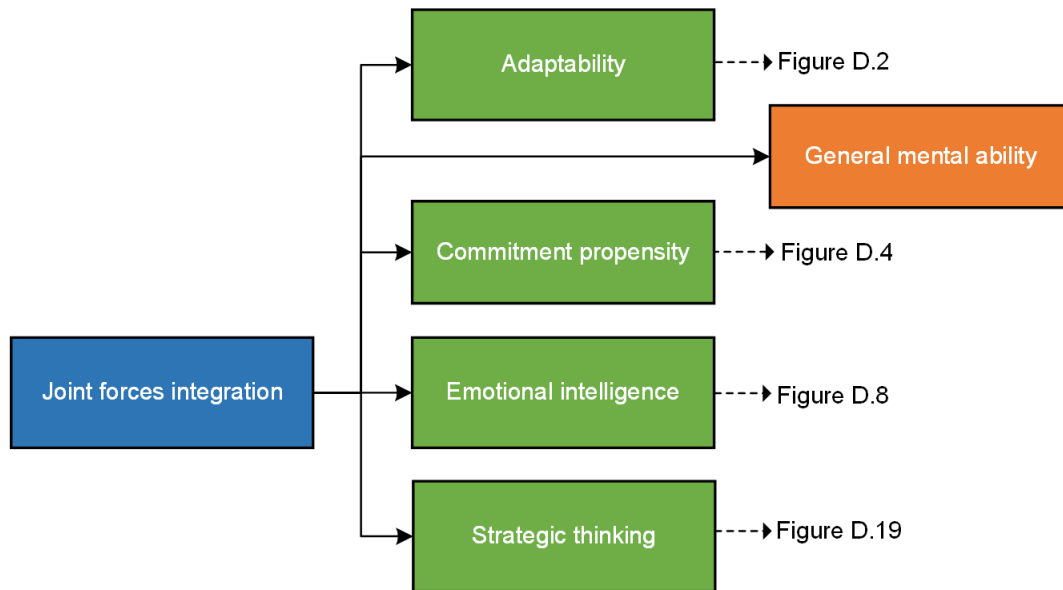


Definition and/or Context

“Credibility and competency are clearly linked. Credibility is a byproduct of joint competency and an Airman’s reputation is directly linked to their establishment of trust and confidence in their job performance from both their joint superiors and peers” (Department of the Air Force, undated, p. 3).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Commitment propensity	Construct	Contributes to personal commitment to ensure organizational success in different and potentially challenging joint environments
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
		“Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments” (Markel et al., 2011, p. xv).
Trustworthiness	Construct	Contributes to being perceived positively by colleagues
General mental ability	Attribute	Contributes to quality of work and demonstration of competency

Figure C.25. Strengthening Joint Leaders and Teams Gap Analysis: Joint Forces Integration

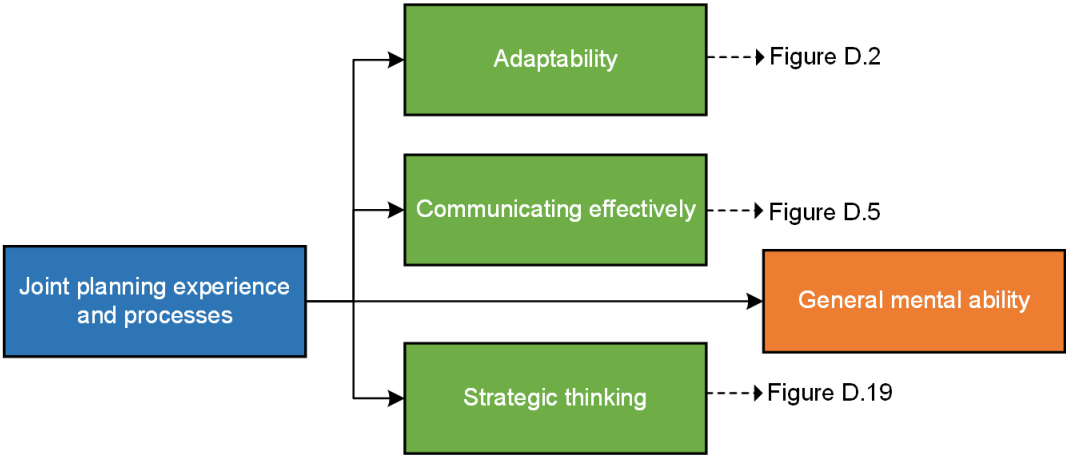


Definition and/or Context

“For Airmen to effectively influence Joint Operations, Airmen must be able to Integrate [Air Force] capabilities at their disposal into . . . the joint mission to meet the Commander’s Intent. Additionally, members must possess the skill to integrate other (service’s) capabilities in order to influence the operation. Again, many of those interviewed noted the complexity of joint operations and the need to eliminate any type of service parochialism when it’s applied to the mission. A joint warfighter considers all available courses of action and needs to have a working knowledge of all available capabilities” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Commitment propensity	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
Strategic thinking	Construct	“Interpersonal skills and other integration skills tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments” (Markel et al., 2011, p. xv). Contributes to the ability to consider all available capabilities and courses of action during joint forces integration efforts
General mental ability	Attribute	Contributes to the ability to consider all available capabilities and courses of action during joint forces integration efforts

Figure C.26. Strengthening Joint Leaders and Teams Gap Analysis: Joint Planning Experience and Processes

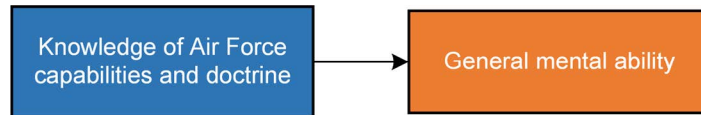


Definition and/or Context

“A key difference identified between Airmen and other service members was the lack of planning experience and a lack of knowing how to plan on a joint level utilizing the [Joint Operation Planning Process] or the [Military Decision Making Process]” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments and using different planning processes
Communicating effectively	Construct	Contributes to the ability to communicate with others as part of joint planning processes
Strategic thinking	Construct	Contributes to the ability to consider potential courses of action and their consequences as part of joint planning
General mental ability	Attribute	Contributes to the ability to learn, understand, and carry out joint planning processes

Figure C.27. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Air Force Capabilities and Doctrine

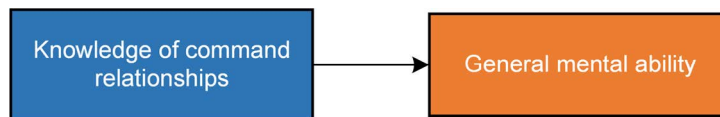


Definition and/or Context

“Interview subjects identified that an advanced level of Air Force capabilities and doctrine is the foundational knowledge that is needed to be an effective Joint Warfighter. . . . [This knowledge includes] a requirement to understand how the Air Force can contribute to the mission and mission objectives specifically” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand Air Force capabilities and doctrine

Figure C.28. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Command Relationships

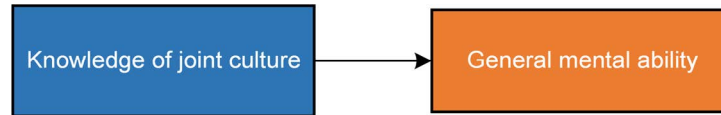


Definition and/or Context

“[Knowledge of] command relationships was identified as vital knowledge members wish they had known prior to their Joint assignments” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand command relationships

Figure C.29. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Joint Culture

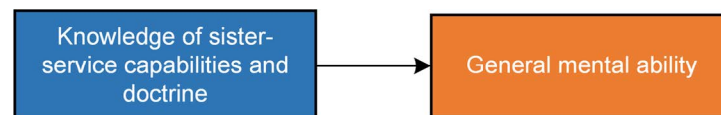


Definition and/or Context

“Joint Culture was identified as the last common knowledge topic desired to be an effective Joint Warfighter. Airmen need to be exposed with a baseline understanding of the lexicon and culture of the Joint world prior to their assignment” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand joint culture

Figure C.30. Strengthening Joint Leaders and Teams Gap Analysis: Knowledge of Sister-Service Capabilities and Doctrine

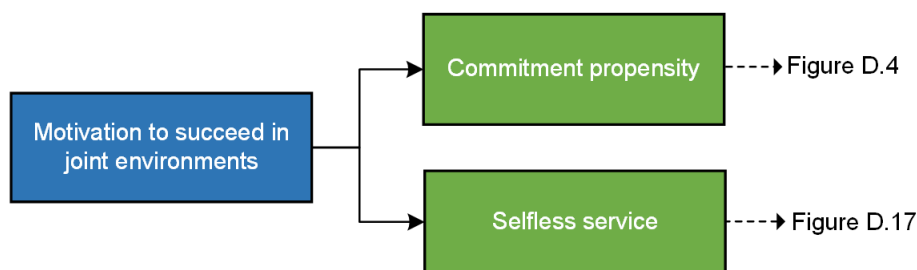


Definition and/or Context

“In addition to Air Force capabilities, Airmen must improve their knowledge of sister-service capabilities and Doctrine. [Knowledge of] basic sister-service capabilities and how they fit into the Joint world is desired so the Joint Airmen can confidently and correctly influence operations” (Department of the Air Force, undated, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand sister-service capabilities and doctrine

Figure C.31. Strengthening Joint Leaders and Teams Gap Analysis: Motivation to Succeed in Joint Environments

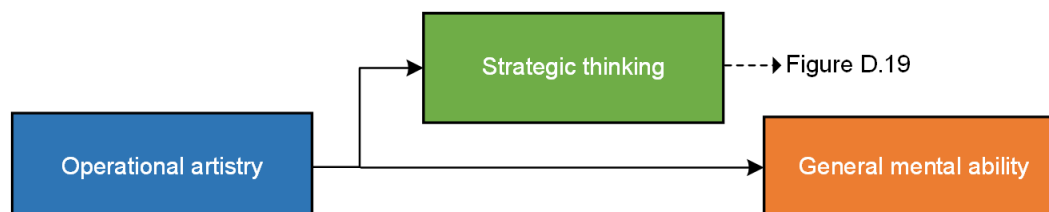


Definition and/or Context

"An Airmen's Motivation is extremely important as determined by interviewees. Airmen who do not have internal motivation to succeed or that do not have the desire to operate in a Joint world will not be effective in their duties" (Department of the Air Force, undated, p. 3).

Component	Type	Justification and/or Source
Commitment propensity	Construct	Contributes to personal commitment to joint organizations
Selfless service	Construct	Contributes to personal commitment to others and to the joint mission

Figure C.32. Strengthening Joint Leaders and Teams Gap Analysis: Operational Artistry

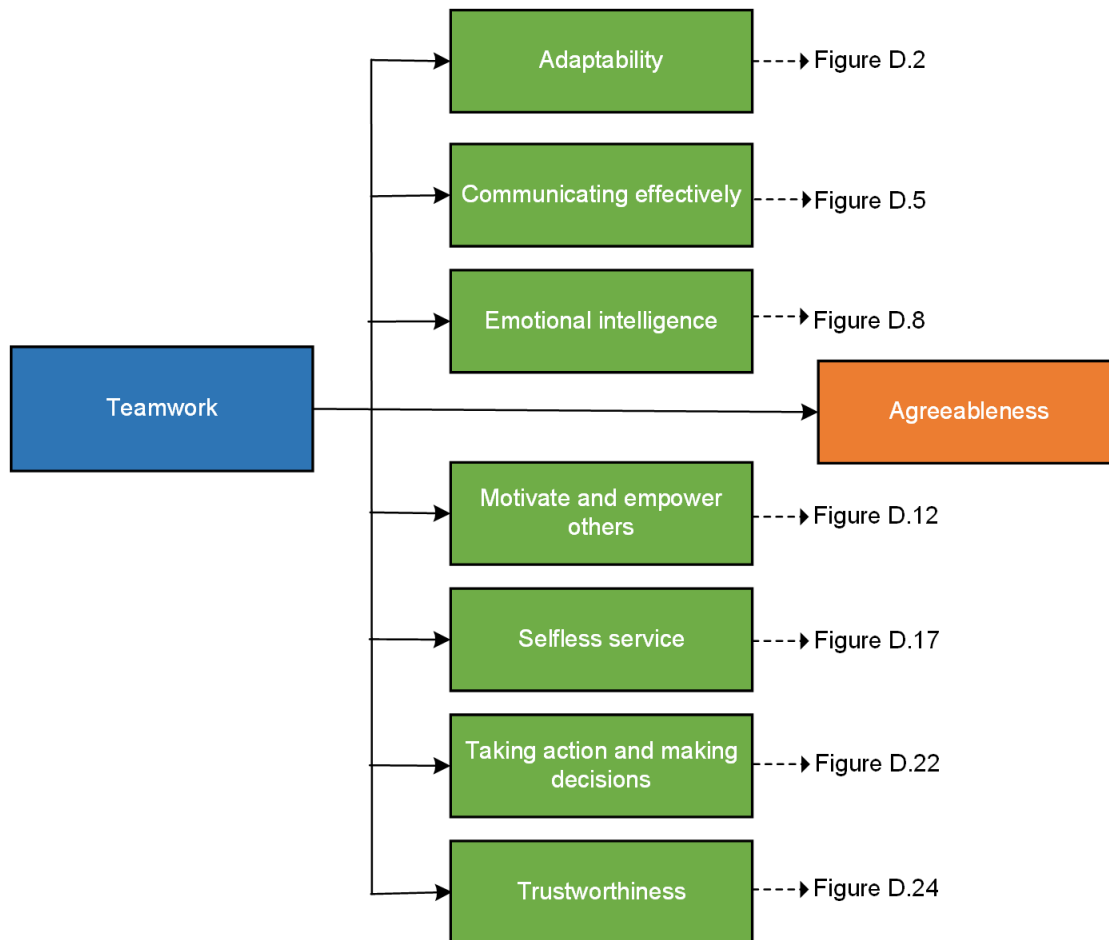


Definition and/or Context

"Operational artistry is a key attribute needed to be an effective Joint Warfighter. This attribute relates to the ability to link tactical actions both horizontally and then vertically to broader strategic context and intent. . . . Operational artistry is understanding how the various elements of a campaign or military operation nest together to accomplish a desired end state" (Department of the Air Force, undated, p. 3).

Component	Type	Justification and/or Source
Strategic thinking	Construct	Contributes to the ability to link tactical actions to broader strategic context
General mental ability	Attribute	Contributes to the ability to learn about, understand, and carry out operational artistry

Figure C.33. Strengthening Joint Leaders and Teams Gap Analysis: Teamwork



Definition and/or Context

“Teamwork is vital on a Joint team. Teamwork is the overarching attribute that encompasses numerous other interpersonal skills that are required when working with a diverse team. Airmen who are not able to effectively work on a team or adapt to diverse individuals and leaders will not be successful as Joint Warfighters. Airmen must convey value for their teammate’s experiences and expertise while effectively communicating their own. They must be able to show empathy and understanding to other priorities, burdens, and requirements that might not coincide with their worldview” (Department of the Air Force, undated, p. 3).

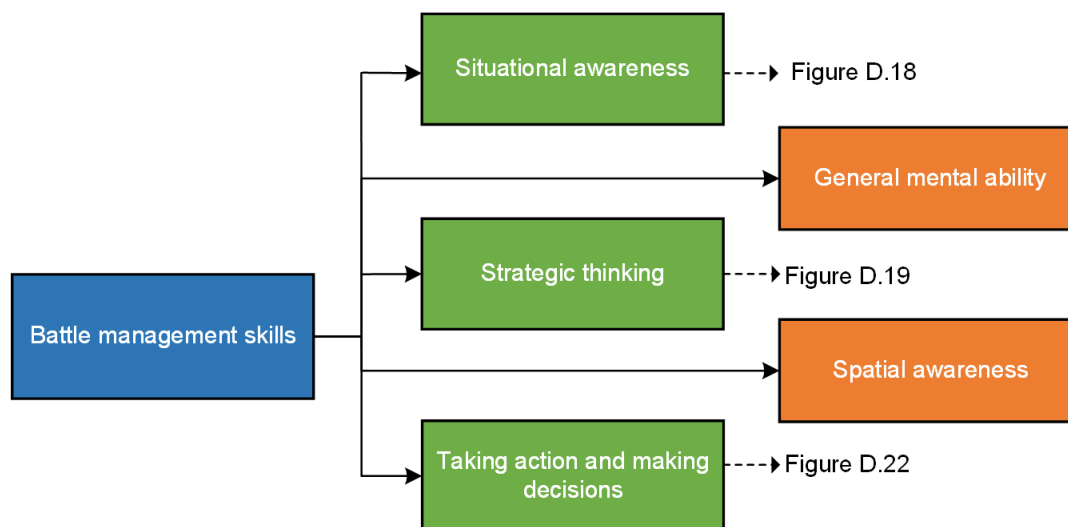
Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to adapt to working with diverse teams
Communicating effectively	Construct	Contributes to the ability to communicate effectively as a team member
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
Motivate and empower others	Construct	Contributes to the ability to lead and empower others as part of a team
Selfless service	Construct	Contributes to personal commitment to others and to team objectives
Taking action and making decisions	Construct	Contributes to the ability to make decisions and take action as part of a team

Definition and/or Context

“Teamwork is vital on a Joint team. Teamwork is the overarching attribute that encompasses numerous other interpersonal skills that are required when working with a diverse team. Airmen who are not able to effectively work on a team or adapt to diverse individuals and leaders will not be successful as Joint Warfighters. Airmen must convey value for their teammate’s experiences and expertise while effectively communicating their own. They must be able to show empathy and understanding to other priorities, burdens, and requirements that might not coincide with their worldview” (Department of the Air Force, undated, p. 3).

Component	Type	Justification and/or Source
Trustworthiness	Construct	Contributes to being perceived as reliable, competent, and supportive by colleagues
Agreeableness	Attribute	Contributes to being perceived positively by colleagues in team environments (Barrick and Mount, 1991, p. 4)

Figure C.34. Strengthening Joint Leaders and Teams Flight Plan: Battle Management Skills



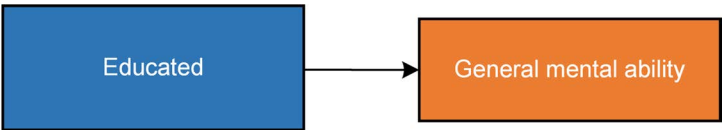
Definition and/or Context

“We must continue to develop and empower Airmen at all levels with the skills for joint planning, battle management, and a better understanding of how to optimize joint capabilities across multiple domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 14).

Battle management is “the management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority” (DoD, 2018, p. 27).

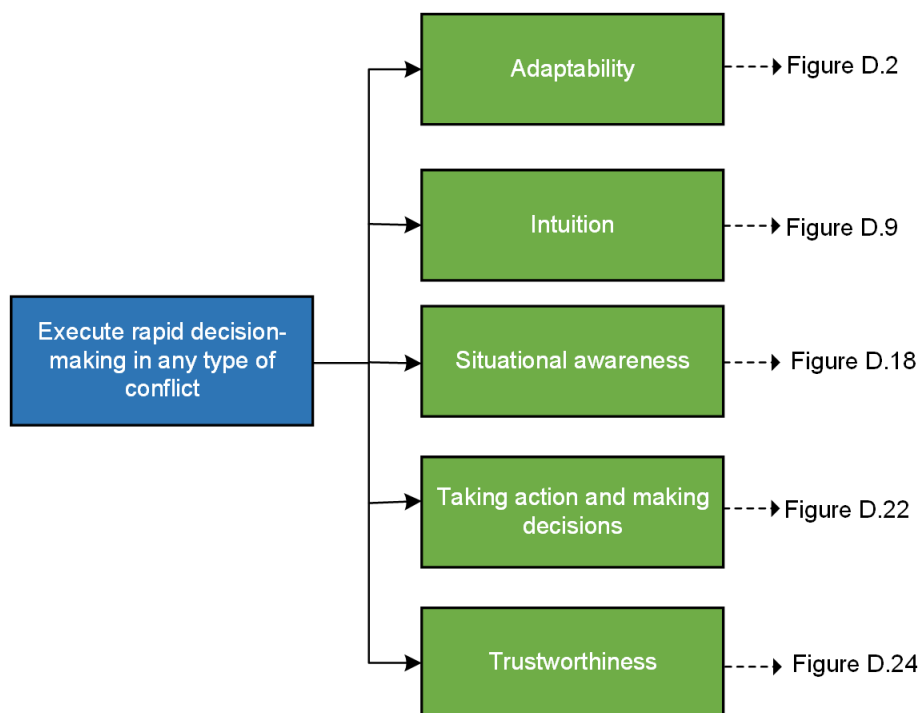
Component	Type	Justification and/or Source
Situational awareness	Construct	Contributes to understanding the battlefield
Strategic thinking	Construct	Contributes to understanding the battlefield and how to achieve mission goals within it
Taking action and making decisions	Construct	Contributes to achieving mission goals within the battlefield
General mental ability	Attribute	Contributes to understanding the battlefield
Spatial awareness	Attribute	Contributes to understanding the battlefield

Figure C.35. Strengthening Joint Leaders and Teams Flight Plan: Educated



Definition and/or Context		
“Joint Airmen–Solution-minded, trained, and educated Airmen organized and ready to integrate, influence, and lead planning, operations, and campaigns across all services, agencies, coalitions, and domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 145)		
Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to ability to learn

Figure C.36. Strengthening Joint Leaders and Teams Flight Plan: Execute Rapid Decisionmaking in Any Type of Conflict

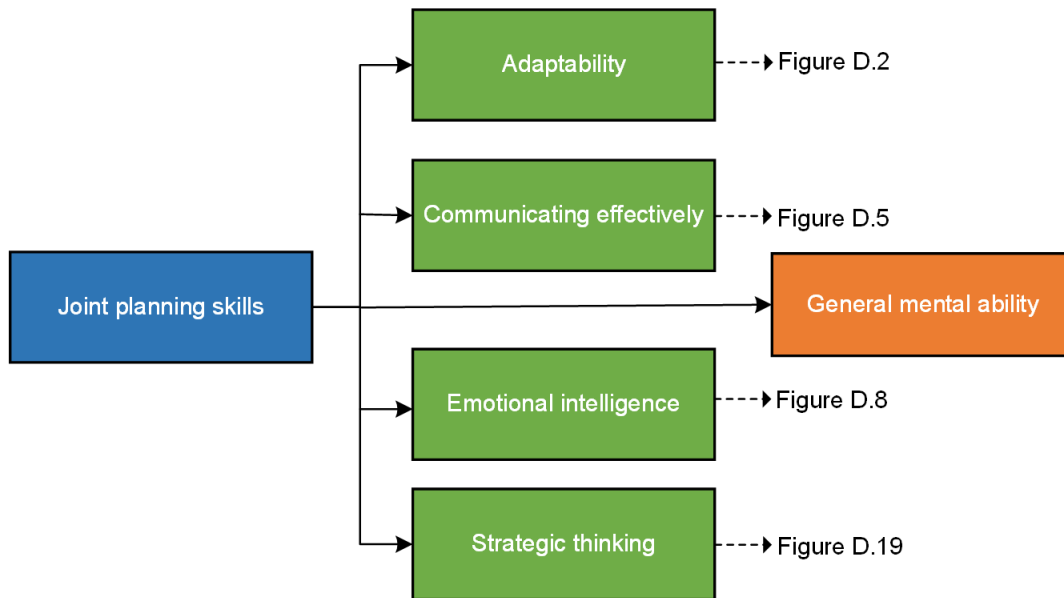


Definition and/or Context

"We need both leaders and tools that can visualize multiple battlespaces and execute rapid decision making in any type of conflict" (Saltzman and the Air Force Strategic Integration Group, 2018, p. 14).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to adapt to uncertain and fast-changing circumstances in any type of conflict
Intuition	Construct	Contributes to the ability to immediately understand conflict dynamics without the need for deliberate and time-consuming thought processes
Situational awareness	Construct	Contributes to understanding the battlefield environment
Taking action and making decisions	Construct	Contributes to the ability to make and execute rapid decisions
Trustworthiness	Construct	Contributes to others implicitly trusting and following one's lead when one is making and executing rapid decisions

Figure C.37. Strengthening Joint Leaders and Teams Flight Plan: Joint Planning Skills

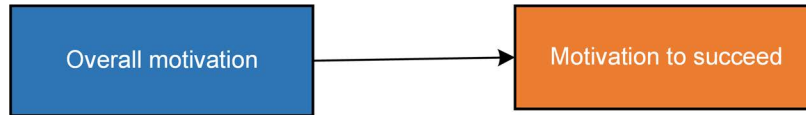


Definition and/or Context

“We must continue to develop and empower Airmen at all levels with the skills for joint planning, battle management, and a better understanding of how to optimize joint capabilities across multiple domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 14).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Communicating effectively	Construct	Contributes to the ability to communicate with others as part of joint planning
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
Strategic thinking	Construct	“Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments, in which success usually requires voluntary collaboration between independent organizations that are frequently pursuing different agendas” (Markel et al., 2011, p. xv). Contributes to the ability to consider potential courses of action and their consequences as part of joint planning
General mental ability	Attribute	Contributes to the ability to learn, understand, and carry out joint planning

Figure C.38. Strengthening Joint Leaders and Teams Flight Plan: Overall Motivation

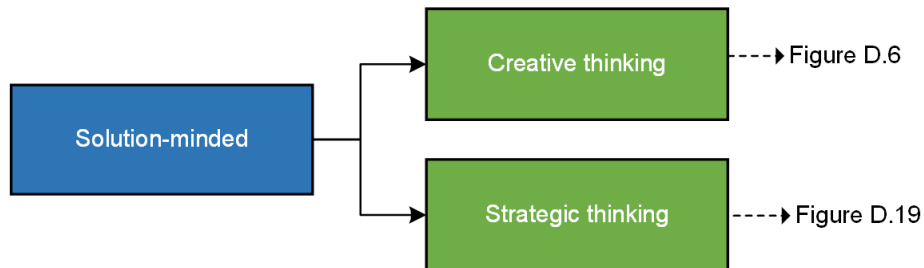


Definition and/or Context

Motivation is “desired and/or required to be successful as a joint warfighter” (Saltzman and the Air Force Strategic Integration Group, 2018, pp. 45–46).

Component	Type	Justification and/or Source
Motivation to succeed	Attribute	Inherent to the requirement

Figure C.39. Strengthening Joint Leaders and Teams Flight Plan: Solution-Minded

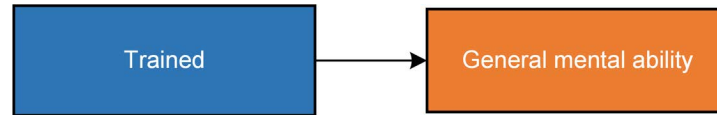


Definition and/or Context

“Joint Airmen—Solution-minded, trained, and educated Airmen organized and ready to integrate, influence, and lead planning, operations, and campaigns across all services, agencies, coalitions, and domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 145)

Component	Type	Justification and/or Source
Creative thinking	Construct	Contributes to the ability to generate creative solutions to problems
Strategic thinking	Construct	Contributes to the ability to think through how to use available resources and capabilities to solve problems and achieve goals

Figure C.40. Strengthening Joint Leaders and Teams Flight Plan: Trained

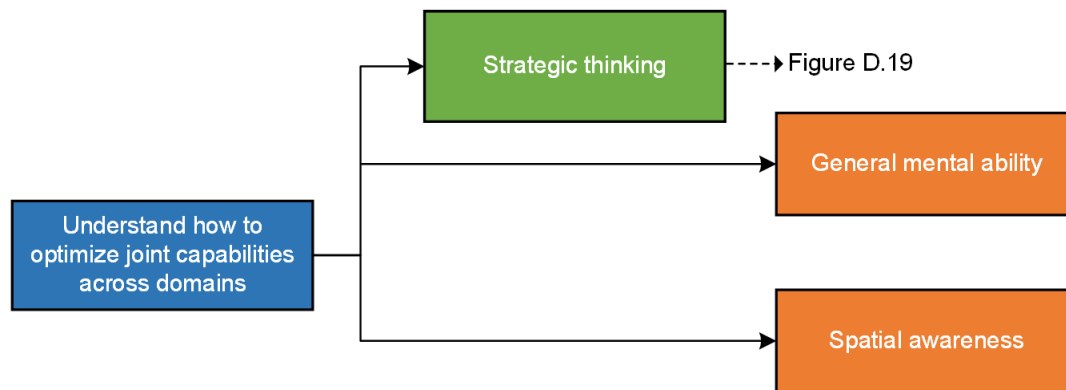


Definition and/or Context

“Joint Airmen—Solution-minded, trained, and educated Airmen organized and ready to integrate, influence, and lead planning, operations, and campaigns across all services, agencies, coalitions, and domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 145)

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn

Figure C.41. Strengthening Joint Leaders and Teams Flight Plan: Understand How to Optimize Joint Capabilities Across Domains

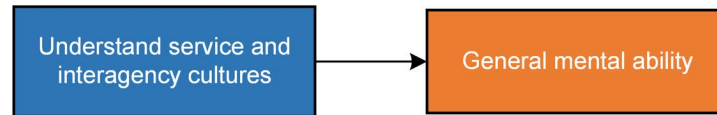


Definition and/or Context

“We must continue to develop and empower Airmen at all levels with the skills for joint planning, battle management, and a better understanding of how to optimize joint capabilities across multiple domains” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 14).

Component	Type	Justification and/or Source
Strategic thinking	Construct	Contributes to the ability to think through how to use joint capabilities to achieve objectives across multiple domains
General mental ability	Attribute	Contributes to the ability to learn, understand, and think through optimization of joint capabilities across multiple domains
Spatial awareness	Attribute	Contributes to the ability to understand the battlefield environment and the spatial relationships between multiple domains

Figure C.42. Strengthening Joint Leaders and Teams Flight Plan: Understand Service and Interagency Cultures

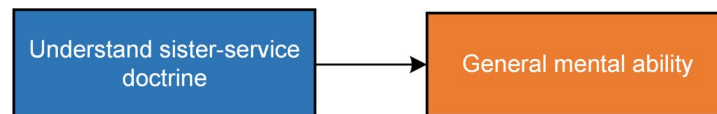


Definition and/or Context

Air Force institutional competencies should “account for various service and agency cultures so our future joint leaders can more effectively communicate with our partners” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 40).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand service and interagency cultures

Figure C.43. Strengthening Joint Leaders and Teams Flight Plan: Understand Sister-Service Doctrine

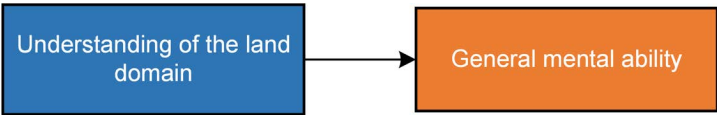


Definition and/or Context

Air Force institutional competencies should “account for joint doctrine and the potential disconnects with other services’ doctrine so our future joint leaders can anticipate and avoid coordination problems” (Saltzman and the Air Force Strategic Integration Group, 2018, pp. 40–41).

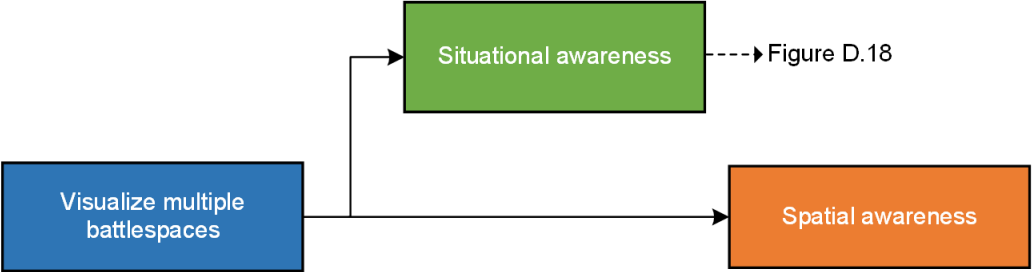
Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand sister-service doctrine

Figure C.44. Strengthening Joint Leaders and Teams Flight Plan: Understanding of the Land Domain



Definition and/or Context		
Air Force institutional competencies should “account for improved Airman competency in the land domain—to adeptly arbitrate warfighting choices (e.g., key terrain, population control, civil services, reestablishment of order) for this common Joint Task Force focus area of responsibility” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 41).		
Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand the land domain

Figure C.45. Strengthening Joint Leaders and Teams Flight Plan: Visualize Multiple Battlespaces

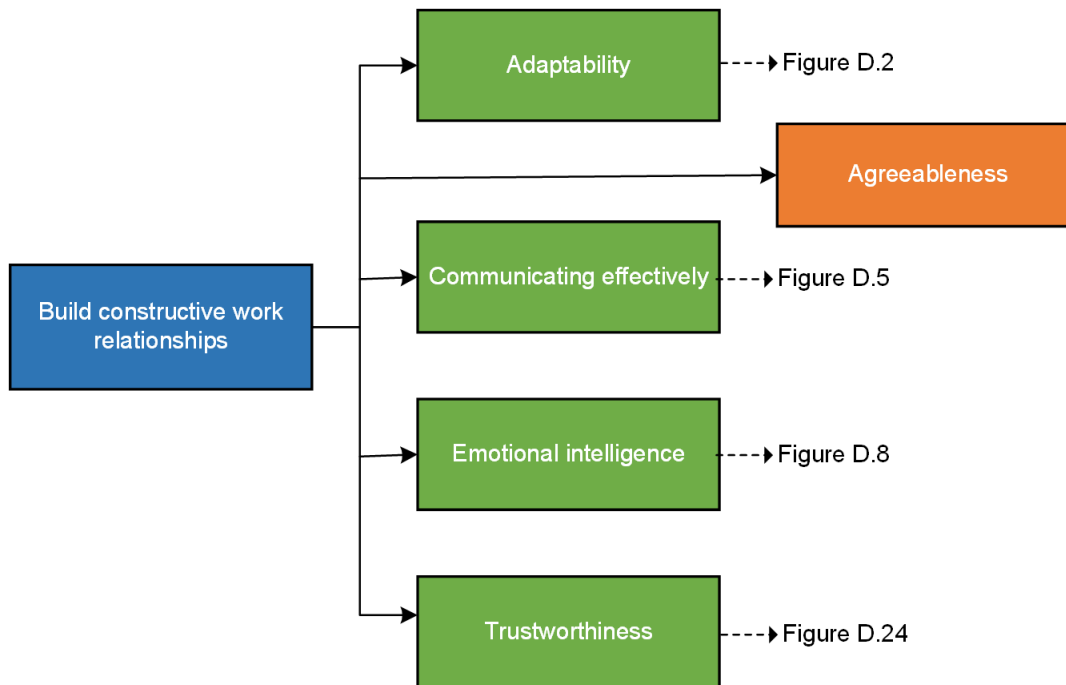


Definition and/or Context

“We need both leaders and tools that can visualize multiple battlespaces and execute rapid decision making in any type of conflict” (Saltzman and the Air Force Strategic Integration Group, 2018, p. 14).

Component	Type	Justification and/or Source
Situational awareness	Construct	Contributes to awareness of the battlefield environment
Spatial awareness	Attribute	Contributes to the ability to visualize multiple battlespaces

Figure C.46. Joint Officer Handbook: Build Constructive Work Relationships

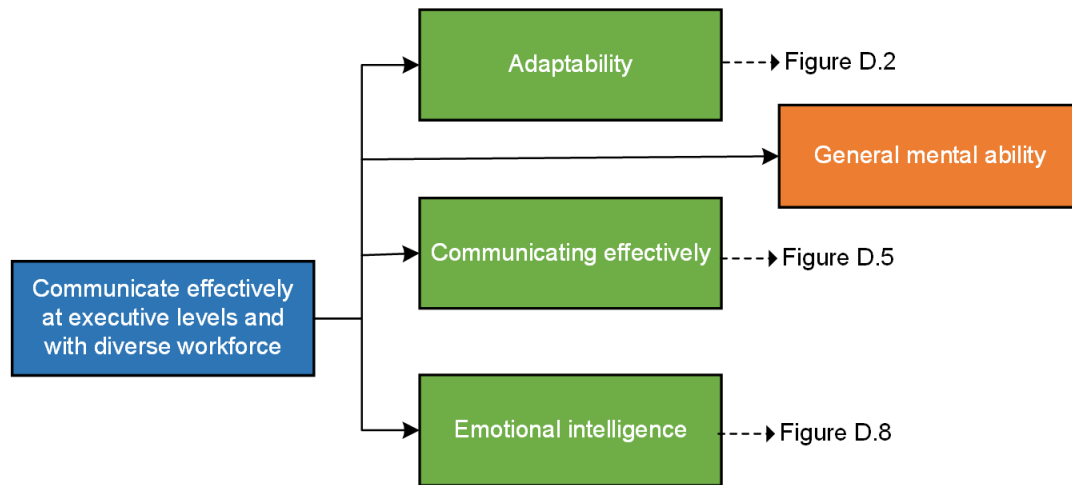


Definition and/or Context

“The diversity of the workforce and the fast-pace in a combatant command require the development of constructive work relationships and good collaborative skills” (Joint Staff J-7, 2011, p. 77).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to working well with colleagues from different backgrounds and in different environments
Communicating effectively	Construct	Contributes to communication with colleagues
Emotional intelligence	Construct	Contributes to relationship-building with colleagues
Trustworthiness	Construct	Contributes to being perceived positively by colleagues
Agreeableness	Attribute	Contributes to being perceived positively by colleagues

Figure C.47. Joint Officer Handbook: Communicate Effectively at Executive Levels and with Diverse Workforce

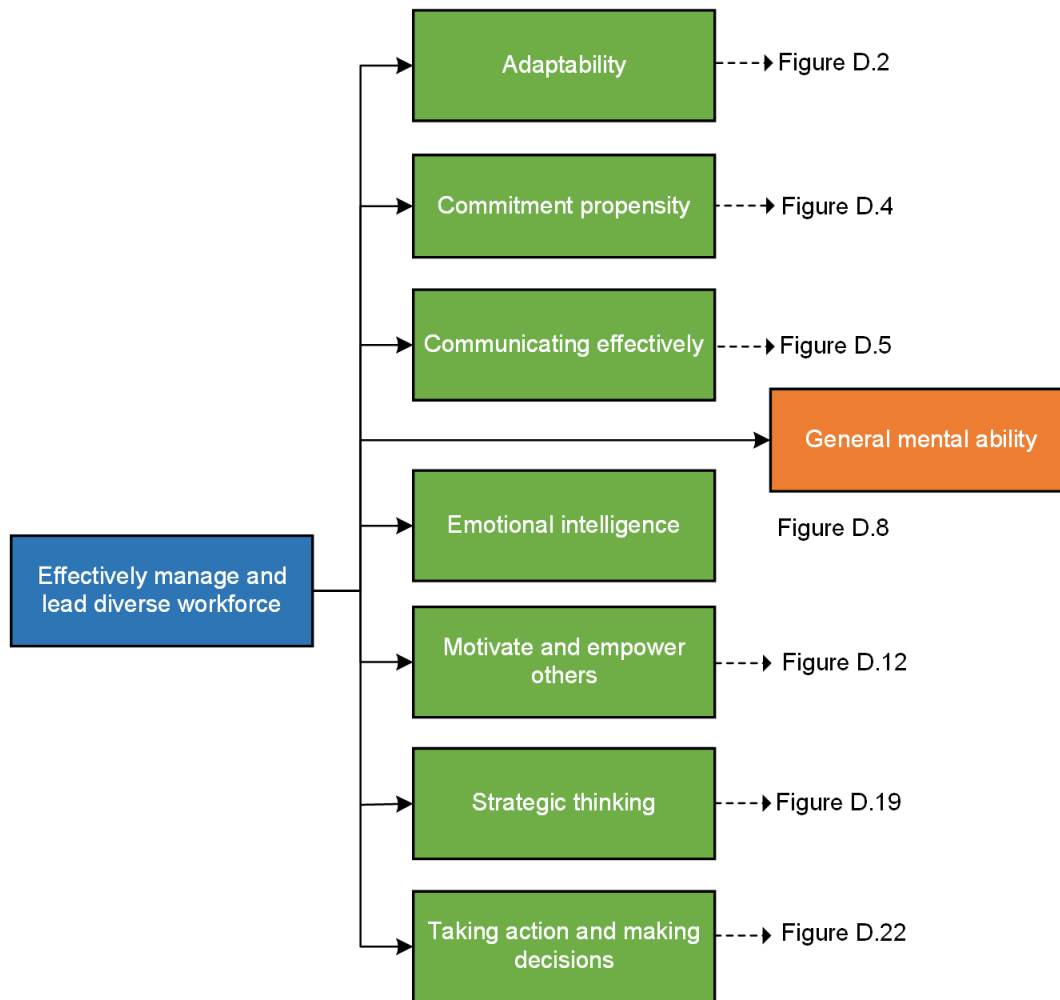


Definition and/or Context

"To communicate effectively across such a diverse workforce joint staff officers need to be diplomatic, supportive, well-spoken, and open in communications" (Joint Staff J-7, 2011, p. 28).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to communicating effectively with colleagues from different backgrounds and in different environments
Communicating effectively	Construct	Inherent to the requirement
Emotional intelligence	Construct	Contributes to a communicator's ability to listen and understand audience perspective (see Goleman, 1995, pp. 97, 195)
General mental ability	Attribute	Contributes to quality of communication (see McCroskey, 1984, p. 264)

Figure C.48. Joint Officer Handbook: Effectively Manage and Lead Diverse Workforce



Definition and/or Context

Joint staff officers must be able to “effectively manage and lead in a diverse work environment (civilians, contractors, Guard and Reserve, Service Components personnel, interagency and multinational personnel)” (Joint Staff J-7, 2011, p. 2).

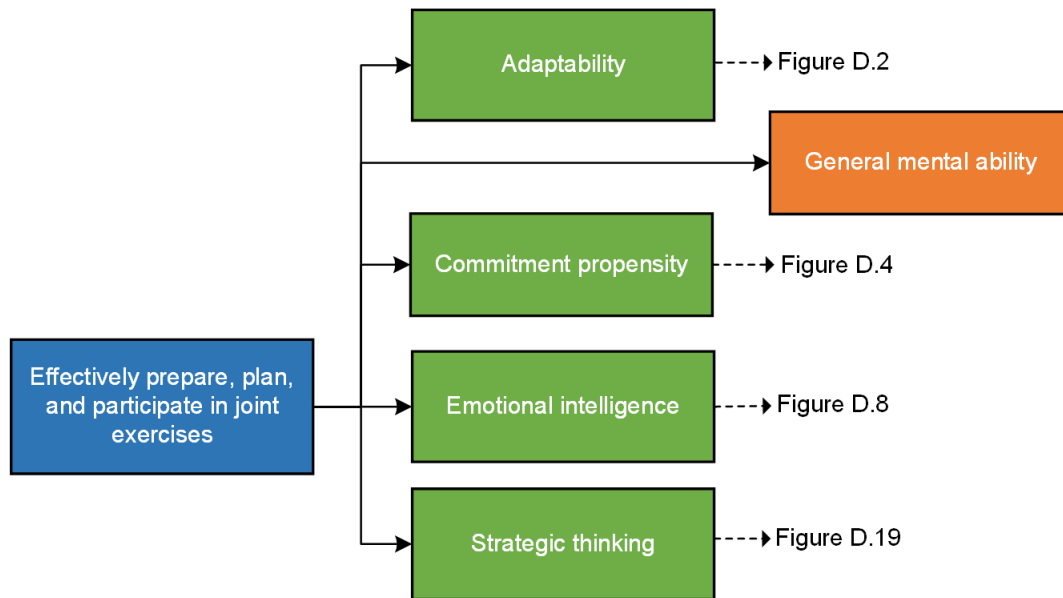
Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in diverse and potentially challenging joint environments
Commitment propensity	Construct	Contributes to personal commitment to an organization and its mission when leading others in a diverse work environment
Communicating effectively	Construct	Contributes to the ability to communicate with diverse groups of people
Emotional intelligence	Construct	Contributes to the ability to understand others' emotions, perspectives, and goals, along with the dynamics of social situations, including in diverse work environments
Motivate and empower others	Construct	Contributes to the ability to manage and lead others in a diverse work environment
Strategic thinking	Construct	Contributes to the ability to consider potential courses of action while leading others in a diverse work environment

Definition and/or Context

Joint staff officers must be able to “effectively manage and lead in a diverse work environment (civilians, contractors, Guard and Reserve, Service Components personnel, interagency and multinational personnel)” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Taking action and making decisions	Construct	Contributes to the ability to take action and make decisions as a leader in a diverse work environment
General mental ability	Attribute	Contributes to the ability to understand and think through management dynamics in a diverse work environment

Figure C.49. Joint Officer Handbook: Effectively Prepare, Plan, and Participate in Joint Exercises

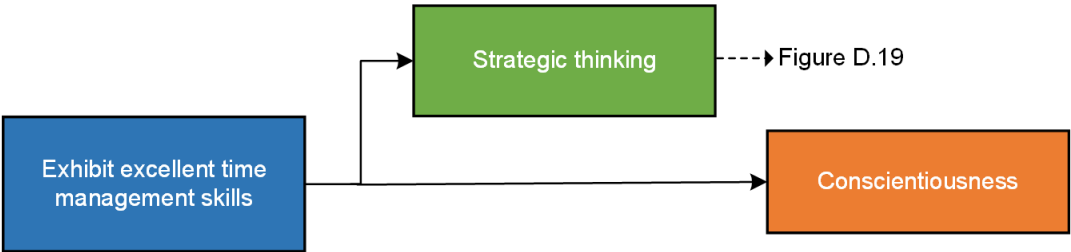


Definition and/or Context

Joint staff officers must be able to “effectively participate in exercise preparation” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Commitment propensity	Construct	Contributes to personal commitment to an exercise and its success
Emotional intelligence	Construct	Contributes to the ability to understand others' emotions, perspectives, and goals when planning and participating in exercises
Strategic thinking	Construct	“Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments, in which success usually requires voluntary collaboration between independent organizations that are frequently pursuing different agendas” (Markel et al., 2011, p. xv). Contributes to the ability to think through how to best use available resources to carry out an exercise
General mental ability	Attribute	Contributes to the ability to think through how to best use available resources to carry out an exercise

Figure C.50. Joint Officer Handbook: Exhibit Excellent Time-Management Skills

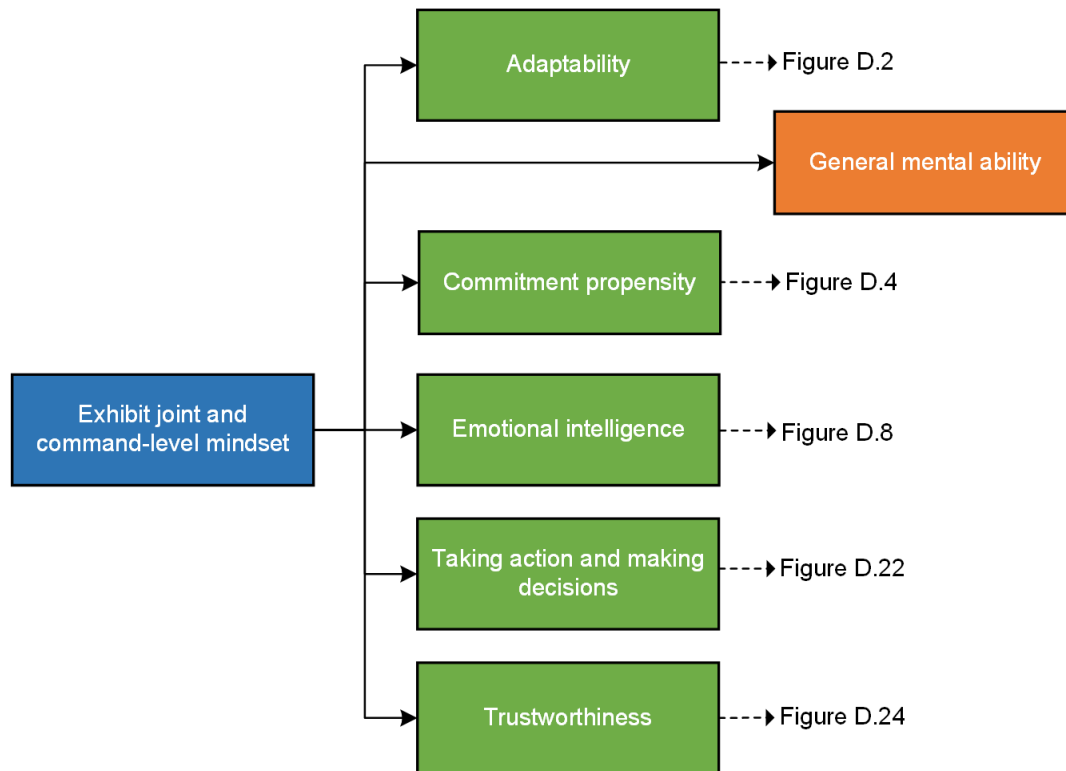


Definition and/or Context

Joint staff officers must “exhibit excellent time management skills” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Strategic thinking	Construct	Contributes to the ability to plan out how to accomplish tasks within allotted time constraints
Conscientiousness	Attribute	Contributes to the ability to be organized, thorough, and responsible in carrying out tasks within allotted time constraints

Figure C.51. Joint Officer Handbook: Exhibit Joint and Command-Level Mindset

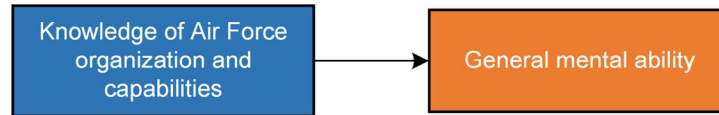


Definition and/or Context

Joint staff officers must “exhibit joint and command-level mindset” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Commitment propensity	Construct	Contributes to personal commitment to joint organizations and supporting joint missions and objectives
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations “Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments, in which success usually requires voluntary collaboration between independent organizations that are frequently pursuing different agendas” (Markel et al., 2011, p. xv).
Taking action and making decisions	Construct	Contributes to the ability to take action and make decisions as a commander in the joint environment
Trustworthiness	Construct	Contributes to being perceived as exhibiting joint and command-level mindset by others
General mental ability	Attribute	Contributes to the quality of thinking as a commander in the joint environment

Figure C.52. Joint Officer Handbook: Knowledge of Air Force Organization and Capabilities

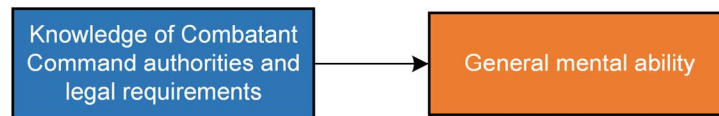


Definition and/or Context

Joint staff officers must be “highly knowledgeable of [their] Service organization, capabilities, and business practices” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand Air Force organization and capabilities

Figure C.53. Joint Officer Handbook: Knowledge of Combatant Command Authorities and Legal Requirements

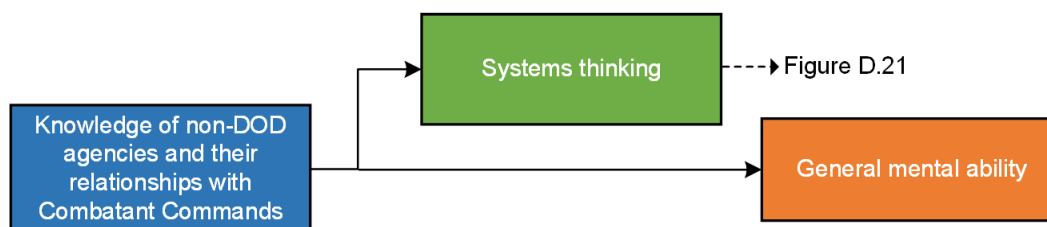


Definition and/or Context

Joint staff officers must be “knowledgeable of authorities and legal requirements affecting the combatant commands” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand combatant command authorities and legal requirements

Figure C.54. Joint Officer Handbook: Knowledge of Non-DoD Agencies and Their Relationships with Combatant Commands

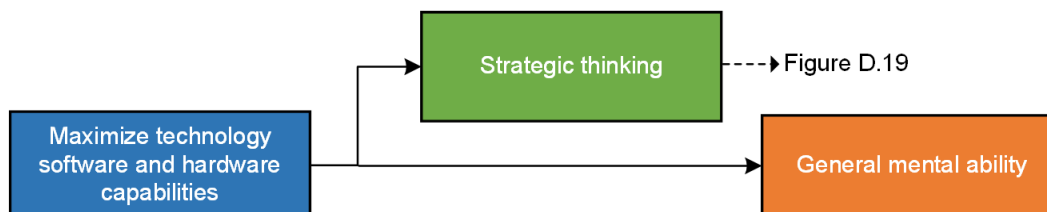


Definition and/or Context

Joint staff officers must be “knowledgeable of U.S. Government Agencies (State Department, Justice, Department of Homeland Security, Department of the Treasury, etc.) and cognizant of their relationships with the combatant commands” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Systems thinking	Construct	Contributes to systematic understanding of non-DoD agencies and their relationships with combatant commands
General mental ability	Attribute	Contributes to the ability to learn about and understand non-DoD agencies and their relationships with combatant commands

Figure C.55. Joint Officer Handbook: Maximize Technology Software and Hardware Capabilities

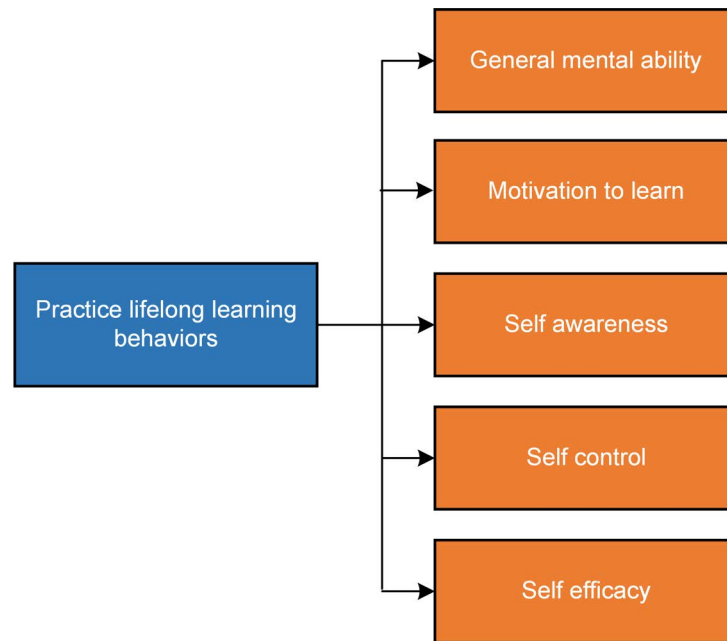


Definition and/or Context

Joint staff officers must be able to “maximize technology software and hardware capabilities” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Strategic thinking	Construct	Contributes to the ability to consider different ways to use technological capabilities to achieve organizational goals
General mental ability	Attribute	Contributes to the ability to learn about and understand technology software and hardware capabilities

Figure C.56. Joint Officer Handbook: Practice Lifelong Learning Behaviors

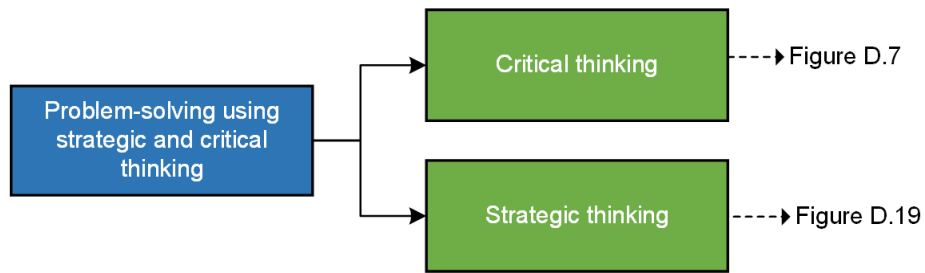


Definition and/or Context

Joint staff officers must “practice lifelong learning behaviors” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn
Motivation to learn	Attribute	Contributes to personal commitment to learning
Self-awareness	Attribute	Contributes to understanding the gaps in one’s knowledge that require additional learning to fill
Self-control	Attribute	Contributes to devoting time and attention to learning, especially on challenging topics
Self-efficacy	Attribute	Contributes to confidence in one’s ability to learn, especially on challenging topics

Figure C.57. Joint Officer Handbook: Problem-Solving Using Strategic and Critical Thinking

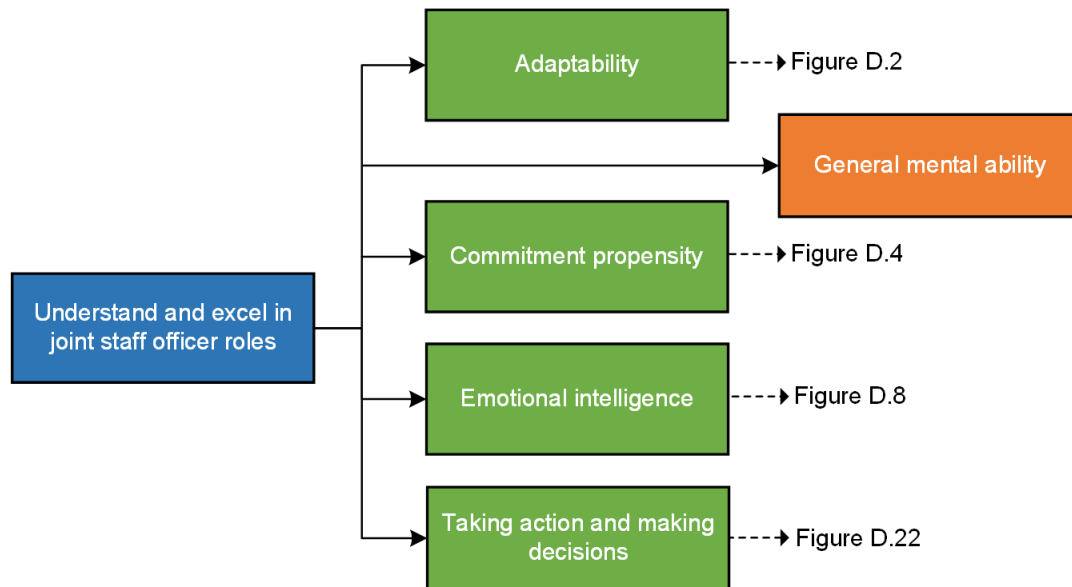


Definition and/or Context

Joint staff officers must be able to “use well-developed strategic and higher order critical thinking skills for task assignments and problem solving” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Critical thinking	Construct	Inherent to the requirement
Strategic thinking	Construct	Inherent to the requirement

Figure C.58. Joint Officer Handbook: Understand and Excel in Joint Staff Officer Roles

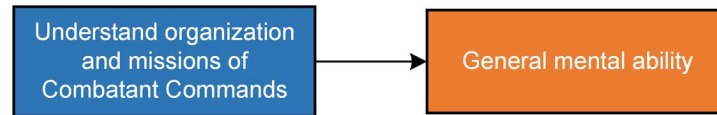


Definition and/or Context

Joint staff officers must be able to “understand the role(s) of a joint staff officer and perform work requirements consistently at a high level of proficiency” (Joint Staff J-7, 2011, p. 1).

Component	Type	Justification and/or Source
Adaptability	Construct	Contributes to the ability to succeed in different and potentially challenging joint environments
Commitment propensity	Construct	Contributes to personal commitment to joint organizations and supporting joint missions and objectives
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations “Interpersonal skills . . . tend to be of primary importance in [joint, interagency, intergovernmental, and multinational] environments, in which success usually requires voluntary collaboration between independent organizations that are frequently pursuing different agendas” (Markel et al., 2011, p. xv).
Taking action and making decisions	Construct	Contributes to the ability to take action and make decisions as a joint staff officer
General mental ability	Attribute	Contributes to the ability to learn about, understand, and carry out joint staff officer roles

Figure C.59. Joint Officer Handbook: Understand Organization and Missions of Combatant Commands

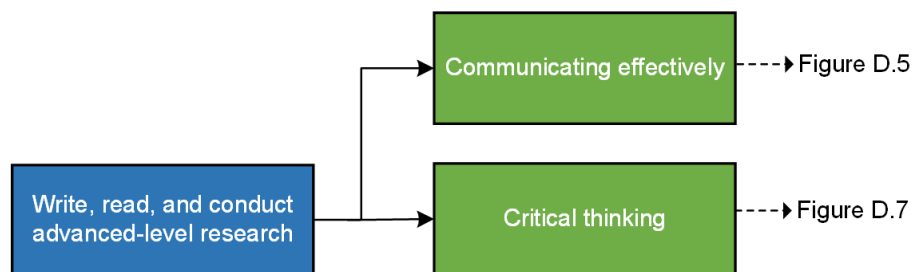


Definition and/or Context

Joint staff officers must be able to “understand the organization and missions of the . . . combatant commands” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand the organization and missions of combatant commands

Figure C.60. Joint Officer Handbook: Write, Read, and Conduct Advanced-Level Research



Definition and/or Context

Joint staff officers must be able to “write, read, and conduct research at an advanced level appropriate for work in an executive environment” (Joint Staff J-7, 2011, p. 2).

Component	Type	Justification and/or Source
Communicating effectively	Construct	Contributes to the ability to write at an advanced level
Critical thinking	Construct	Contributes to the ability to weigh different information, opinions, and sources while reading and conducting research at an advanced level

Appendix D. Deconstruction Results of Constituent Constructs

This appendix provides the deconstructions for each of the 26 constituent constructs identified in our analysis and listed in Table D.1. Details on how to use this appendix to trace the full deconstruction of each requirement are found at the beginning of Appendix C. Details on the methodology used to identify and deconstruct these 26 constructs can be found in Chapter 4 of the main report.

For each construct, we show only the initial deconstruction into its immediate components: constructs and attributes. The table below each figure shows the definition of each construct and the justifications used in identifying each of its components. References to the relevant figures showing the further deconstruction of each component construct are provided in Table D.1.

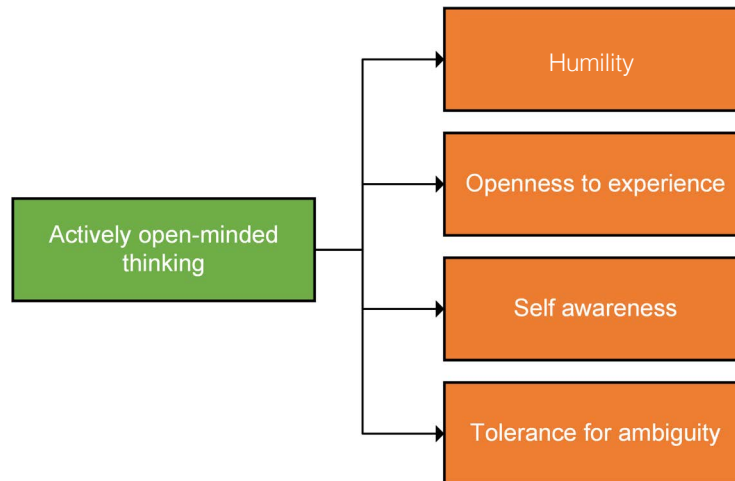
The construct figures are provided in alphabetical order. The elements used in the deconstruction diagrams are color-coded as follows: Green boxes are for constituent constructs, and orange boxes are for attributes.

Table D.1. Constituent Constructs Identified and Deconstructed

Constituent Construct	Corresponding Figure
Actively open-minded thinking	Figure D.1
Adaptability	Figure D.2
Assess risk	Figure D.3
Commitment propensity	Figure D.4
Communicating effectively	Figure D.5
Creative thinking	Figure D.6
Critical thinking	Figure D.7
Emotional intelligence	Figure D.8
Intuition	Figure D.9
Military bearing	Figure D.10
Moral courage	Figure D.11
Motivate and empower others	Figure D.12
Multicultural competency	Figure D.13
Physical courage	Figure D.14
Probabilistic thinking	Figure D.15
Psychological fitness	Figure D.16
Selfless service	Figure D.17
Situational awareness	Figure D.18
Strategic thinking	Figure D.19

Constituent Construct	Corresponding Figure
Supporting leader development	Figure D.20
Systems thinking	Figure D.21
Taking action and making decisions	Figure D.22
Tenacity	Figure D.23
Trustworthiness	Figure D.24
Understand organizational capacities, limitations, and goals	Figure D.25
Understand the environment	Figure D.26

Figure D.1. Actively Open-Minded Thinking

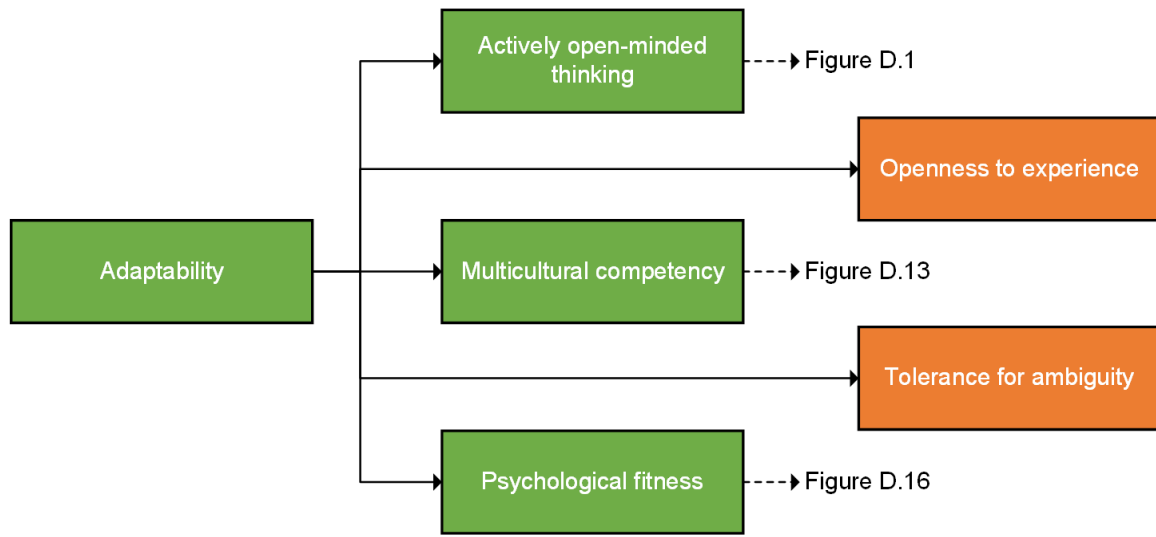


Definition

A person who engages in “actively open-minded thinking” is always actively seeking and being receptive to criticism and other points of view. They update their beliefs when confronted with new evidence, even if it conflicts with their prior ideas (Tetlock and Gardner, 2015, pp. 126, 191).

Component	Type	Justification and/or Source
Humility	Attribute	Contributes to the ability to seek and receive criticism and to consider other points of view that are different from one’s own
Openness to experience	Attribute	Contributes to intellectual curiosity and openness to new information and others’ points of view
Self-awareness	Attribute	Contributes to awareness of one’s own intellectual biases and knowledge gaps in order to be open to new information and others’ points of view
Tolerance for ambiguity	Attribute	Contributes to being open to different perspectives and to considering multiple and potentially conflicting interpretations of a situation

Figure D.2. Adaptability

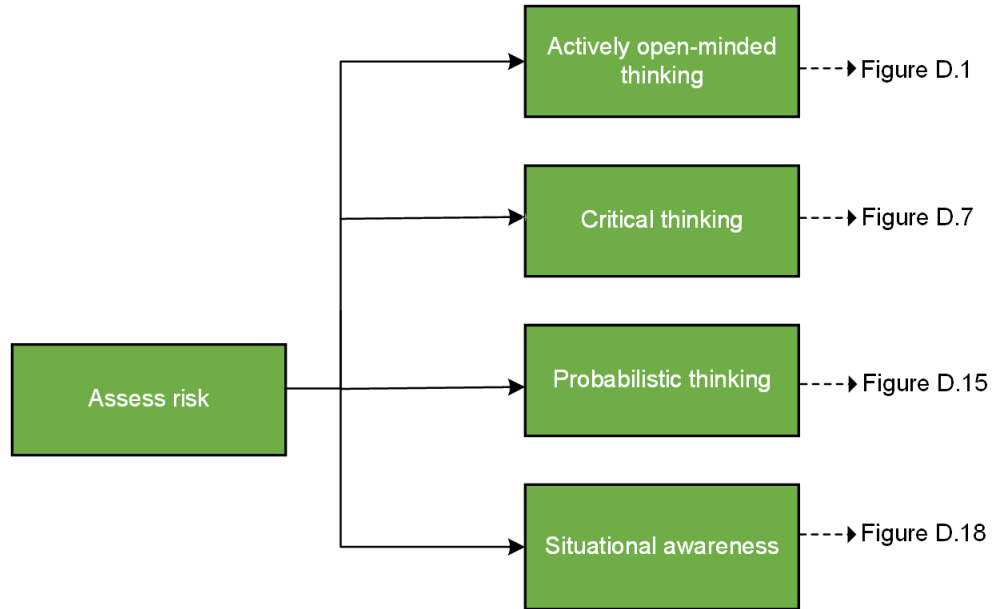


Definition

“The capacity to make appropriate responses to changed or changing situations. . . . The ability to modify or adjust one’s behavior in meeting different circumstances or different people” (American Psychological Association, undated)

Component	Type	Justification and/or Source
Actively open-minded thinking	Construct	Contributes to being receptive to different points of view and different practices
Multicultural competency	Construct	Contributes to acting appropriately in different cultural environments and in working with different people
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to act appropriately, even in new and different environments
Openness to experience	Attribute	Contributes to being receptive to different points of view and different practices
Tolerance for ambiguity	Attribute	Contributes to being receptive to different points of view and different practices

Figure D.3. Assess Risk

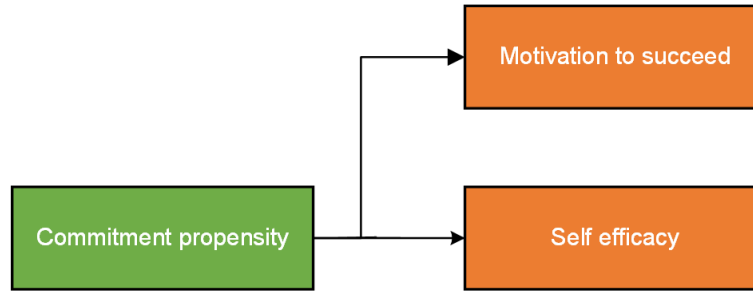


Definition

Risk assessment is “the identification and assessment of hazards” (DoD, 2018, p. 201).

Component	Type	Justification and/or Source
Actively open-minded thinking	Construct	Contributes to the ability to consider new information and perspectives when identifying and assessing risks (Tetlock and Gardner, 2015, pp. 126, 153–155, 191)
Critical thinking	Construct	Contributes to the ability to consider different and potentially conflicting information, opinions, and sources in the process of assessing risk (Joint Publication 2-0, 2013, p. II-10; Straus et al., 2018, p. 16)
Probabilistic thinking	Construct	Contributes to the ability to assess risks in terms of probability of occurrence (Tetlock and Gardner, 2015, p. 191)
Situational awareness	Construct	Contributes to the ability to recognize and detect changes in the risk environment

Figure D.4. Commitment Propensity

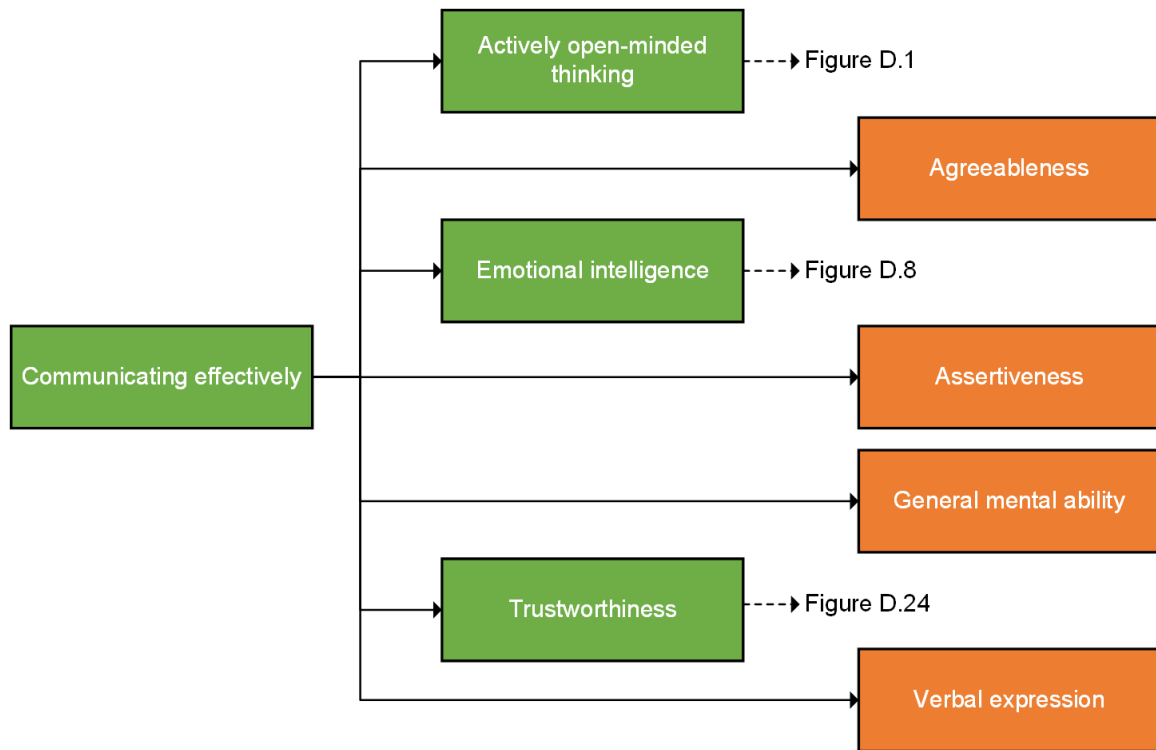


Definition

Commitment propensity measures personal characteristics and experiences that individuals bring to the organization that contribute to their ability and willingness to align their own behaviors with the needs, priorities, and goals of the organization (Lee et al., 1992).

Component	Type	Justification and/or Source
Motivation to succeed	Attribute	Contributes to the willingness to take initiative, be decisive, and take effective action in support of objectives
Self-efficacy	Attribute	Contributes to being confident in one's ability to achieve goals, even when facing obstacles that might otherwise dissuade one from trying to succeed

Figure D.5. Communicating Effectively

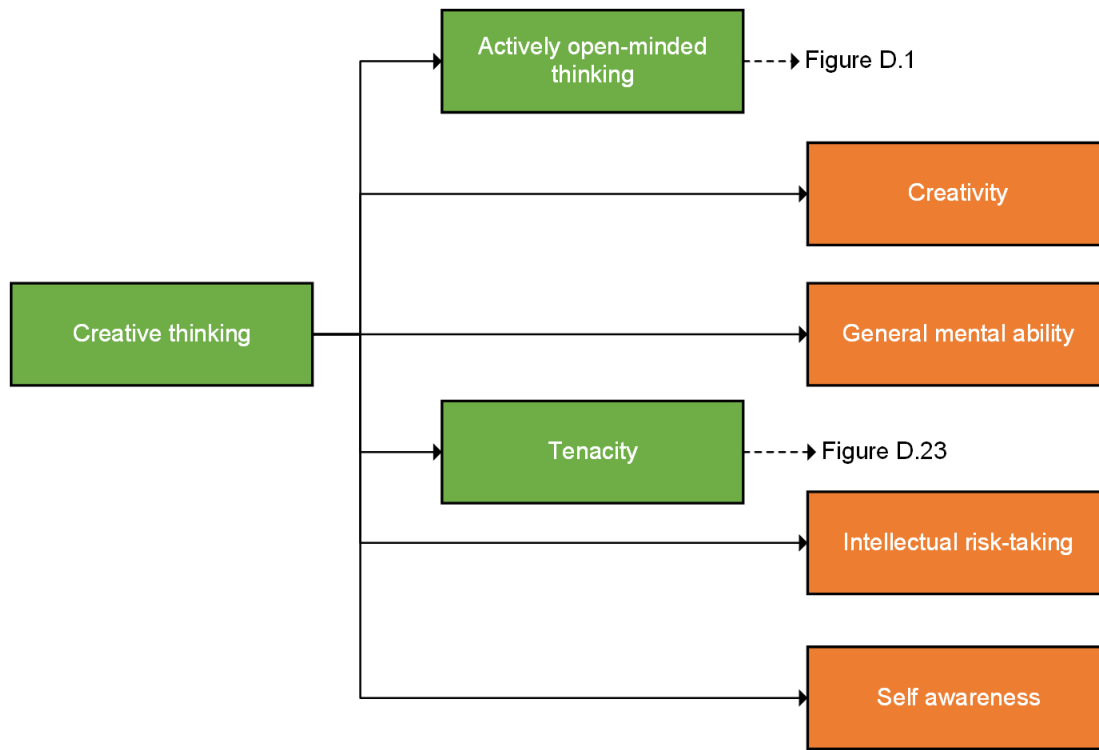


Definition

Effectively “imparting or exchanging . . . information” by speaking, writing, or using some other medium (Oxford English Dictionary, undated-a)

Component	Type	Justification and/or Source
Actively open-minded thinking	Construct	Contributes to a communicator’s ability to listen and understand the audience’s perspective
Emotional intelligence	Construct	Contributes to a communicator’s ability to listen and understand the audience’s perspective (see Goleman, 1995, pp. 97, 195)
Trustworthiness	Construct	Contributes to how communication is perceived by the audience
Agreeableness	Attribute	Contributes to how one engages with others
Assertiveness	Attribute	Contributes to initiating communication
General mental ability	Attribute	Contributes to quality of communication (see McCroskey, 1984, p. 264)
Verbal expression	Attribute	Contributes to quality of communication

Figure D.6. Creative Thinking

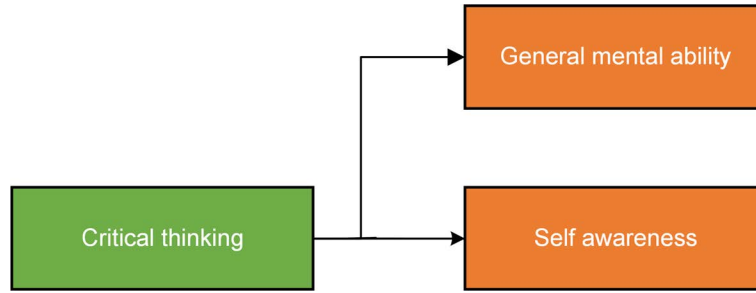


Definition

Creative thinking is “the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations, etc.; originality, progressiveness, or imagination” (Dictionary.com, undated).

Component	Type	Justification and/or Source
Actively open-minded thinking	Construct	Contributes to open-minded exploration of new ideas and methods
Tenacity	Construct	Contributes to willingness to rigorously think through new ideas and methods that are potentially unpopular or that conflict with commonly accepted understanding (Byron, 2006, p. 2)
Creativity	Attribute	Inherent to the construct
General mental ability	Attribute	Contributes to quality of thinking
Intellectual risk-taking	Attribute	Contributes to willingness to consider new ideas and methods that are potentially unpopular or that conflict with commonly accepted understanding (Byron, 2006, p. 2)
Self-awareness	Attribute	Contributes to awareness of one’s own intellectual biases that might prevent consideration of new but potentially valid ideas and methods

Figure D.7. Critical Thinking

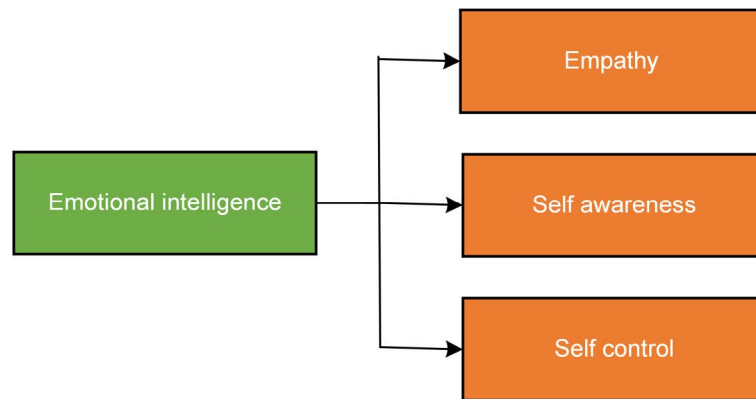


Definition

Critical thinking consists of “judging the credibility of [information] sources and quality of an argument” (Straus et al., 2018, p. 16).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to quality of thinking
Self-awareness	Attribute	Contributes to awareness of one’s own intellectual biases and knowledge gaps that might bias critical thinking

Figure D.8. Emotional Intelligence

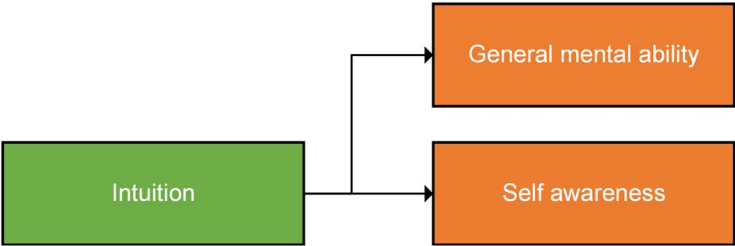


Definition

Emotional intelligence is defined as the ability to understand the emotions and perspectives of others and the dynamics of social situations. It is also the ability to exercise self-control (Goleman, 1995, p. 34).

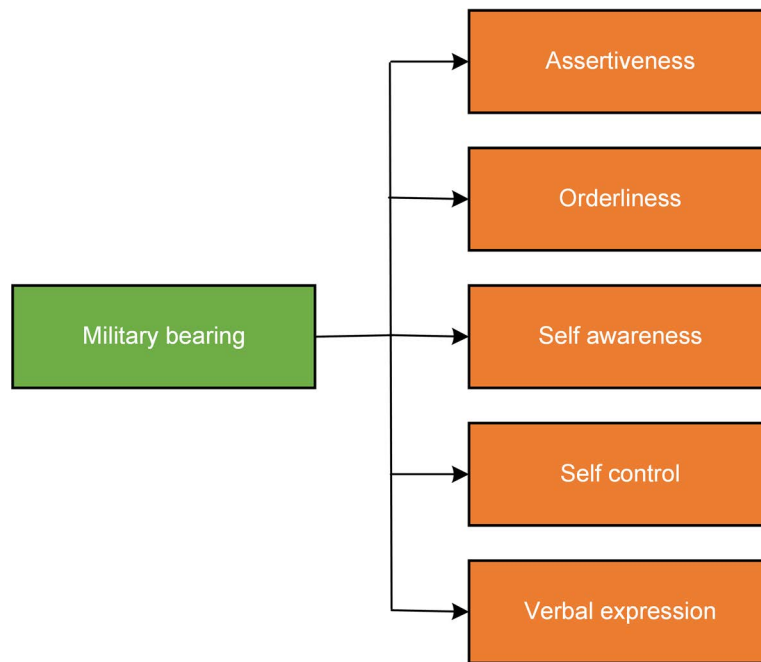
Component	Type	Justification and/or Source
Empathy	Attribute	Contributes to the ability to understand others’ emotions and perspectives
Self-awareness	Attribute	Contributes to awareness of one’s own individual perspective and biases so as not to hinder understanding of others’ emotions and perspectives
Self-control	Attribute	Inherent to the construct

Figure D.9. Intuition



Definition		
<i>Intuition</i> is “the ability to understand something instinctively, without the need for conscious reasoning” (Oxford English Dictionary, undated-c).		
Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to rapidly understand a situation
Self-awareness	Attribute	Contributes to awareness of the limitations of one’s own perspective in the process of rapidly understanding the dynamics of a situation

Figure D.10. Military Bearing



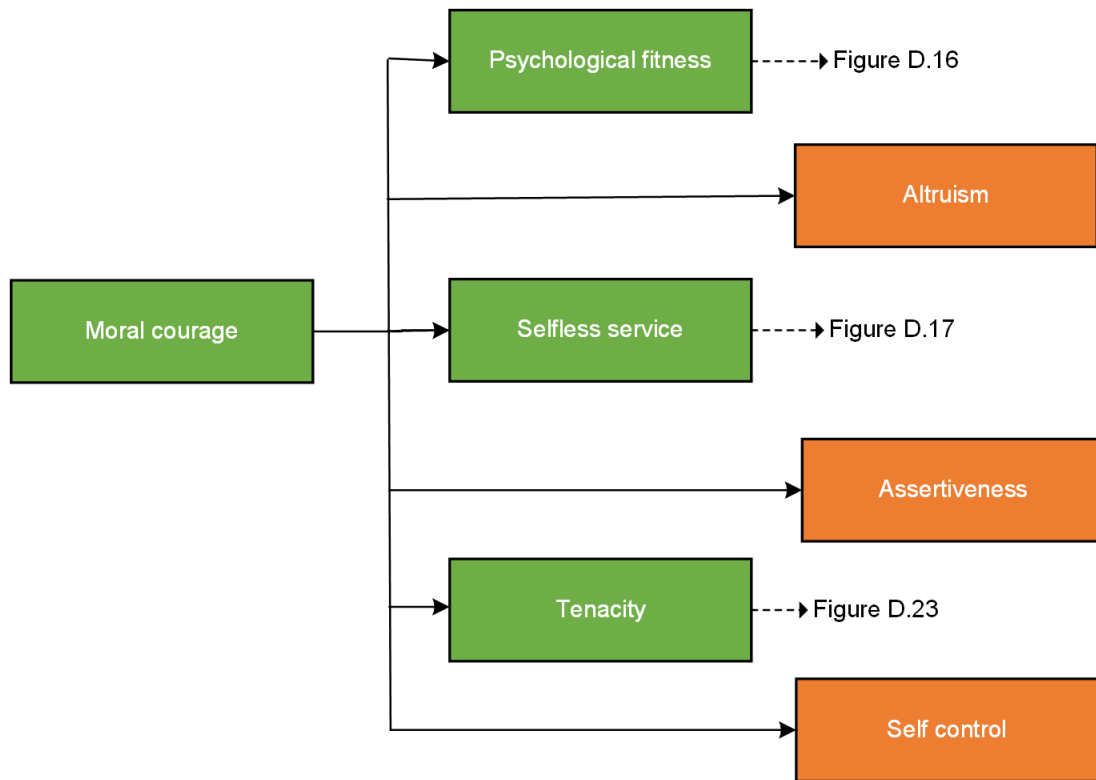
Definition

Military bearing is self-presentation to meet expectations of professional military appearance and behavior.

“Airmen act with confidence, determination, and self-control in all they do to improve themselves and their contribution to the Air Force. They maintain proper professional relationships with subordinates, superiors, and peers. . . . As professionals, Airmen refrain from openly displaying self-pity, discouragement, anger, frustration, or defeatism or displays that would bring discredit upon themselves or the Air Force” (Curtis E. LeMay Center for Doctrine Development and Education, 2015, p. 15).

Component	Type	Justification and/or Source
Assertiveness	Attribute	Inherent to expectations of professional military behavior
Orderliness	Attribute	Inherent to expectations of professional military appearance and behavior
Self-awareness	Attribute	Contributes to awareness of how one appears and behaves and whether it conforms to professional military expectations
Self-control	Attribute	Inherent to expectations of professional military behavior
Verbal expression	Attribute	Contributes to how one communicates with and is perceived by others

Figure D.11. Moral Courage

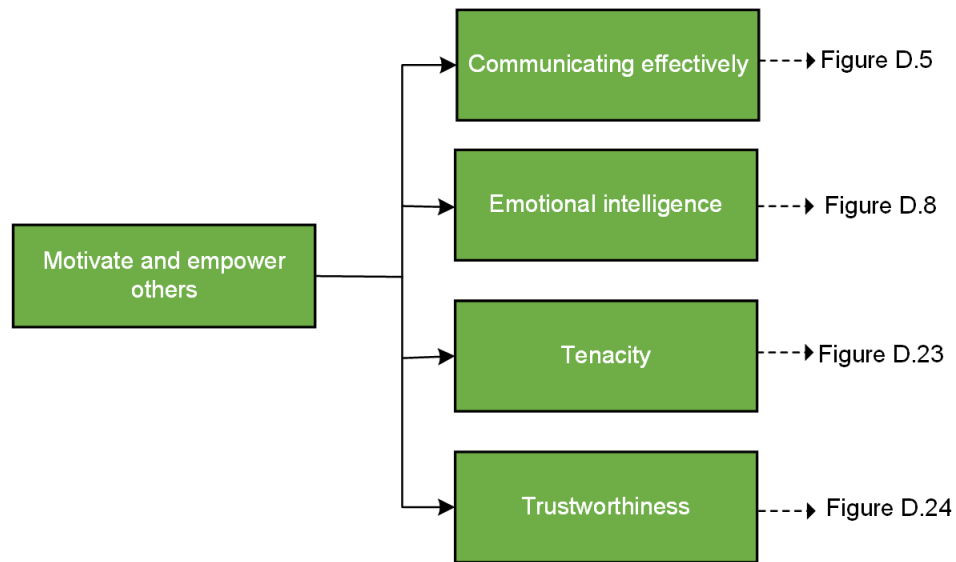


Definition

“Moral courage is the ability to act rightly in the face of popular opposition, or discouragement. This includes the willingness to stand up for what one believes to be right even if that stand is unpopular or contrary to conventional wisdom. This involves risk taking, tenacity, and accountability” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to make ethical decisions, even in situations of potentially extreme stress
Selfless service	Construct	Contributes to personal commitment to others and to the joint force
Tenacity	Construct	Contributes to willingness to steadily and consistently act rightly, even in the face of strong opposition
Altruism	Attribute	Contributes to personal commitment to acting rightly on behalf of others
Assertiveness	Attribute	Contributes to willingness to stand up and visibly act rightly, even in the face of opposition
Self-control	Attribute	Contributes to the ability to act rightly, even in the face of opposition or danger

Figure D.12. Motivate and Empower Others



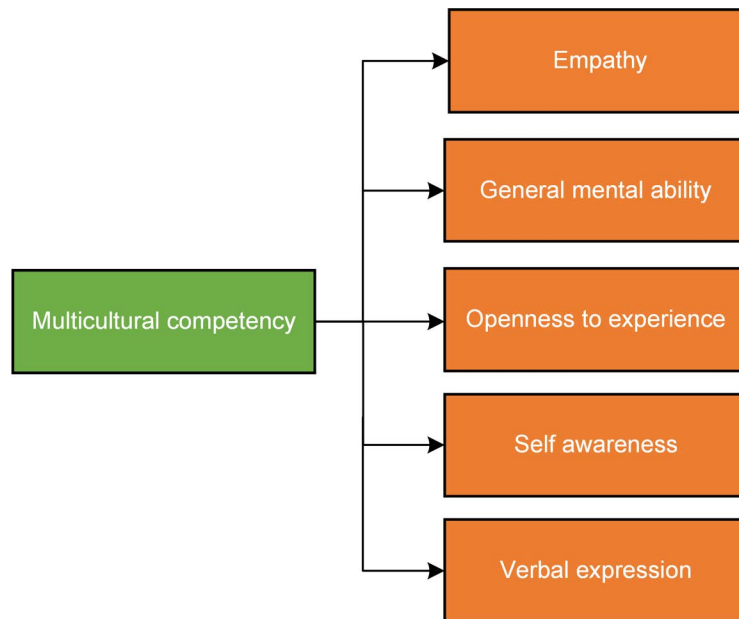
Definition

To *motivate* is to “provide (someone) with a [reason] for doing something” or cause (someone) to have interest in or enthusiasm for something (Oxford English Dictionary, undated-d).

To *empower* is to “give (someone) the authority or power to do something . . . [or] make (someone) stronger and more confident” (Oxford English Dictionary, undated-b).

Component	Type	Justification and/or Source
Communicating effectively	Construct	Contributes to the ability to communicate about goals, motivations, and how to achieve objectives
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
Tenacity	Construct	Contributes to the ability to steadily and confidently set an example and remain on course when motivating others, especially when confronted with difficult leadership challenges
Trustworthiness	Construct	Contributes to being perceived as a reliable and effective leader or team member whose orders or suggestions are worth following

Figure D.13. Multicultural Competency

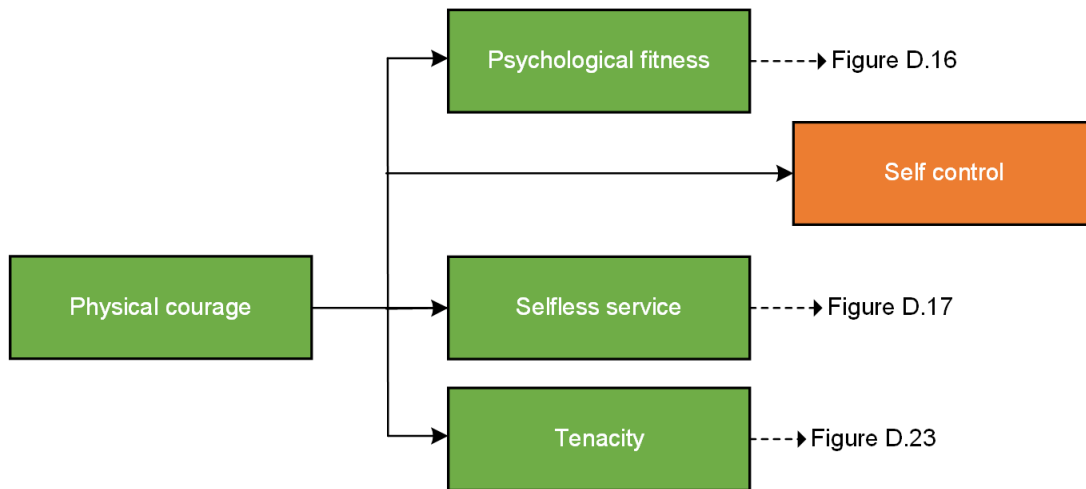


Definition

Also referred to as “cultural competence—loosely defined as the ability to understand, appreciate and interact with people from cultures or belief systems different from one’s own” (DeAngelis, 2015, p. 64)

Component	Type	Justification and/or Source
Empathy	Attribute	Contributes to the ability to understand others’ perspectives, even when they are very different from ones’ own
General mental ability	Attribute	Contributes to the ability to learn about and understand other cultures
Openness to experience	Attribute	Contributes to intellectual curiosity and openness to new cultures and environments
Self-awareness	Attribute	Contributes to awareness of one’s own cultural norms and perspectives and how they differ from those of others
Verbal expression	Attribute	Contributes to communicating effectively with colleagues from different backgrounds and in different cultures and environments

Figure D.14. Physical Courage

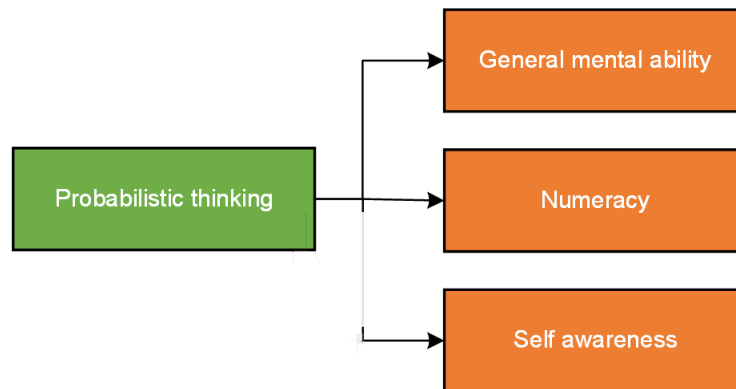


Definition

“Physical courage has throughout history defined warriors. It is the ability to confront physical pain, hardship, death, or threat of death” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Psychological fitness	Construct	Contributes to remaining calm, resilient, and able to take action, even in situations of potentially extreme stress, pain, or danger
Selfless service	Construct	Contributes to personal commitment to act courageously on behalf of others and to achieve mission objectives
Tenacity	Construct	Contributes to willingness to steadily and consistently act rightly, even in the face of physical pain, hardship, or threat of death
Self-control	Attribute	Contributes to maintaining self-control, even in situations of potentially extreme stress, pain, or danger

Figure D.15. Probabilistic Thinking

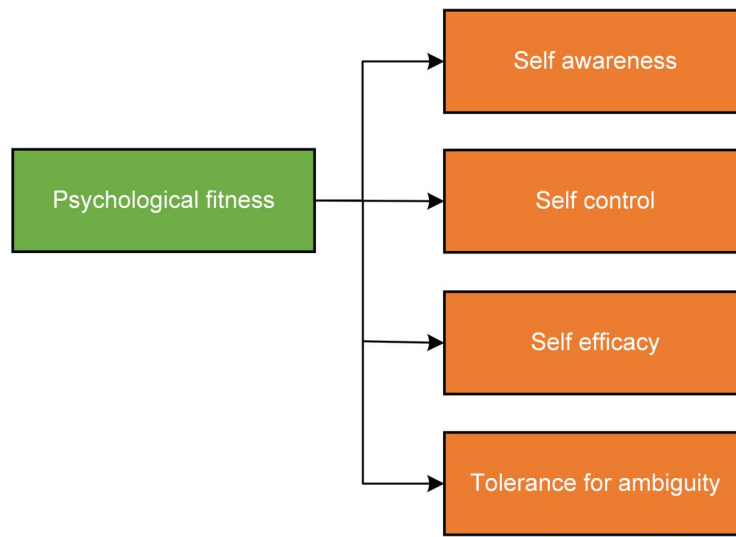


Definition

Probabilistic thinking is “the tendency to adopt a probability [mind]set, discrimination of uncertainty, and the ability to express that uncertainty meaningfully as a numerical probability” (Wright et al., 1978, p. 285).

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to quality of thinking
Numeracy	Attribute	Contributes to the ability to rigorously understand and compare relative differences in probability
Self-awareness	Attribute	“When forecasters are forced to translate terms like serious possibility into numbers, they have to think carefully about how they are thinking” (Tetlock and Gardner, 2015, p. 57).

Figure D.16. Psychological Fitness

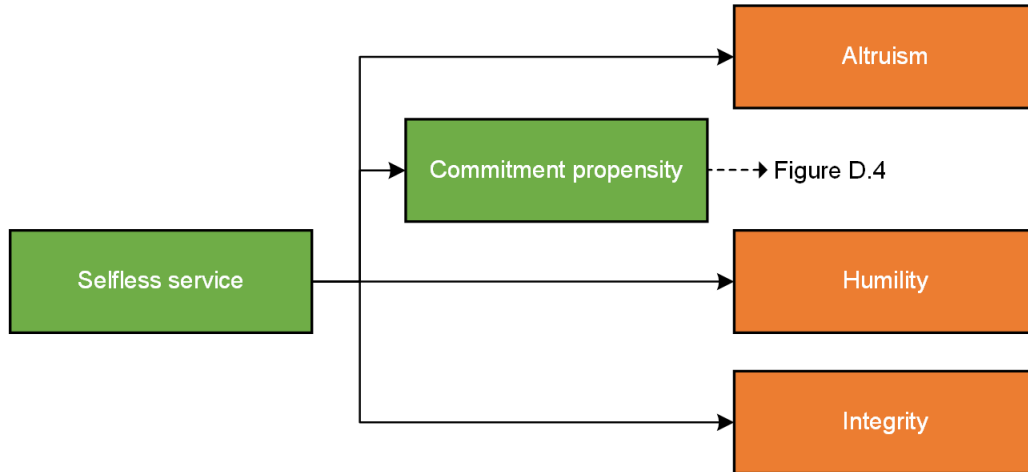


Definition

“Psychological fitness includes the integration and optimization of mental, emotional, and behavioral abilities and capacities to optimize performance and strengthen resilience. It describes a Service member’s ability to effectively cope with the unique mental stresses and challenges of Military Service” (CJCSI 3405.01, 2013, p. A-F-1).

Component	Type	Justification and/or Source
Self-awareness	Attribute	Contributes to remaining aware of one’s psychological and emotional state, which is a key prerequisite to controlling one’s emotions and staying calm when under pressure
Self-control	Attribute	Contributes to the ability to remain calm and in control, even when under extreme pressure
Self-efficacy	Attribute	Contributes to being confident in one’s ability to remain calm and in control, even when under extreme pressure
Tolerance for ambiguity	Attribute	Contributes to being able to cope with uncertain and challenging situations

Figure D.17. Selfless Service

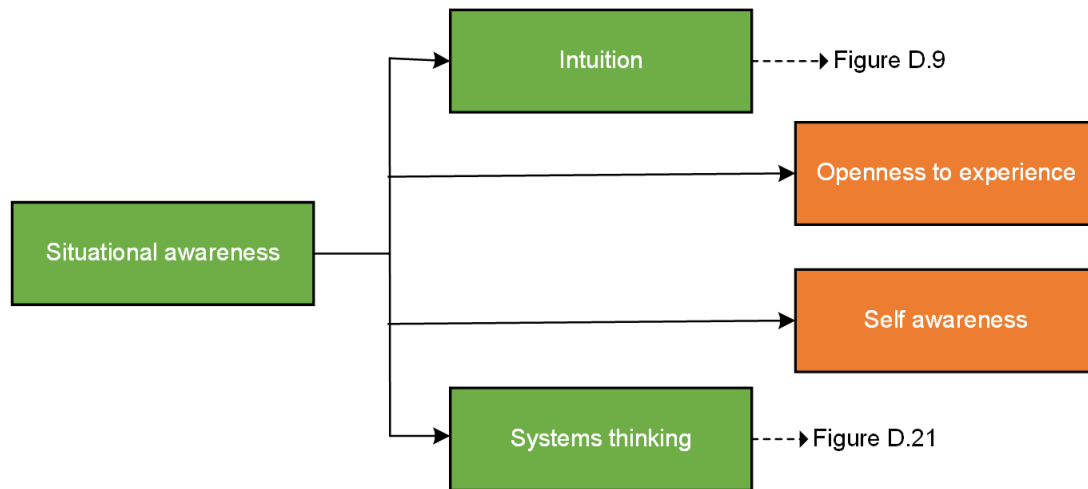


Definition

“Selfless service epitomizes the quality of putting our Nation, our military mission(s), and others before ourselves. Members of the profession of arms do not serve to pursue fame, position, or money. They give of themselves for the greater good. Selfless service is the enabler of teamwork, the cooperative effort by the members of a group to achieve common goals” (Joint Publication 1, 2017, p. B-2).

Component	Type	Justification and/or Source
Commitment propensity	Construct	Contributes to personal commitment to joint organizations and achieving mission objectives
Altruism	Attribute	Contributes to personal commitment to acting rightly on behalf of others
Humility	Attribute	Contributes to selflessness
Integrity	Attribute	Contributes to personal commitment to acting in accordance with moral principles

Figure D.18. Situational Awareness

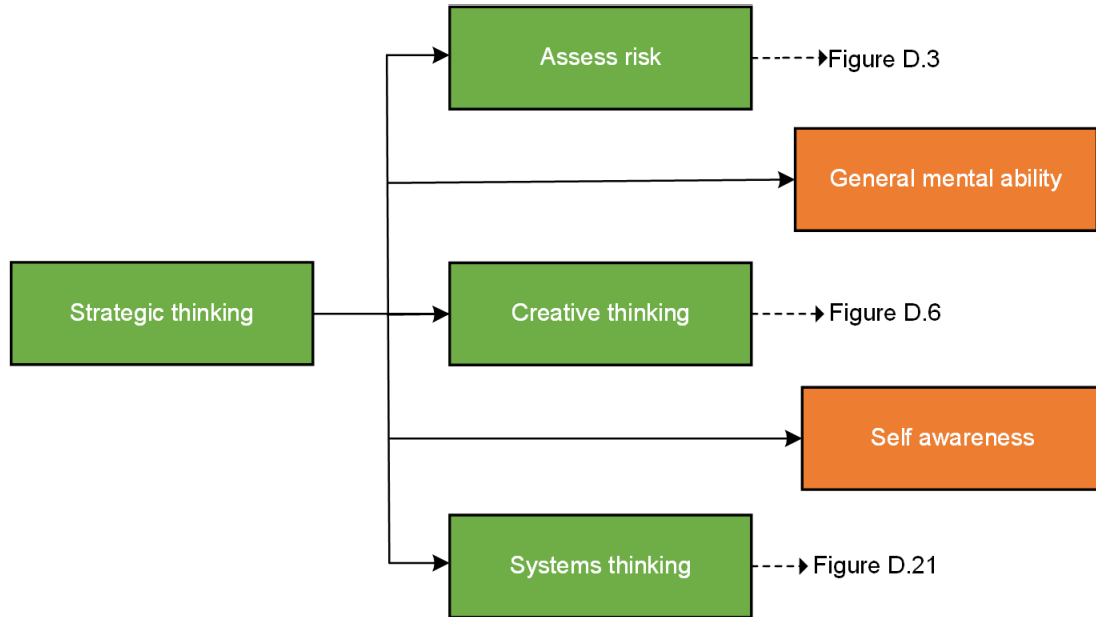


Definition

Situational awareness is “the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future” (quoted in Endsley, 1995, p. 36).

Component	Type	Justification and/or Source
Intuition	Construct	Contributes to immediately understanding the most-important dynamics within a situation or an environment, including changes as they occur
Systems thinking	Construct	Contributes to systematically understanding the relationships between various actors and their environments
Openness to experience	Attribute	Contributes to openly perceiving emerging changes within a situation or an environment, even when they conflict with one’s expectations
Self-awareness	Attribute	Contributes to awareness of the limitations of one’s own perspective in the process of perceiving and understanding the dynamics of a situation or an environment (Endsley, 1995, pp. 40–41)

Figure D.19. Strategic Thinking

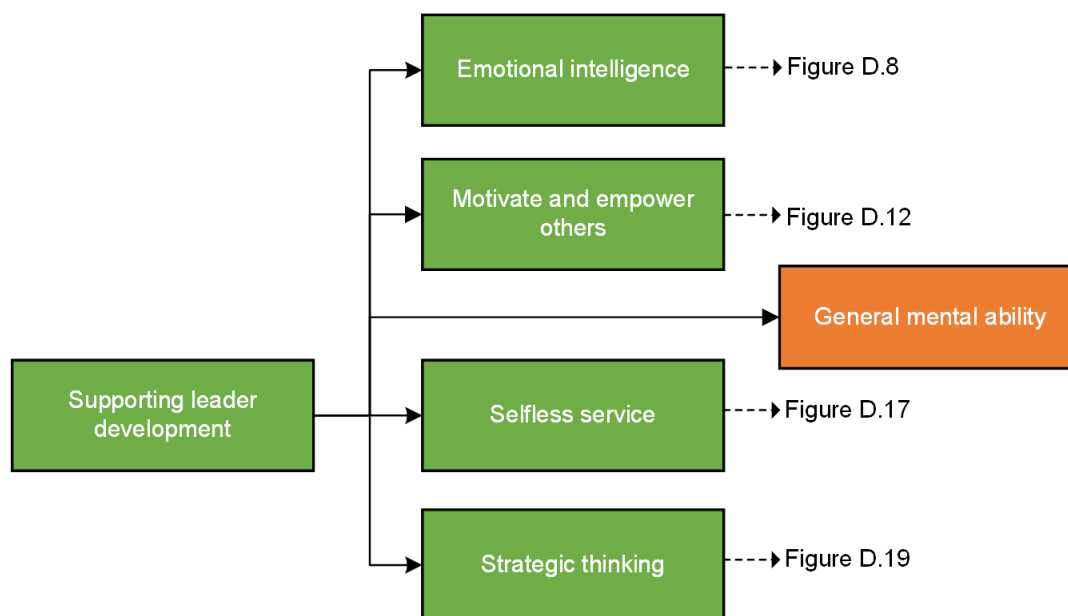


Definition

Strategic thinking is thinking about how to employ organizational or individual capabilities “in a synchronized and integrated fashion” to achieve objectives. This definition is adapted from the DoD definition of *strategy* (DoD, 2018, p. 219).

Component	Type	Justification and/or Source
Assess risk	Construct	Contributes to the ability to consider consequences of potential courses of action
Creative thinking	Construct	Contributes to the ability to discover creative ways of effectively employing available capabilities to achieve goals (Mintzberg, 1994)
Systems thinking	Construct	Contributes to the ability to systematically understand the relationships between various actors, both friendly and unfriendly, with each other and with their environments
General mental ability	Attribute	Contributes to quality of thinking
Self-awareness	Attribute	Contributes to awareness of one’s own individual perspective, expectations, biases, and limitations so as to ensure that they do not hinder objective strategic thinking

Figure D.20. Supporting Leader Development

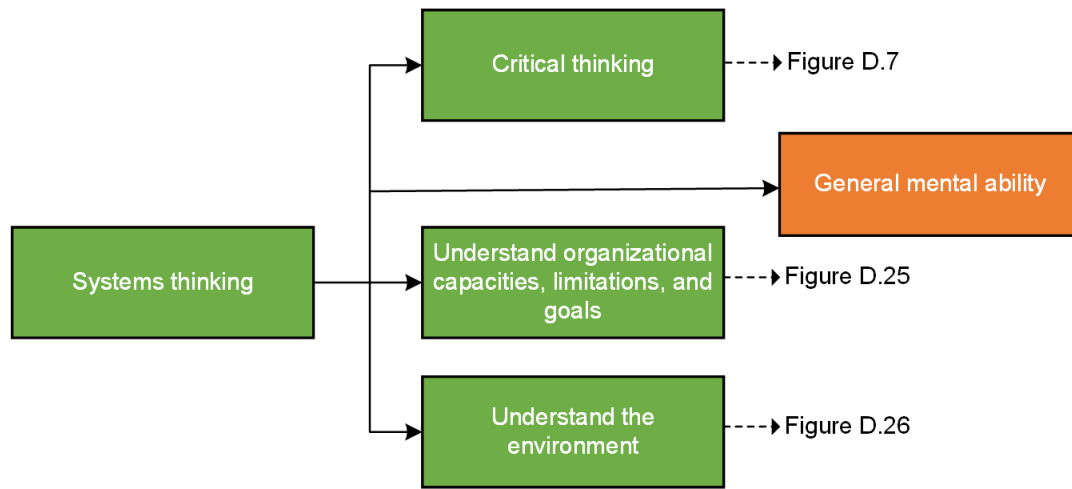


Definition

“The Air Force expects its members to develop leadership skills. The nature and extent of that development depends on the member’s status: officer, enlisted, or civilian. The Air Force expects an officer to move quickly through the levels of leadership, from tactical expertise into operational competence. . . . The abilities of a leader can be improved through deliberate use of force development, built from education, training, inclusive collaboration, and experience” (Curtis E. LeMay Center for Doctrine Development and Education, 2015, p. 28).

Component	Type	Justification and/or Source
Emotional intelligence	Construct	Contributes to the ability to understand others’ emotions, perspectives, and goals, along with the dynamics of social situations
Motivate and empower others	Construct	Contributes to the ability to motivate others to learn, develop as leaders, and gain confidence in their abilities
Selfless service	Construct	Contributes to personal commitment to supporting others, including in their development as leaders
Strategic thinking	Construct	Contributes to the ability to consider how best to use available resources and capabilities to support leader development objectives
General mental ability	Attribute	Contributes to the ability to provide effective instruction and guidance in support of others’ leadership development

Figure D.21. Systems Thinking



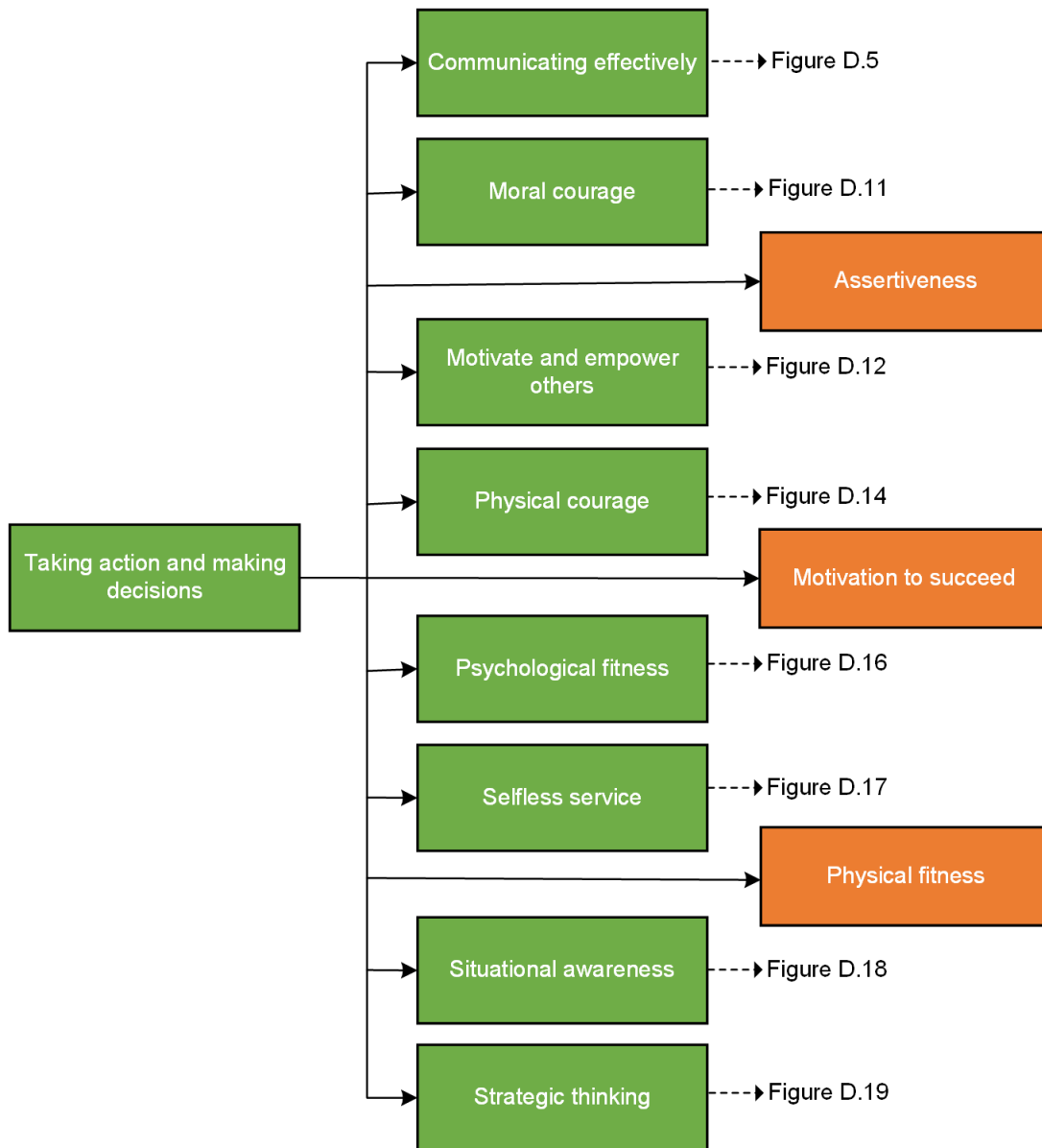
Definition

Systems thinking is the synthesis of often large amounts of information to develop a big-picture, systematic mental model of organizations and their environments.

“Systems thinking . . . involves highly conceptual skills to adopt a big-picture perspective to understand complexity. . . . This construct involves the capacity to create a mental map defining and organizing important elements, interactions, and inter-relationships among multiple organizational units, subsystems, and components” (Straus et al., 2018, p. 90).

Component	Type	Justification and/or Source
Critical thinking	Construct	Contributes to the ability to deliberately weigh different information, opinions, and sources to understand complex systems and the relationships between their components
Understand organizational capacities, limitations, and goals	Construct	Inherent to the construct
Understand the environment	Construct	Inherent to the construct
General mental ability	Attribute	Contributes to quality of thinking

Figure D.22. Taking Action and Making Decisions



Definition

As used in this report, this construct entails the ability to effectively make decisions and take action in a variety of contexts. This includes acting individually or as a leader or a subordinate within a team.

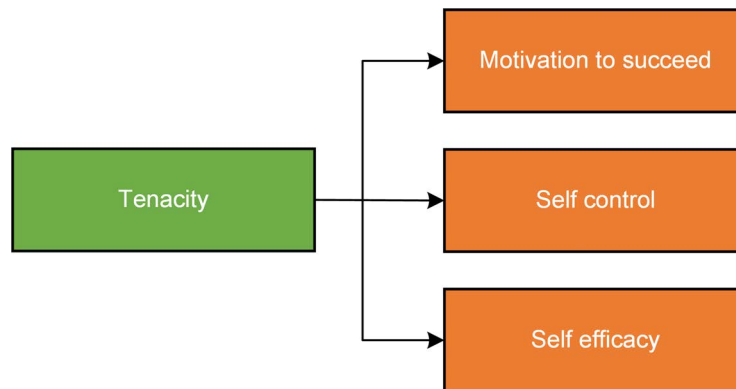
Component	Type	Justification and/or Source
Communicating effectively	Construct	Contributes to communicating effectively in the context of making decisions and taking action
Moral courage	Construct	Contributes to making ethical decisions and acting rightly, even in challenging situations
Motivate and empower others	Construct	Contributes to working with others, including as a leader, in the context of making decisions and taking action

Definition

As used in this report, this construct entails the ability to effectively make decisions and take action in a variety of contexts. This includes acting individually or as a leader or a subordinate within a team.

Component	Type	Justification and/or Source
Physical courage	Construct	Contributes to making decisions and acting rightly, even in situations of potentially extreme stress, pain, or danger
Psychological fitness	Construct	Contributes to remaining calm and in control, even in challenging situations
Selfless service	Construct	Contributes to personal commitment to selflessly act on behalf of others or to achieve organizational goals
Situational awareness	Construct	Contributes to awareness of one's situation and environment in the context of making decisions and taking effective action
Strategic thinking	Construct	Contributes to the ability to consider how best to use available resources to achieve objectives as part of making effective decisions
Assertiveness	Attribute	Contributes to taking initiative, even in the face of potential discouragement or uncertainty, to make decisions and take necessary action
Motivation to succeed	Attribute	Contributes to willingness to take initiative, be decisive, and take effective action in support of objectives
Physical fitness	Attribute	Contributes to the ability to take action when faced with physical challenges or hardship

Figure D.23. Tenacity

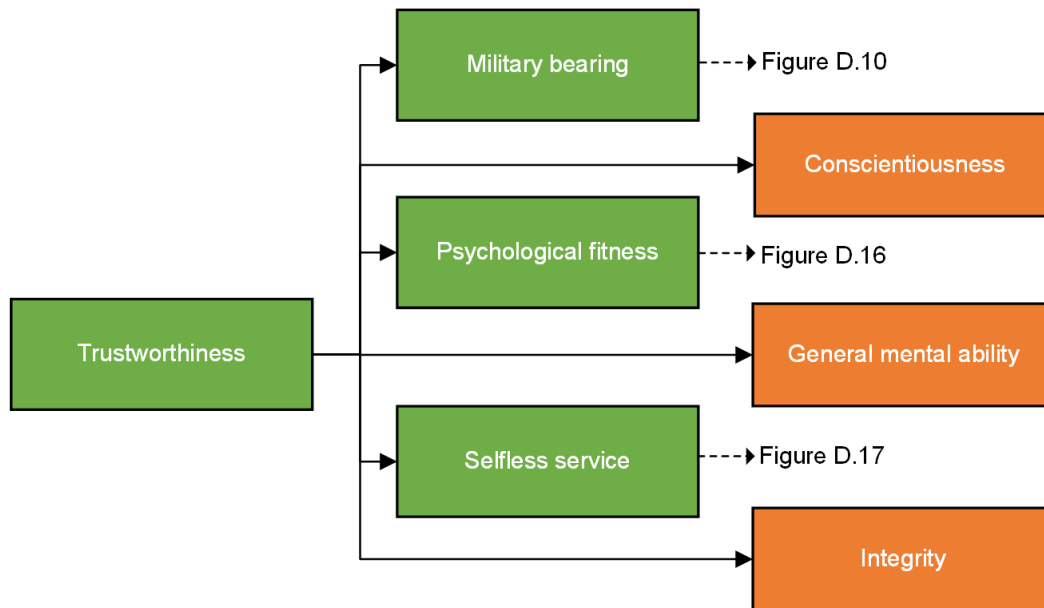


Definition

Tenacity is the “quality of being very determined” in the pursuit of a goal. It is similar to *persistence* and *grit* (Oxford English Dictionary, undated-f).

Component	Type	Justification and/or Source
Motivation to succeed	Attribute	Contributes to personal determination to achieve goals
Self-control	Attribute	Contributes to focused attention and determined action in the pursuit of goals
Self-efficacy	Attribute	Contributes to being confident in one's ability to achieve goals, even when facing obstacles that might otherwise dissuade one from trying to succeed

Figure D.24. Trustworthiness



Definition

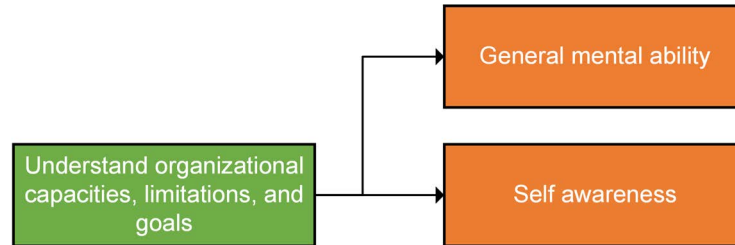
Trustworthiness is to be “worthy of confidence, dependable” (Merriam-Webster, undated-b).

Trustworthiness “is a synonym for credibility. Trustworthiness describes the ability, benevolence and integrity of a trustee” (Colquitt, Scott, and LePine, 2007, pp. 909–927).

“Credibility was noted most often as the most important attribute for an Airman to be an effective joint warfighter. Credibility is earned over time and developed through relationships. . . . Credibility and competency are clearly linked. Credibility is a byproduct of joint competency and an Airmen’s reputation is directly linked to their establishment of trust and confidence in their job performance from both their joint superiors and peers” (Department of the Air Force, undated, p. 3).

Component	Type	Justification and/or Source
Military bearing	Construct	Contributes to being perceived positively by colleagues
Psychological fitness	Construct	Contributes to being dependable, even in challenging or stressful situations
Selfless service	Construct	Contributes to personal commitment to others and to joint organizations and their objectives
Conscientiousness	Attribute	Contributes to dependability
General mental ability	Attribute	Contributes to quality of work
Integrity	Attribute	Contributes to reliably acting in accordance with strong moral principles, including trust and honesty

Figure D.25. Understand Organizational Capacities, Limitations, and Goals

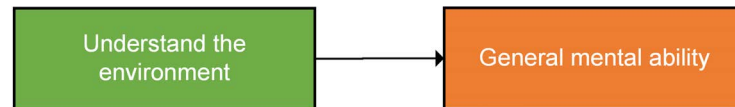


Definition

As used in this report, this construct is the ability to understand organizational capacities, limitations, and goals. This includes understanding the organization of which one is a part, along with other organizations and actors, whether friendly or hostile.

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand organizations
Self-awareness	Attribute	Contributes to awareness of one's own individual perspective and biases so as to ensure that they do not hinder objectively understanding organizations

Figure D.26. Understand the Environment



Definition

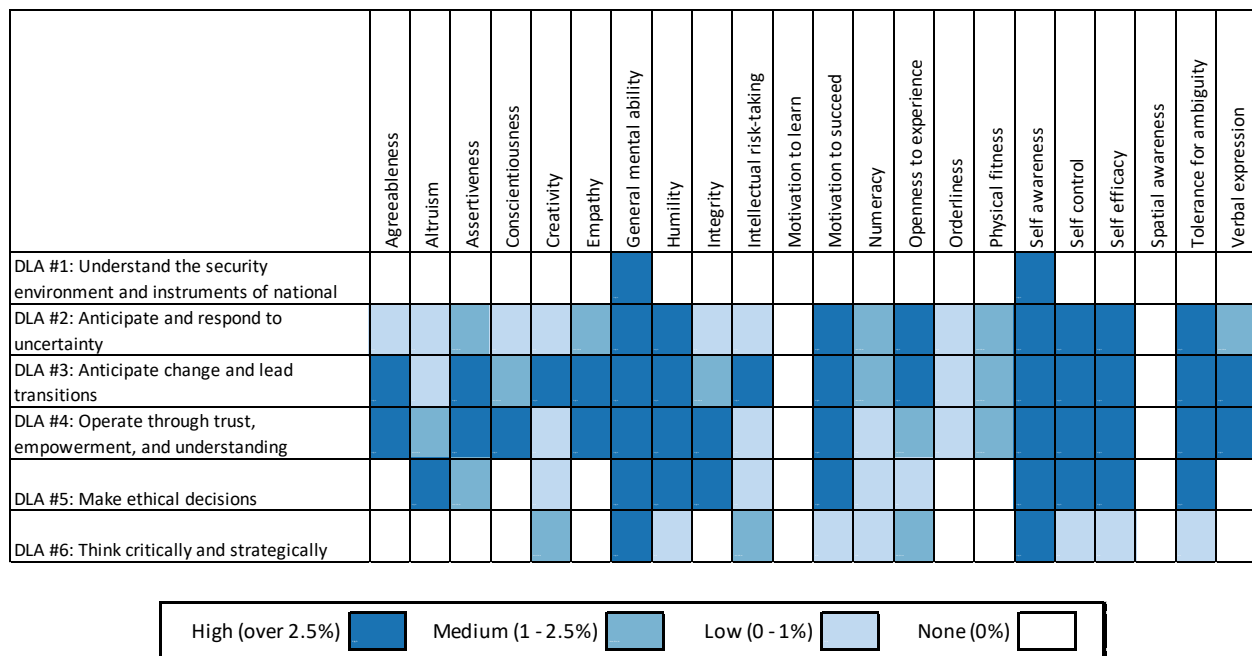
As used in this report, this construct is the ability to understand the dynamics of the environment in which organizations exist. This includes understanding the security environment at all levels, whether strategic, operational, or tactical.

Component	Type	Justification and/or Source
General mental ability	Attribute	Contributes to the ability to learn about and understand the environment

Appendix E. Attribute Proximity Measurement

Figures E.1 through E.7 show the proximity of each of the 22 attributes as measured in the deconstruction of each of the 60 joint requirements. Each figure reflects one of the sources used to identify the 60 requirements. Chapter 5 of the main report contains a full description of how the proximity measure was calculated.

Figure E.1. Attribute Proximity to Desired Leader Attribute Requirements



NOTE: The full text of DLA 1 reads “Understand the security environment and instruments of national power.”

Figure E.2. Attribute Proximity to Enlisted Desired Leader Attribute Requirements

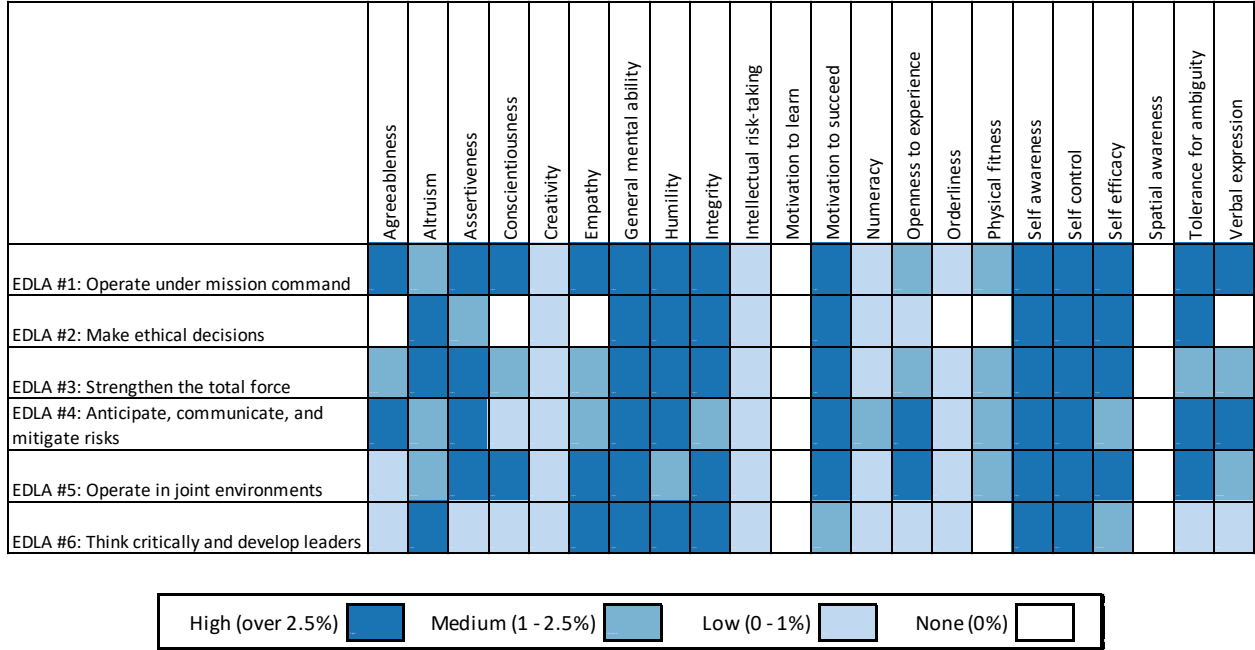


Figure E.3. Attribute Proximity to Joint Publication 1 Requirements

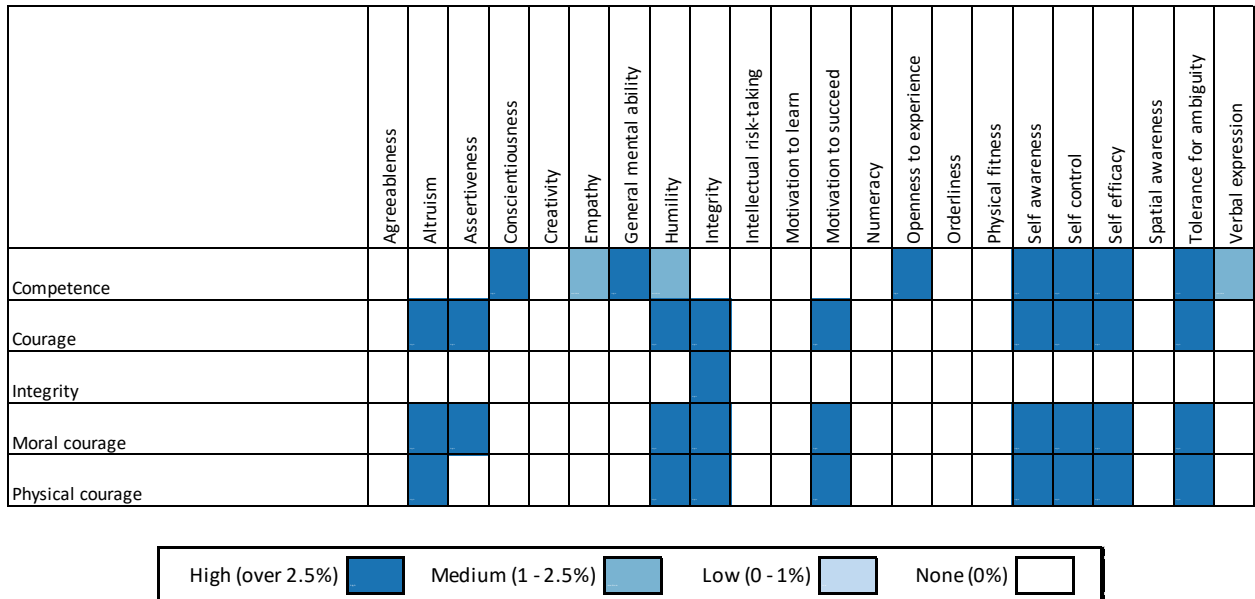


Figure E.4. Attribute Proximity to Joint Publication 3-0 Requirements

	Agreeableness	Altruism	Assertiveness	Conscientiousness	Creativity	Empathy	General mental ability	Humility	Integrity	Intellectual risk-taking	Motivation to learn	Motivation to succeed	Numeracy	Openness to experience	Orderliness	Physical fitness	Self awareness	Self control	Self efficacy	Spatial awareness	Tolerance for ambiguity	Verbal expression
Capacity to consider contrary views																						
Ethical leadership																						
Intuition																						
Judgment																						
Situational awareness																						



Figure E.5. Attribute Proximity to Strengthening Joint Leaders and Teams Gap Analysis Requirements

	Agreeableness	Altruism	Assertiveness	Conscientiousness	Creativity	Empathy	General mental ability	Humility	Integrity	Intellectual risk-taking	Motivation to learn	Motivation to succeed	Numeracy	Openness to experience	Orderliness	Physical fitness	Self awareness	Self control	Self efficacy	Spatial awareness	Tolerance for ambiguity	Verbal expression
Adaptive leadership	High	Medium	High	Medium	Low	High	High	High	Medium	Low	None	High	Medium	High	Medium	Medium	High	High	High	None	High	High
Credibility in joint context	None	Low	Low	High	None	High	High	Medium	High	None	None	High	None	High	Medium	None	High	High	High	None	High	Medium
Joint forces integration	None	None	None	None	Low	High	High	Medium	None	Low	None	High	Medium	High	None	None	High	High	High	None	High	Medium
Joint planning experience and processes	High	Medium	High	Medium	Low	Medium	High	High	Medium	Low	None	Medium	Medium	High	Medium	None	High	High	Medium	None	High	High
Knowledge of Air Force capabilities and doctrine	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Knowledge of command relationships	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Knowledge of joint culture	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Knowledge of sister-service capabilities and doctrine	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Motivation to succeed in joint environments	None	High	None	None	None	None	High	High	None	None	None	High	None	None	None	None	None	None	High	None	None	None
Operational mindset and artistry	None	None	None	None	Medium	High	Medium	Medium	None	Medium	None	Medium	Medium	Medium	None	None	High	Medium	Medium	None	Medium	None
Teamwork	High	High	High	High	Low	High	High	High	High	Low	None	High	Medium	High	Medium	Medium	High	High	High	None	High	High

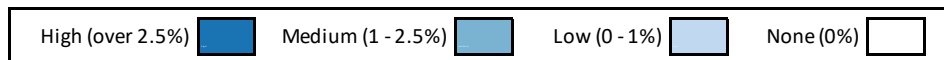


Figure E.6. Attribute Proximity to Strengthening Joint Leaders and Teams Flight Plan Requirements

	Agreeableness	Altruism	Assertiveness	Conscientiousness	Creativity	Empathy	General mental ability	Humility	Integrity	Intellectual risk-taking	Motivation to learn	Motivation to succeed	Numeracy	Openness to experience	Orderliness	Physical fitness	Self awareness	Self control	Self efficacy	Spatial awareness	Tolerance for ambiguity	Verbal expression
Battle management skills																						
Educated																						
Execute rapid decision-making in any type of conflict																						
Joint planning skills																						
Overall motivation																						
Solution-minded																						
Trained																						
Understand how to optimize joint capabilities across domains																						
Understand service and interagency cultures																						
Understand sister-service doctrine																						
Understanding of the land domain																						
Visualize multiple battlespaces																						



Figure E.7. Attribute Proximity to Joint Officer Handbook Requirements

	Agreeableness	Altruism	Assertiveness	Conscientiousness	Creativity	Empathy	General mental ability	Humility	Integrity	Intellectual risk-taking	Motivation to learn	Motivation to succeed	Numeracy	Openness to experience	Orderliness	Physical fitness	Self awareness	Self control	Self efficacy	Spatial awareness	Tolerance for ambiguity	Verbal expression
Build constructive work relationships	High	Low	High	High	None	High	High	High	High	None	None	Low	None	High	Low	None	High	High	High	None	High	High
Communicate effectively at executive levels and with diverse workforce	High	Low	High	Low	None	High	High	High	Low	None	None	Low	None	High	Low	None	High	High	High	None	High	High
Effectively manage and lead diverse workforce	Low	Low	High	Low	Low	High	High	High	Low	None	None	Low	Low	High	Low	Low	High	High	High	None	High	High
Effectively prepare, plan, and participate in joint exercises	None	None	None	None	Low	High	High	High	None	Low	None	Low	Low	High	None	None	High	High	High	None	High	Low
Exhibit excellent time management skills	None	None	None	High	Low	None	High	High	High	Low	None	Low	Low	High	Low	None	High	High	High	None	High	None
Exhibit joint and command-level mindset	Low	Low	High	High	Low	High	High	High	High	Low	None	Low	Low	High	Low	Low	High	High	High	None	High	Low
Knowledge of Air Force organization and capabilities	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Knowledge of Combatant Command authorities and legal requirements	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Knowledge of non-DOD agencies and their relationships with Combatant Commands	None	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	High	None	None	None	None	None
Maximize technology software and hardware capabilities	None	None	None	None	Low	None	High	High	None	Low	None	Low	Low	High	None	None	High	High	Low	None	Low	None
Practice lifelong learning behaviors	None	None	None	None	None	None	High	None	None	None	High	None	None	None	None	None	High	High	High	None	None	None
Problem-solving using strategic and critical thinking	None	None	None	None	Low	High	High	High	Low	Low	None	Low	Low	High	None	None	High	High	Low	None	Low	None
Understand and excel in joint staff officer roles	Low	Low	Low	Low	Low	High	High	High	Low	None	None	Low	Low	High	Low	Low	High	High	High	None	High	Low
Understand organization and missions of Combatant Commands	None	None	None	None	None	High	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Write, read, and conduct advanced-level research	High	Low	High	Low	Low	High	High	High	Low	None	None	Low	Low	High	Low	None	High	High	Low	None	Low	High



Appendix F. Analysis of Attributes by Dimension

In this appendix, we provide more detail about the attribute dimensions described in Chapter 5 of the main report and depicted there in Tables 5.2, 5.3, and 5.4. In particular, we focus on *relative stability or malleability* and *assessment tools and approaches* because these are areas in which there is often some degree of nuance. For the assessment tools listed, we denote whether there is an exact match with the attribute in question or a close match with related dimensions. Appendix B in the main report contains a full description of the ASVAB, AFOQT, TAPAS, and SDI. The proximity values for all attributes sum to 100 percent. Readers can use this appendix to learn more about each attribute and related literature sources.

Agreeableness

The dimensions of this attribute are as follows:

Proximity value: 1.2 percent (medium)

Relative stability or malleability: agreeableness is considered to be stable and is therefore unlikely to be developed via education or training (American Psychological Association, undated; Barrick and Mount, 1991; Digman, 1990; McCrae and Costa, 1994).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. It is one of the domains in the Revised NEO Personality Inventory ([NEO-PI-R], which measures five dimensions of personality) that comprises five facets: trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness (Costa and McCrae, 1992). It is also one of the domains in the HEXACO Personality Inventory ([HEXACO PI]; another popular instrument based on six dimensions of personality; Lee and Ashton, 2004), which comprises slightly different facets: forgiveness, gentleness, flexibility, and patience. Both NEO-PI-R and HEXACO PI are well-established tools with known validity. Women tend to score higher on agreeableness than men.

Alignment with Air Force foundational competencies: aligns with *relationship-building* and *teamwork*.

Altruism

The dimensions of this attribute are as follows:

Proximity value: 2.4 percent (medium)

Relative stability or malleability: altruism is considered to be stable (Costa, 1996; Diefendorff and Chandler, 2011; McCrae and Costa, 1994). It is a facet of the Big Five personality trait agreeableness (Diefendorff and Chandler, 2011).⁴

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. Altruism is measured as a facet of agreeableness in NEO-PI-R (Costa and McCrae, 1992). It does not have to be context-specific, but there are some gender differences. Research has shown that men might be more likely to pursue agency goals (i.e., power, achievement, new experiences), whereas women might be more likely to pursue communal goals (i.e., intimacy, affiliation, altruism) (Pöhlmann, 2001).

Alignment with Air Force foundational competencies: aligns with *service mindset*.

Assertiveness

The dimensions of this attribute are as follows:

Proximity value: 1.8 percent (medium)

Relative stability or malleability: assertiveness is considered relatively stable (Silzer and Church, 2009; Straus et al., 2018). Although assertiveness can be considered a Big Five factor for the trait extraversion (Chernyshenko, Stark, and Drasgow, 2011), Straus et al., 2018, notes that the social dominance facets of extraversion might be malleable and that, in limited research (Roberts, Walton, and Viechtbauer, 2006), extraversion was shown to have changed in young adults (e.g., ages 18–22). It is likely that more research needs to be done on age in relation to possible changes in assertiveness levels.

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS close match

Assessment tools and approaches: This trait is testable with validated tools. It is treated as a facet of extraversion in the NEO-PI-R (Costa and McCrae, 1992), HEXACO PI (Lee and Ashton, 2004), International Personality Item Pool (IPIP) (Goldberg et al., 2006), and Big Five Inventory (John and Srivastava, 1999) forms of the five-factor model of personality. At a behavioral level, Thompson and Berenbaum (2011) developed the Adaptive and Aggressive Assertiveness Scales (AAA-S) to differentiate between aggressive and adaptive assertive behavior (essentially, the degree to which assertiveness is harmful or productive).

Alignment with Air Force foundational competencies: aligns with *impact* and *influence*.

⁴ Several attributes described in this appendix are considered to be personality traits. Evidence shows that, for most people, personality is likely to remain stable over one's life span, although, for some, individual traits can mature over time (Damian et al., 2019).

Conscientiousness

The dimensions of this attribute are as follows:

Proximity value: 1.9 percent (medium)

Relative stability or malleability: as a Big Five personality trait, conscientiousness is considered stable (American Psychological Association, undated; Barrick and Mount, 1991; McCrae and Costa, 1994). Straus et al., 2018, notes that facets of conscientiousness might be somewhat malleable through experience.

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: Conscientiousness is testable with validated tools. This is one of the domains of NEO-PI-R (Costa and McCrae, 1992) and IPIP (Goldberg et al., 2006), and it has multiple facets. Conscientiousness is the most consistent personality predictor of job performance across multiple occupations and measures (Barrick and Mount, 1991).

There is an established body of literature showing that cognitive ability (intelligence) and conscientiousness represent two of the strongest psychoeducational predictors of performance, both at school and on the job (e.g., Barrick and Mount, 1991; Schmidt and Hunter, 2004). In military settings, average levels of conscientiousness and minimum conscientiousness levels have been shown to predict overall group performance (Halfhill, 2001). In addition to task performance, conscientiousness has been shown to positively predict adaptive performance, organizational citizenship behavior (e.g., helping out, going above and beyond), coping with negative emotions, and more. It has been shown to negatively predict counterproductive work behavior, absenteeism, and other factors. Regarding gender differences, women tend to average higher than men in conscientiousness scores, including in military samples (King et al., 2011).

Alignment with Air Force foundational competencies: aligns with *strategic thinking*, *resource management*, *initiative*, and *perseverance*.

Creativity

The dimensions of this attribute are as follows:

Proximity value: 0.6 percent (low)

Relative stability or malleability: varies; limited research shows that dispositional (i.e., a personality facet related to openness to experience) aspects of creativity are generally considered stable (McCrae and Costa, 1994; Straus et al., 2018). However, creative problem-solving (a set of behaviors associated with creativity) is something that can be developed (Straus et al., 2018).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This is a trait that is testable with validated tools.

Creativity is treated as a facet of openness to experience in HEXACO PI (Lee and Ashton, 2004) with a broad definition. Some other measures focus on more–narrowly targeted expressions of creativity. For example, the creative-ability portion of the Remote Associates Test (RAT) asks test-takers to find commonalities between three words to assess creativity in engineers.

Such tests as the RAT have a compendium of many test options at differing ability levels; however, its generalizability beyond the target group is unclear for assessing behavioral creativity. In addition, although some facets of creativity can be assessed at the individual level, organizational factors (e.g., the climate for creativity) are also important to consider with regard to fostering airmen’s creativity. Vego, 2013, discussed key issues related to creating an environment for military creativity.

Alignment with Air Force foundational competencies: aligns with *creative thinking* and *fosters innovation*.

Empathy

The dimensions of this attribute are as follows:

Proximity value: 1.9 percent (medium)

Relative stability or malleability: as a facet of emotional intelligence and not a personality trait, empathy is considered malleable (Teding van Berkhout and Malouff, 2016).

Empathy can wax or wane depending on such factors as work conditions (e.g., studies show how social stress can lead to a decrease in empathy; Nerdinger, 1994, as cited in Von Rosenstiel, 2011). Some research states that empathy can be developed through training and education (Erera, 1997; Klimecki et al., 2014; Teding van Berkhout and Malouff, 2016; Von Rosenstiel, 2011).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: There are limited assessment tools, and they might lack evidence for validity; examples are the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Mayer et al., 2003) and the Interpersonal Reactivity Index (Davis, 1983).

Alignment with Air Force foundational competencies: aligns with *teamwork*.

General Mental Ability

The dimensions of this attribute are as follows:

Proximity value: 40.0 percent (highest)

Relative stability or malleability: varies; fluid intelligence is considered stable. General mental ability includes “abilities that are most associated with working memory, abstract reasoning, attention, and processing new information—is largely normative in nature; it tends to peak in young adulthood and then decline gradually and monotonically through the remainder of life” (Straus et al., 2018, p. xiv).

Crystallized intelligence is considered moderately stable (Schmidt and Hunter, 2004; Straus et al., 2018). Crystallized intelligence includes “abilities associated with general experience, depth of vocabulary, and verbal comprehension—is amenable to change through education and experience, but development is gradual” (Straus et al., 2018, p. xiv).

Domain-specific knowledge, or knowledge gained through training or experience, is inherently malleable (Mueller-Hanson et al., 2005).

Current Air Force formal assessments: for officer accessions, AFOQT; for enlisted accessions, ASVAB

Assessment tools and approaches: General mental ability is testable with validated tools in education assessment. The tools are widely available, and there are plenty of commercial measures with known validity (e.g., the 12-minute Wonderlic Personnel Test) (Wonderlic and Hovland, 1939).

Of the established selection procedures, cognitive ability is widely considered the best predictor of job performance (Schmidt and Hunter, 2004). The main mechanism of cognitive ability is one’s ability to internalize and apply new information, which is also called *training transfer*. Cognitive ability affects job performance through job knowledge acquisition (Borman and Motowidlo, 1993). Individuals with high cognitive ability are better equipped to acquire the knowledge needed to perform their jobs at the highest levels. The predictive validity of cognitive ability also depends on the complexity of the job, with the strongest validity coefficients observed for highly complex jobs (Ones, Dilchert, and Viswesvaran, 2012).

Alignment with Air Force foundational competencies: aligns with *analytical thinking*, *creative thinking*, and *strategic thinking*.

Humility

The dimensions of this attribute are as follows:

Proximity value: 2.4 percent (medium)

Relative stability or malleability: humility is considered a stable trait (Lee and Ashton, 2004; Morris, Brotheridge, and Urbanski, 2005).

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, none

Assessment tools and approaches: This trait is testable with validated tools, such as the honesty and humility (HH) scale of the HEXACO PI-Revised (HEXACO PI-R), which assesses facets of sincerity, fairness, modesty, and greed avoidance. The Comprehensive Intellectual Humility Scale also assesses humility (Krumrei-Mancuso and Rouse, 2016). Hilbig, Heydasch, and Zettler, 2014, assessed modest behavior in terms of people’s over- or underrepresentations of their actual abilities. The study found that the HH scale and the modesty facet scale of the HEXACO PI-R (Lee and Ashton, 2004) predicted the degree to which participants’ self-appraisals matched their actual general mental ability in the expected direction: Those who were low in honesty–humility and/or modesty overstated their ability. In addition, HH is found to be inversely related to several unethical behaviors across contexts (Ashton and Lee, 2007).

Alignment with Air Force foundational competencies: Although the available literature suggests that humility is a key attribute of joint leaders (Taradash and Brown, 2015; Belote, 2000, p. 53), it is one of seven attributes that were not referenced in any of the foundational competencies. We adopted the following definition of *humility*: “the quality of being humble, characterized by a low focus on the self, an accurate (not over- or underestimated) sense of one’s accomplishments and worth, and an acknowledgment of one’s limitations, imperfections, mistakes, and gaps in knowledge” (American Psychological Association, undated). Although *service mindset* is listed as one of the Air Force’s foundational competencies, its definition reflects a focus on altruism rather than humility: “a desire to help or serve others to meet their needs; making and focusing efforts to discover and meet others’ needs.”

In the military context, humility is seen as critical for relationship-building, which, in turn, is necessary to effectively command. In his book *Team of Teams*, GEN Stanley McChrystal, the commander of Joint Special Operations Command from 2003 to 2008, suggests that good leaders are “humble gardeners” who, rather than trying to control every situation, have the humility to recognize the “inevitability of surprises and unknowns” and seek to foster an environment of open, two-way communication to achieve organizational goals (McChrystal et al., 2015, pp. 220–235). Similarly, former Chairman of the Joint Chiefs of Staff GEN Martin Dempsey cited humility as one of his top three leadership attributes, echoing the idea that a central aspect of leadership is building relationships, which requires humility. According to Dempsey, “if people question your motivation to lead—if they think you are leading for self-benefit—they will be suspicious and far less inclined to approach you” (Garamone, undated). There were several constructs in the joint development requirements that related to humility and reflect this emphasis on openness and emphasis on others, such as *actively open-minded thinking* and *selfless service*. These constructs were identified as contributing to several joint development requirements, such as adaptive leadership in the former case

(Department of the Air Force, undated) and ethical decisionmaking in the latter case (see DLA 5 in CJCSI 1800.01E, 2015; and EDLAs 2 and 3 in CJCSI 1805.01B, 2015).

Integrity

The dimensions of this attribute are as follows:

Proximity value: 4.1 percent (high)

Relative stability or malleability: integrity is generally considered stable because it is associated with such personality traits as conscientiousness and emotional stability (Chernyshenko, Stark, and Drasgow, 2011; Garavan, Carbery, and Rock, 2012). Some research has shown that attitudes about the perceived importance of integrity can vary by age (Krettenauer, Murua, and Jia, 2016). Limited research also provides evidence that integrity training might have short-term impacts but not long-term impacts (Van Montfort, Beck, and Twijnstra, 2013).

Current Air Force formal assessments: for officer accessions, SDI close match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. Integrity tests are a frequently used tool for selection. The HH scale of HEXACO PI-R (Lee and Ashton, 2004) is one example of such a test. The Hogan Personality Inventory Reliability scale is another (Hogan and Hogan, 2007).

Integrity tests often come in two forms: overt and personality-based. Overt integrity tests (also referred to as *clear-purpose tests*) are designed to directly measure attitudes relating to dishonest behavior. They make no attempt to disguise the purpose of the assessment; thus, they are easy to fake. In comparison, personality-based tests are more-widely used and come in different variations. For example, scenario-based measures of employee integrity have some demonstrated validity in terms of predictors of integrity-relevant outcomes in real-world settings (Becker, 2005). Observer reports of personality traits are also of practical utility in terms of providing valid information about the target person's personality that is not captured by self-reports (Lee et al., 2008). Mount, Barrick, and Strauss (1994) found that aggregating personality reports across self and observers substantially increased the validity of personality in predicting supervisor ratings of job performance.

Regarding the scoring of integrity tests, range restrictions (especially the level of integrity that might be considered undesirable) are unclear in the literature. This is because people with the least integrity generally do not get hired into positions where integrity might be assessed; therefore, they are not part of the sample pool most studied.

Alignment with Air Force foundational competencies: aligns with *accountability*.

Intellectual Risk-Taking

The dimensions of this attribute are as follows:

Proximity value: 0.6 percent (low)

Relative stability or malleability: the relative stability of risk-taking as an attribute is unclear. Risk-taking is associated with such personality traits as openness to experience (Barling, Christie, and Hopton, 2011). Risk-taking, in general, has been shown to change with age (Vroom and Pahl, 1971, in Jackson and Joshi, 2011).

Risk-taking in a creative or an intellectual context is closely linked to the socialization of norms and values. This implies that individuals who join the Air Force will likely enter with preset risk-taking characteristics (or levels). However, an airman's environment can influence their propensity for risk-taking; for example, professional environments can further socialize or affect risk-taking behaviors (Ridenour and Twale, 2005).

Current Air Force formal assessments: for officer accessions, SDI close match; for enlisted accessions, TAPAS close match

Assessment tools and approaches: There are limited assessment tools designed specifically for intellectual risk-taking. There are more tools developed for assessing risk-taking, and they are used for assessing intellectual risk-taking; however, these tools often lack evidence for validity. For example, Choice Dilemmas Questionnaire (CDQ) (Kogan and Wallach, 1964) has been widely used in risk-taking studies because of its ease of administration; however, it has been subject to considerable criticism (see Kamalanabhan, Sunder, and Vasanthi, 2000, for a review). The General Risk Propensity Scale (GRiPS) (Zhang, Highhouse, and Nye, 2019) is a recently developed scale that examines the nature of risk-taking as a general personality disposition. The developers of this test have demonstrated its validity, but more replication studies should be done to further assess the reliability and validity of this scale.

Mata et al., 2011, looked into age-related intellectual risk-taking behaviors and how they vary as a function of task characteristics: in particular, the learning requirements of the task. The authors differentiated two types of decisions—those from experience and those from description—depending on whether one could rely on a priori information.

Decisions from experience provide no explicit information about probabilities of decisionmaking, and individuals must rely on experience acquired through feedback. In comparison, people's choices between gambles and lotteries in which full information about probabilities and outcomes is provided are examples of decisions from description. Mata et al., 2011, found that in decisions from experience, age-related differences in risk-taking were a function of decreased learning performance: Older adults were more risk-seeking than younger adults when learning led to risk-avoidant behavior but were more risk-averse when learning led to risk-seeking behavior. In decisions from description, younger adults and older adults showed similar risk-taking behavior for the majority of

the tasks, and there were no clear age-related differences as a function of gain or loss framing.

Notably, using the term *risk-taking* might lead to gender differences or biases because socialization by gender gives girls fewer opportunities to take risks during upbringing, according to Ridenour and Twale, 2005. In general, girls tend to be conditioned to conform more than boys. However, focusing on ideas and mental exploration might help mitigate this discrepancy.

Alignment with Air Force foundational competencies: aligns with *creative thinking* and *fosters innovation*.

Motivation to Learn

The dimensions of this attribute are as follows:

Proximity value: 2.2 percent (medium)

Relative stability or malleability: motivation to learn is considered moderately stable. It is closely related to personality factors, such as conscientiousness, that are relatively stable (Major, Turner, and Fletcher, 2006). Likewise, aspects of intrinsic motivation, which relate to one's core values, are considered relatively stable (Diefendorff and Chandler, 2011).

However, contextual factors matter (Colquitt, LePine, and Noe, 2000; Major, Turner, and Fletcher, 2006; Pintrich, 2000). Major, Turner, and Fletcher, 2006, states:

Motivation to learn encompasses the desire to engage in training and development activities, to learn training content, and to embrace the training experience. . . . Because one's motivation toward learning is an indication of desire and willingness to exert effort toward training and development, extant research and theory treat it as a state that is influenced by both individual characteristics and contextual factors. . . . Personality variables are relatively more enduring, stable, individual characteristics that indicate general tendencies and predispositions. (p. 927)

From an attribute-oriented perspective, this means that it is likely that some individuals will be more predisposed than others to taking advantage of learning opportunities (Major, Turner, and Fletcher, 2006).

Research on learning goal orientation (LGO) scales (Button, Mathieu, and Zajac, 1996) and achievement goal frameworks (Elliot and McGregor, 2001) is related to this attribute.

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, TAPAS close match

Assessment tools and approaches: This is an attitudinal attribute that is testable. For example, NEO-PI-R's Conscientiousness Scale has a facet called *achievement striving* (Costa and McCrae, 1992). Other tools exist, such as Vandewalle's Performance Goal Orientation Scale (Vandewalle and Cummings, 1997) and Button, Mathieu, and Zajac's

1996 LGO scale; however, most of these tools lack measurement precision or have internal consistency problems. There is also a three-item measure (Colquitt and Simmering, 1998) and the Achievement Goal Framework (Elliot and McGregor, 2001), but these tools are less popular and lack evidence of validity.

Alignment with Air Force foundational competencies: aligns with *information-seeking*.

Motivation to Succeed

The dimensions of this attribute are as follows:

Proximity value: 5.1 percent (high)

Relative stability or malleability: motivation to succeed is moderately stable. This attribute is related to the concept of goal orientation, which itself has been linked to relatively stable traits, such as conscientiousness, high achievement orientation, and high self-esteem (Stevens and Gist, 1997).

Context also plays a role regarding motivation to succeed. As with motivation to learn, some aspects of motivation, in general, can be intrinsic and, therefore, somewhat stable or extrinsic and, therefore, malleable. According to Amabile et al., 1994, “*intrinsic motivation* [is] the motivation to engage in work primarily for its own sake, because the work itself is interesting, engaging, or in some way satisfying,” whereas “*extrinsic motivation* [is] the motivation to work primarily in response to something apart from the work itself, such as reward or recognition or the dictates of other people” (p. 950; emphasis in original).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This is an attitudinal attribute that is testable but with limited tools. For example, the LGO scale (Button, Mathieu, and Zajac, 1996) captures the learning aspect of different types of goals. For performance types of goals, the Work Preference Inventory (Amabile et al., 1994) captures different types of motivation, including intrinsic motivation (self-determination, competence, task involvement, curiosity, enjoyment, and interest) and extrinsic motivation (concerns with competition, evaluation, recognition, money or other tangible incentives, and constraint by others). In the military setting, Wrzesniewski et al., 2014, looked at whether multiple motives would be more powerful and effective than a single motive among West Point cadets. The authors found that motivation internal to military service itself predicted positive outcomes. On the other hand, instrumental motives, which are extrinsic to the activities at hand, can weaken internal motives, which are intrinsic to the activities at hand.

Alignment with Air Force foundational competencies: aligns with *results-focused*.

Numeracy

The dimensions of this attribute are as follows:

Proximity value: 0.3 percent (lowest)

Relative stability or malleability: in general, numeracy is considered malleable, although some aspects of general mental ability, particularly fluid intelligence, are considered stable and might influence one's ability to be numerate.

Current Air Force formal assessments: for officer accessions, AFOQT; for enlisted accessions, ASVAB

Assessment tools and approaches: Numeracy is testable with validated tools in education assessment. The tools are widely available, and there are plenty of commercial measures with known validity. In the context of adult basic education, the mathematical components of standardized tests, such as the Test of Adult Basic Education (TABE) (CTB/McGraw-Hill, 2003) and the Comprehensive Adult Student Assessment System (CASAS), 2001, are used to measure educational gain so as to provide quality numeracy instruction to adults to help them achieve the mathematical knowledge and skills that will enable them to adjust to this growing societal demand.

According to McDevitt (2001), *numeracy* has been defined as the “kinds of math skills needed to function in everyday life—not one fixed set of skills but rather a continuum of skills that an adult draws from to meet different needs. [It is] numeracy that we want for our learners, not just math.” CASAS emphasizes dealing with such real-world situations as workplace, community, or family tasks, all of which might involve the activation of multiple skills.

In a review of the literature on adult numeracy, Condelli et al., 2006, noted that TABE is skill-based, whereas CASAS is competency-based. On the one hand, research on everyday mathematics suggests that the transfer of school or decontextualized learning is difficult. On the other hand, the demonstration of competencies in a functional context might be domain-specific (Strasser, 2003), and learners might not have more-generalizable skills.

Alignment with Air Force foundational competencies: Numeracy is one of seven attributes that were not referenced in any of the foundational competencies. We found that being comfortable with numbers and having the ability to understand and work with numbers, contribute to joint development requirements that involve the assessment of risk—a critical skill for the military profession.⁵ Assessing risk in a military context is not strictly a quantitative exercise; strategic decisions under uncertainty could involve

⁵ Two aspects of our working definition of *probabilistic thinking* are being comfortable with numbers (Tetlock and Gardner, 2015, p. 191) and having the ability to understand and work with numbers (Oxford English Dictionary, undated-e). The chairman of the Joint Chiefs of Staff is intimately involved in risk assessment at the strategic level. See CJCSI 3105.01, 2016.

“value-laden choices full of unpredictable variables, nonlinear dynamics, and human factors on which no optimal answer will be available” (Mazarr, 2015). That said, a significant body of research suggests that people willing to view the world quantitatively—in “testable, probabilistic propositions” (Mellers et al., 2019, p. 6)—can make “explicit probability assessments that are empirically justifiable, even in domains as complex as world politics” (Friedman et al., 2018, p. 410). Furthermore, these probabilistic assessments might increase the accuracy of risk assessments above and beyond qualitative assessments (Friedman et al., 2018).

Openness to Experience

The dimensions of this attribute are as follows:

Proximity value: 3.8 percent (high)

Relative stability or malleability: Openness to experience is considered to be a stable personality trait (McCrae and Costa, 1994; Mueller-Hanson et al., 2005; Straus et al., 2018).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. The openness to experience domain in NEO-PI-R (Costa and McCrae, 1992) comprises six facets: fantasy, aesthetics, feelings, actions, ideas, and values. The openness to experience dimension in HEXACO PI (Lee and Ashton, 2004) comprises aesthetic, appreciation, inquisitiveness, creativity, and unconventionality. Both NEO-PI-R and HEXACO PI are well-established tools with known validity.

Alignment with Air Force foundational competencies: aligns with *fosters innovation* and *information-seeking*.

Orderliness

The dimensions of this attribute are as follows:

Proximity value: 0.1 percent (lowest)

Relative stability or malleability: orderliness is considered to be a facet of conscientiousness and is therefore presumed to be stable (Chernyshenko, Stark, and Drasgow, 2011).

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: Orderliness is a facet of the conscientiousness domain in NEO-PI-R (Costa and McCrae, 1992). It is related to the organization facet of the conscientiousness domain in HEXACO PI (Lee and Ashton, 2004). Both NEO-PI-R and

HEXACO PI are well-established tools with known validity. It is worth noting that any attribute in the extreme likely would be problematic; in the case of orderliness, extreme examples of traits might include *workaholic*, *perfectionist*, or *compulsive behavior* (Carter et al., 2016).

Alignment with Air Force foundational competencies: aligns with *precision*.

Physical Fitness

The dimensions of this attribute are as follows:

Proximity value: 0.4 percent (low)

Relative stability or malleability: physical fitness is considered to be extremely malleable (Straus et al., 2018). All things equal, fitness can be developed relatively easily. Basic training is a good example of fitness development.

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. Physical fitness tests must be both job-related and consistent with business necessity. There are many commercial profession-specific tests, such as those for police departments and fire departments. In common job-related settings, if a physical examination is a medical exam, it may be conducted only after a job offer is made. If it is not part of a medical exam, the employer might require applicants to take a physical test either before or after extending a job offer. Even where physical tests are not part of a medical exam, employers should be cautious in conducting any test that might have a disparate impact on a protected class of individuals.

Alignment with Air Force foundational competencies: Physical fitness may be required to take effective action and make decisions and is an attribute that is relevant to a variety of joint development requirements, including several of the chairman's DLAs for both enlisted personnel and officers. However, the absence of an explicit reference to physical fitness in the Air Force's foundational competencies is probably not an indication that the Air Force is overlooking this attribute. Because physical fitness is so fundamental to military service, as evidenced by physical fitness and medical requirements for new recruits and for service members over the courses of their careers, it might not be necessary to highlight this attribute in the Air Force's foundational competencies.

Self-Awareness

The dimensions of this attribute are as follows:

Proximity value: 14.6 percent (highest)

Relative stability or malleability: in general, self-awareness is considered malleable and can be developed (Sutton, 2016; Sutton, Allinson, and Williams, 2013). However, some dispositional facets of self-awareness might be harder to change. Conclusive research on how to develop self-awareness seems lacking. According to Feize and Faver, 2019, p. 162, “[t]he process of developing self-awareness has seldom been explored.” That said, applied research on such topics as leadership, education (Taylor and Cheung, 2010, in Feize and Faver, 2019), and social work (Feize and Faver, 2019) refers to the benefits of self-awareness or attempts to help individuals develop self-awareness for various ends. Broadly, self-awareness contributes to interpersonal skills that, in turn, support effective leadership (Mueller-Hanson et al., 2005; Tekleab et al., 2008). Having good self-awareness means that there is alignment between one’s identity and one’s reputation; in contrast, leaders with poor self-awareness tend to view themselves in ways that do not align with views of organizational members (Hogan and Warrenfeltz, 2003; Tekleab et al., 2008).

Self-awareness definitions can vary. *Situational self-awareness* is “an automatic process by which we compare our current actions to our internalized standards [and] make changes where necessary to reduce inconsistency” (Silvia and Duval, 2001; quoted in Sutton, 2016, p. 646), whereas *dispositional self-awareness* “is the trait-like tendency for an individual to focus on and reflect on their own psychological processes and inner experiences as well as their relationships to others” (Fenigstein, Scheier, and Buss, 1975; quoted in Sutton, 2016, p. 646).

Additionally, dispositional self-awareness can be further divided into public and private self-consciousness, where *public self-consciousness* is “an awareness of how one appears to others” and *private self-consciousness* is “awareness of and reflecting on one’s internal states” (Sutton, 2016, p. 646).

Some dispositional facets of self-awareness have been connected to personality traits; for example, Trapnell and Campbell, 1999, as cited in Sutton, 2016, argues that *rumination* (a negative form of self-awareness) is connected to *neuroticism*, and *reflection* (a more-positive form of self-awareness) is connected to *openness to experience*.

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, TAPAS close match

Assessment tools and approaches: This is a trait with limited assessment tools. The self-consciousness scale comprises three components of self-consciousness: public, private, and social anxiety (Fenigstein, Scheier, and Buss, 1975). In their study, the authors found that, despite the everyday stereotypes suggesting that women are more self-conscious than men, particularly with respect to their public self-consciousness, the data indicate no gender difference on any of the three dimensions. The findings also suggest that self-awareness does not automatically imply social anxiety; a person might focus their attention on themselves without experiencing discomfort.

Alignment with Air Force foundational competencies: Self-awareness might be an important attribute for the Air Force to consider during recruiting and accession. Self-awareness contributes to interpersonal competencies, which are seen as critical for joint leaders (Belote, 2000; Markel et al., 2011, p. xv). We identified self-awareness as a contributor to a variety of joint development requirements related to interpersonal skills, such as *building constructive work relationships*⁶ and *teamwork*.⁷

Self-Control

The dimensions of this attribute are as follows:

Proximity value: 5.6 percent (high)

Relative stability or malleability: self-control is a facet of conscientiousness (Chernyshenko, Stark, and Drasgow, 2011; Digman, 1990; Straus et al., 2018) and so is considered to be stable.

Current Air Force formal assessments: for officer accessions, SDI exact match; for enlisted accessions, TAPAS exact match

Assessment tools and approaches: This trait is testable with validated tools. Self-control is related to the self-discipline facet of the conscientiousness domain in NEO-PI-R (Costa and McCrae, 1992). It also is related to the prudence facet of the conscientiousness domain in HEXACO PI (Lee and Ashton, 2004). Both NEO-PI-R and HEXACO PI are well-established tools with known validity.

Similar to self-regulation, *self-control of emotions* specifically can be found in emotional intelligence scales, such as version 2.0 of the MSCEIT (Mayer et al., 2003). The MSCEIT includes four bunches of emotional intelligence: perceiving emotions, facilitating thought, understanding emotions, and managing emotions. Self-control is most related to managing emotions (i.e., the ability to be open to feelings and to modulate them in oneself and others so as to promote personal understanding and growth).

Alignment with Air Force foundational competencies: aligns with *self-control*.

Self-Efficacy

The dimensions of this attribute are as follows:

Proximity value: 4.5 percent (high)

Relative stability or malleability: general self-efficacy (GSE) historically has been considered a relatively stable personality-like trait (Bandura, 1971; Smith, 1989; Straus et al., 2018). However, Straus et al., 2018, states that GSE can be malleable or dynamic; for

⁶ This requirement appears in Joint Staff J-7, 2011, p. 77.

⁷ This requirement appears in Department of the Air Force, undated.

example, self-efficacy can be developed in relation to specific tasks or domains, which can influence one's self-efficacy in other domains (Chen, Gully, and Eden, 2001, in Straus et al., 2018).

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, none

Assessment tools and approaches: This is a trait with limited assessment tools. Compared with *self-esteem*, which usually refers to overall evaluation of oneself, GSE is one's estimate of one's fundamental ability to cope, perform, and be successful. Sherer et al.'s (1982) General Self-Efficacy Scale is a legacy scale for measuring self-efficacy. Chen, Gully, and Eden, 2001, developed a new GSE (NGSE) scale and compared its psychometric properties and validity with the old GSE scale. They found that the NGSE scale, which is shorter than the GSE scale, has higher construct validity than the GSE scale.

GSE enables individuals to adapt effectively to novel and adverse environments (e.g., during training, socialization, and organizational change) (Judge et al., 1999; Pulakos et al., 2000). Its role in work motivation, however, needs further research in different settings.

Alignment with Air Force foundational competencies: Self-efficacy is one of seven attributes that are not referenced in the list of foundational competencies, although an early version of the list included *self-confidence*, which was later updated to *self-efficacy*, and then that term was dropped from the list. (We were not informed of the reason the term was dropped.) *Self-confidence* is a less precise term that refers to a person's trust in themselves in terms of their resources, abilities, or strengths, while *self-efficacy* refers to a person's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances.

Spatial Awareness

The dimensions of this attribute are as follows:

Proximity value: 1.7 percent (medium)

Relative stability or malleability: Buckley, Seery, and Canty, 2018, positions spatial awareness as being linked to intelligence; thus, in general, spatial awareness is not considered to be very malleable. That said, occupational therapy practice and literature shows how spatial awareness can be developed or compensated for among children and adults. It is unclear whether, or to what extent, spatial awareness in general or more-abstract spatial awareness tasks (such as imagining multiple battlefields) can be developed in an Air Force context.

Spatial awareness is often discussed in the context of physiological and cognitive abilities related to how individuals develop awareness of themselves in space. According to

Eckersley, 2012, “spatial awareness also involves understanding the relationship of these objects when there is a change of position. It can therefore be said that the awareness of spatial relationships is the ability to see and understand two or more objects in relation to each other and to oneself.”

A related term, *spatial perception*, is one’s “cognitive ability [in] that it allows us the ability to perceive our surroundings with shapes, sizes, distances, etc. Thanks to spatial perception, we can mentally reproduce objects in both 2D and 3D, and anticipate the changes in space” (CogniFit, undated). Similarly, *spatial representation* is the “level of mental representation devoted to encoding the geometric properties of objects in the world and the spatial relationships among them” (Landau and Jackendoff, 1993, p. 217).

Current Air Force formal assessments: for officer accessions, AFOQT; for enlisted accessions, ASVAB

Assessment tools and approaches: This trait is testable with validated tools. Typical tasks on the test would be manipulating 2D and 3D images that involve mirror images, manipulating 3D cubes, and matching similar types of shapes. The cognitive tests used to measure spatial visualization ability include mental rotation tasks, such as the Mental Rotations Test (MRT) (Vandenberg and Kuse, 1978), or mental cutting tasks, such as the Mental Cutting Test (Fay and Quaiser-Pohl, 1999). The Minnesota Paper Form Board Test (Quasha and Likert, 1937) uses geometric shapes to assess the candidate’s mechanical-spatial abilities (e.g., giving participants a shape and a set of smaller shapes; the participants are instructed to determine which combination of small shapes will fill the larger shape completely without overlapping).

Alignment with Air Force competencies: Spatial awareness appears to be an important attribute for joint participation in the view of the Air Force. The service’s strengthening joint leaders and teams research identified a total of three requirements for airmen that deconstructed to spatial awareness, including *skills for battle management*, the ability to *visualize multiple battlespaces*, and *better understanding of how to optimize joint capabilities across multiple domains* (Saltzman and the Air Force Strategic Integration Group, 2018).

Tolerance for Ambiguity

The dimensions of this attribute are as follows:

Proximity value: 3.5 percent (high)

Relative stability or malleability: unknown/inconclusive; *tolerance for ambiguity* is “the tendency to perceive ambiguous situations as desirable” (Budner, 1962, p. 29). Although some research treats tolerance for ambiguity as a relatively stable personality-like trait, literature in this area is scattered and imprecise (Endres, Camp, and Milner, 2015). In the past, tolerance for ambiguity has been studied as an individual’s attitude, but more-recent

research tends to treat it as a dispositional trait (Endres, Camp, and Milner, 2015; Mueller-Hanson et al., 2005; Zaccaro et al., 2009). Despite the existence of tests for this construct, evidence of test validity seems to be mixed.

Current Air Force formal assessments: for officer accessions, none; for enlisted accessions, none

Assessment tools and approaches: This is a trait with limited assessment tools designed for specific contexts or based on specific definitions. Several tools also have not been extensively validated.

Research on global leadership, expatriate adjustment and performance, and adaptive performance suggests that tolerance for ambiguity is positively related to performance in the global work environment and in cross-cultural settings (Jokinen, 2005; Yamazaki and Kayes, 2004). The Tolerance for Ambiguity Scale was developed for assessment in such cross-cultural contexts—for example, predicting expatriate and global leader performance (Herman et al., 2010). Four dimensions are represented in the scale: (1) valuing diverse others, (2) coping with change, (3) dealing with unfamiliar situations, and (4) unfamiliarity.

The Multiple Stimulus Types Ambiguity Tolerance–II scale (MSTAT-II) (McLain, 2009) is another example that is based on the definition of *ambiguity tolerance* as an orientation, ranging from aversion to attraction, toward stimuli that are complex, unfamiliar, and insoluble. McLain’s findings suggest that (1) ambiguity tolerance is a trait describing the individual’s general aversion or attraction to perceived ambiguity, and (2) ambiguity tolerance is related to orientations toward other forms of perceived information inadequacy, such as risk and uncertainty.

Alignment with Air Force competencies: aligns with *flexibility*.

Verbal Expression

The dimensions of this attribute are as follows:

Proximity value: 1.1 percent (medium)

Relative stability or malleability: in general, verbal expression is malleable because communication skills can be developed to a great extent (Mueller-Hanson et al., 2005). Some aspects of general mental ability (fluid intelligence) or certain aspects of personality might affect how, or the extent to which, an individual develops verbal expression (Schmidt and Hunter, 2004).

Related literature on communication competence points to how both behaviors (or skills) and cognitive traits affect one’s communication competence. Zaccaro et al., 2009, describes communication competence as a social attribute. *Communication competence* can be defined as

the effectiveness and appropriateness with which individuals use communication skills in a specific context like the workplace. Although there are multiple perspectives for defining communication competence, most assume that skills like message production, listening, interaction management, and situational awareness are constituent of the construct. Individuals who are able to develop multiple strategies for enacting these general skills are typically higher in communication competence, which can promote job satisfaction, reduced conflict with others, greater efficiency in accomplishing work tasks, and other positive outcomes (Titsworth and Okamoto, 2017).

Current Air Force formal assessments: for officer accessions, AFOQT; for enlisted accessions, ASVAB

Assessment tools and approaches: This trait is testable with validated tools. In the educational testing industry, there are many commercial instruments to assess verbal reasoning, such as the verbal scales in the Wechsler Adult Intelligence Scale (Pearson, undated) and the Fifth-Edition Verbal Comprehension Factor in the Stanford-Binet Intelligence Scales (Roid and Barram, 2004).

As a general rule, verbal expression should not be context-specific, but use of verbal ability or demonstration (e.g., being articulate) could be context-specific (e.g., talking to a friend versus a supervisor). It is realistic verbal expression to assess upon entry into the Air Force and it is possible to train airmen in terminology, interpersonal communication skills, and public speaking skills in military settings.

Verbal expression might be more or less relevant depending on one's role: For example, it would be important for those with communication-focused tasks (e.g., those responsible for public speaking or testifying before Congress).

Alignment with Air Force foundational competencies: aligns with *communication*.

References

- Amabile, Teresa M., Karl G. Hill, Beth A. Hennessey, and Elizabeth M. Tighe, "The Work Preference Inventory: Assessing Intrinsic and Extrinsic Motivational Orientations," *Journal of Personality and Social Psychology*, Vol. 66, No. 5, May 1994, pp. 950–967.
- American Psychological Association, "APA Dictionary of Psychology," webpage, undated. As of October 28, 2019:
<https://dictionary.apa.org>
- Ames, Daniel, "Pushing up to a Point: Assertiveness and Effectiveness in Leadership and Interpersonal Dynamics," *Research in Organizational Behavior*, Vol. 29, August 2009, pp. 111–133.
- Ashton, Michael C., and Kibeom Lee, "Empirical, Theoretical, and Practical Advantages of the HEXACO Model of Personality Structure," *Personality and Social Psychology Review*, Vol. 11, No. 2, May 2007, pp. 150–166.
- Bandura, Albert, *Social Learning Theory*, New York, N.Y.: General Learning Press, 1971.
- Bandura, Albert, *Social Foundations of Thought and Action: A Social Cognitive Theory*, Englewood Cliffs, N.J.: Prentice Hall, 1986.
- Barling, Julian, Amy Christie, and Colette Hopton, "Leadership," in Sheldon Zedeck, ed., *APA Handbook of Industrial and Organizational Psychology*, Vol. 1, *Building and Developing the Organization*, Washington, D.C.: American Psychological Association, 2011.
- Barrick, Murray R., and Michael K. Mount, "The Big Five Personality Dimensions and Job Performance: A Meta-Analysis," *Personnel Psychology*, Vol. 44, No. 1, March 1991, pp. 1–26.
- Baumeister, Roy F., Kathleen D. Vohs, and Dianne M. Tice, "The Strength Model of Self-Control," *Current Directions in Psychological Science*, Vol. 16, No. 6, December 2007, pp. 351–355.
- Becker, Thomas E., "Development and Validation of a Situational Judgment Test of Employee Integrity," *International Journal of Selection and Assessment*, Vol. 13, No. 3, September 2005, pp. 225–232.
- Belote, Howard D., *Once in a Blue Moon: Airmen in Theater Command: Lauris Norstad, Albrecht Kesselring, and Their Relevance to the Twenty-First Century Air Force*, Montgomery, Ala.: Maxwell Air Force Base, Air University Press, July 2000.

- Borman, Walter C., and S. M. Motowidlo, "Expanding the Criterion Domain to Include Elements of Contextual Performance," in Neal Schmitt and Walter C. Borman, eds., *Personnel Selection in Organizations*, New York: Jossey-Bass, 1993, pp. 71–98.
- Buckley, Jeffrey, Niall Seery, and Donal Canty, "A Heuristic Framework of Spatial Ability: A Review and Synthesis of Spatial Factor Literature to Support Its Translation into STEM Education," *Educational Psychology Review*, Vol. 30, No. 3, September 2018, pp. 947–972.
- Budner, Stanley, "Intolerance of Ambiguity as a Personality Variable," *Journal of Personality*, Vol. 30, No. 1, March 1962, pp. 29–50.
- Button, Scott B., John E. Mathieu, and Dennis M. Zajac, "Goal Orientation in Organizational Research: A Conceptual and Empirical Foundation," *Organizational Behavior and Human Decision Processes*, Vol. 67, No. 1, July 1996, pp. 26–48.
- Byron, Kevin, "Creative Problem-Solving," workshop notes, March 2006. As of September 23, 2019:
https://www.ttu.ee/public/i/infotehnoloogia-teaduskond/Instituudid/biorobootika/Byron_Creative_Problem_Solving.pdf
- Carter, Nathan T., Li Guan, Jessica L. Maples, Rachel L. Williamson, and Joshua D. Miller, "The Downsides of Extreme Conscientiousness for Psychological Well-Being: The Role of Obsessive Compulsive Tendencies," *Journal of Personality*, Vol. 84, No. 4, August 2016, pp. 510–522.
- Chairman of the Joint Chiefs of Staff Instruction 1800.01E, *Officer Professional Military Education Policy*, Washington, D.C.: U.S. Department of Defense, 2019.
- Chairman of the Joint Chiefs of Staff Instruction 1805.01B, *Enlisted Professional Military Education Policy*, Washington, D.C.: U.S. Department of Defense, May 15, 2015.
- Chairman of the Joint Chiefs of Staff Instruction 3105.01, *Joint Risk Analysis*, Washington, D.C.: U.S. Department of Defense, October 14, 2016, updated September 5, 2019.
- Chairman of the Joint Chiefs of Staff Instruction 3405.01, *Chairman's Total Force Fitness Framework*, Washington, D.C.: U.S. Department of Defense, September 1, 2011, updated September 23, 2013.
- Chen, Gilad, Stanley M. Gully, and Dov Eden, "Validation of a New General Self-Efficacy Scale," *Organizational Research Methods*, Vol. 4, No. 1, January 2001, pp. 62–83.
- Chernyshenko, Oleksandr S., Stephen Stark, and Fritz Drasgow, "Individual Differences: Their Measurement and Validity," in Stanley Zedeck, ed., *APA Handbook of Industrial and Organizational Psychology*, Vol. 2, *Selecting and Developing Members for the Organization*, Washington, D.C.: American Psychological Association, 2011, pp. 117–151.

CJCSI—See Chairman of the Joint Chiefs of Staff Instruction.

CogniFit, “Spatial Perception,” webpage, undated. As of September 28, 2019:

<https://www.cognifit.com/science/cognitive-skills/spatial-perception>

Colquitt, Jason A., Jeffrey A. LePine, and Raymond A. Noe, “Toward an Integrative Theory of Training Motivation: A Meta-Analytic Path Analysis of 20 Years of Research,” *Journal of Applied Psychology*, Vol. 85, No. 5, October 2000, pp. 678–707.

Colquitt, Jason A., Brent A. Scott, and Jeffery A. LePine, “Trust, Trustworthiness, and Trust Propensity: A Meta-Analytic Test of Their Unique Relationships with Risk Taking and Job Performance,” *Journal of Applied Psychology*, Vol. 92, No. 4, 2007, pp. 909–927.

Colquitt, Jason A., and Marcia J. Simmering, “Conscientiousness, Goal Orientation, and Motivation to Learn During the Learning Process: A Longitudinal Study,” *Journal of Applied Psychology*, Vol. 83, No. 4, 1998, pp. 654–665.

Comprehensive Adult Student Assessment System, *CASAS Technical Manual*, San Diego, Calif., 2001.

Condelli, Larry, Kathy Safford-Ramus, Renee Sherman, Diana Coben, Iddo Gal, and Anestine Hector-Mason, *A Review of the Literature in Adult Numeracy: Research and Conceptual Issues*, Washington, D.C.: American Institutes for Research, March 27, 2006.

Costa, Paul T., Jr., “Work and Personality: Use of the NEO-PI-R in Industrial/Organisational Psychology,” *Applied Psychology: An International Review*, Vol. 45, No. 3, July 1996, pp. 225–241.

Costa, Paul T., Jr., and Robert R. McCrae, *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*, Odessa, Fla.: Psychological Assessment Resources, 1992.

CTB/McGraw-Hill, *Tests of Adult Basic Education (TABE): Norms Book (Forms 9 and 10)*, Monterey, Calif., 2003.

Curtis E. LeMay Center for Doctrine Development and Education, *Volume 2 Leadership*, Washington, D.C.: U.S. Department of the Air Force, August 8, 2015.

Damian, Rodica Ioana, Marion Spengler, Andreea Sutu, and Brent W. Roberts, “Sixteen Going on Sixty-Six: A Longitudinal Study of Personality Stability and Change Across 50 Years,” *Journal of Personality and Social Psychology*, Vol. 117, No. 3, September 2019, pp. 674–695.

Davis, Mark H., “Measuring Individual Differences in Empathy: Evidence for a Multidimensional Approach,” *Journal of Personality and Social Psychology*, Vol. 44, No. 1, 1983, pp. 113–126.

- DeAngelis, Tori, "In Search of Cultural Competence," *Monitor on Psychology*, Vol. 46, No. 3, March 2015.
- Department of the Air Force, "Strengthening Joint Leaders and Teams, Gap Analysis," undated, Not available to the general public.
- Dictionary.com, "Creativity," webpage, undated. As of September 25, 2019:
<https://www.dictionary.com/browse/creativity>
- Diefendorff, James M., and Megan M. Chandler, "Motivating Employees," in Stanley Zedeck, ed., *APA Handbook of Industrial and Organizational Psychology*, Vol. 3, *Maintaining, Expanding, and Contracting the Organization*, Washington, D.C.: American Psychological Association, 2011.
- Digman, John M., "Personality Structure: Emergence of the Five-Factor Model," *Annual Review of Psychology*, Vol. 41, 1990, pp. 417–440.
- DoD—See U.S. Department of Defense.
- Duckworth, Angela, and James J. Gross, "Self-Control and Grit: Related but Separable Determinants of Success," *Current Directions in Psychological Science*, Vol. 23, No. 5, 2014, pp. 319–325.
- Dweck, Carol S., "Motivational Processes Affecting Learning," *American Psychologist*, Vol. 41, No. 10, 1986, pp. 1040–1048.
- Eckersley, Sian, "Occupational Therapy for Children: Spatial Awareness," *Overblog*, August 4, 2012. As of September 28, 2019:
<http://occupationaltherapyforchildren.over-blog.com/article-spatial-awareness-108726104.html>
- Elliot, Andrew J., and Holly A. McGregor, "A 2 x 2 Achievement Goal Framework," *Journal of Personality and Social Psychology*, Vol. 80, No. 3, March 2001, pp. 501–519.
- Endres, Megan L., Richaard Camp, and Morgan Milner, "Is Ambiguity Tolerance Malleable? Experimental Evidence with Potential Implications for Future Research," *Frontiers in Psychology*, Vol. 6, No. 619, May 2015.
- Endsley, Mica R., "Toward a Theory of Situation Awareness in Dynamic Systems," *Human Factors Journal*, Vol. 37, No. 1, March 1995, pp. 32–64.
- Erera, Pauline I., "Empathy Training for Helping Professionals: Model and Evaluation," *Journal of Social Work Education*, Vol. 33, No. 2, 1997, pp. 245–260.
- Fay, Ernst, and Claudia Quaiser-Pohl, *Schnitte: Ein Test zur Erfassung des räumlichen Vorstellungsvermögens*, Frankfurt, Germany: Swets Test Services, 1999.

- Feize, Leyla, and Catherine Faver, "Teaching Self-Awareness: Social Work Educators' Endeavors and Struggles," *Social Work Education*, Vol. 38, No. 2, 2019, pp. 159–176.
- Fenigstein, Allan, Michael F. Scheier, and Arnold H. Buss, "Public and Private Self-Consciousness: Assessment and Theory," *Journal of Consulting and Clinical Psychology*, Vol. 43, No. 4, 1975, pp. 522–527.
- Friedman, Jeffrey A., Joshua D. Baker, Barbara E. Mellers, Philip E. Tetlock, and Richard Zeckhauser, "The Value of Precision in Probability Assessment: Evidence from a Large-Scale Geopolitical Forecasting Tournament," *International Studies Quarterly*, Vol. 62, 2018, pp. 410–422.
- Garamone, Jim, "Dempsey Reflects on Leadership, Building Leaders," news release, Joint Chiefs of Staff, undated. As of September 28, 2019:
<https://www.jcs.mil/Media/News/News-Display/Article/580326/dempsey-reflects-on-leadership-building-leaders/>
- Garavan, Thomas N., Ronan Carbery, and Andrew Rock, "Mapping Talent Development: Definition, Scope and Architecture," *European Journal of Training and Development*, Vol. 36, No. 1, 2012, pp. 5–24.
- Gilley, Ann, Heather S. McMillan, and Jerry W. Gilley, "Organizational Change and Characteristics of Leadership Effectiveness," *Journal of Leadership and Organizational Studies*, Vol. 16, No. 1, August 2009, pp. 38–47.
- Goldberg, Lewis R., John A. Johnson, Herbert W. Eber, Robert Hogan, Michael C. Ashton, C. Robert Cloninger, and Harrison G. Gough, "The International Personality Item Pool and the Future of Public-Domain Personality Measures," *Journal of Research in Personality*, Vol. 40, 2006, pp. 84–96.
- Goleman, Daniel, *Emotional Intelligence: Why It Can Matter More Than IQ*, New York: Bantam Books, 1995.
- Halfhill, Terry Ray, "Personality Composition, Group Norms, and Group Effectiveness in Military Work Teams," *Dissertation Abstracts International: Section B: The Sciences and Engineering*, Vol. 61, No. 9-B, 2001, p. 5037.
- Herman, Jeffrey L., Michael J. Stevens, Allan Bird, Mark Mendenhall, and Gary Oddou, "The Tolerance for Ambiguity Scale: Towards a More Refined Measure for International Management Research," *International Journal of Intercultural Relations*, Vol. 34, No. 1, January 2010, pp. 58–65.
- Hilbig, Benjamin E., Timo Heydasch, and Ingo Zettler, "To Boast or Not to Boast: Testing the Humility Aspect of the Honesty–Humility Factor," *Personality and Individual Differences*, Vol. 69, 2014, pp. 12–16.

- Hogan, Robert, and Joyce Hogan, *Hogan Personality Inventory Manual*, 3rd ed., Tulsa, Okla.: Hogan Assessment Systems, 2007.
- Hogan, Robert, and Rodney Warrenfeltz, "Educating the Modern Manager," *Academy of Management Learning and Education*, Vol. 2, No. 1, March 2003, pp. 74–84.
- Jackson, Susan E., and Aparna Joshi, "Work Team Diversity," in Sheldon Zedeck, ed., *APA Handbook of Industrial and Organizational Psychology*, Vol. 1, *Building and Developing the Organization*, Washington, D.C.: American Psychiatric Association, 2011.
- John, Oliver P., and Sanjay Srivastava, "The Big-Five Trait Taxonomy: History, Measurement, and Theoretical Perspectives," in L. A. Pervin and O. P. John, eds., *Handbook of Personality: Theory and Research*, 2nd ed., New York: Guilford Press, 1999, pp. 102–138.
- Joint Publication 1, *Doctrine for the Armed Forces of the United States*, Washington, D.C.: Joint Chiefs of Staff, July 12, 2017.
- Joint Publication 2-0, *Joint Intelligence*, Washington, D.C.: Joint Chiefs of Staff, October 22, 2013.
- Joint Publication 3-0, *Joint Operations*, Washington, D.C.: Joint Chiefs of Staff, October 22, 2018.
- Joint Staff J-7, *Joint Officer Handbook (JOH): Staffing and Action Guide*, Suffolk, Va.: Joint Chiefs of Staff, August 2011.
- Jokinen, Tiina, "Global Leadership Competencies: A Review and Discussion," *Journal of European Industrial Training*, Vol. 29, No. 3, April 2005, pp. 199–216.
- Judge, Timothy A., Carl J. Thoresen, Vladimir Pucik, and Theresa M. Welbourne, "Managerial Coping with Organizational Change: A Dispositional Perspective," *Journal of Applied Psychology*, Vol. 84, No. 1, 1999, pp. 107–122.
- Kamalanabhan, T. J., D. L. Sunder, and M. Vasanthi, "An Evaluation of the Choice Dilemma Questionnaire as a Measure of Risk-Taking Propensity," *Social Behavior and Personality: An International Journal*, Vol. 28, No. 2, 2000, pp. 149–156.
- King, Raymond E., Erica Barto, Malcolm James Ree, and Mark Teachout, *Compilation of Pilot Personality Norms*, School of Aerospace Medicine, July 2011.
- Klimecki, Olga M., Susanne Leiberg, Matthieu Ricard, and Tania Singer, "Differential Pattern of Functional Brain Plasticity After Compassion and Empathy Training," *Social Cognitive and Affective Neuroscience*, Vol. 9, No. 6, June 2014, pp. 873–879.
- Kogan, Nathan, and Michael A. Wallach, *Risk Taking: A Study in Cognition and Personality*, New York: Holt, Rinehart, and Winston, 1964.

- Krettenauer, Tobias, Lourdes Andrea Murua, and Fanli Jia, "Age-Related Differences in Moral Identity Across Adulthood," *Developmental Psychology*, Vol. 52, No. 6, June 2016, pp. 972–984.
- Krumrei-Mancuso, Elizabeth J., and Steven V. Rouse, "The Development and Validation of the Comprehensive Intellectual Humility Scale," *Journal of Personality Assessment*, Vol. 98, No. 2, 2016, pp. 209–221.
- Landau, Barbara, and Ray Jackendoff, "'What' and 'Where' in Spatial Language and Spatial Cognition," *Behavioral and Brain Sciences*, Vol. 16, No. 2, June 1993, pp. 217–238.
- Lee, Kibeom, and Michael C. Ashton, "Psychometric Properties of the HEXACO Personality Inventory," *Multivariate Behavioral Research*, Vol. 39, No. 2, April 2004, pp. 329–358.
- Lee, Kibeom, Michael C. Ashton, David L. Morrison, John Cordery, and Patrick D. Dunlop, "Predicting Integrity with the HEXACO Personality Model: Use of Self- and Observer Reports," *Journal of Occupational and Organizational Psychology*, Vol. 81, No. 1, March 2008, pp. 147–167.
- Lee, Thomas W., Susan J. Ashford, James P. Walsh, and Richard T. Mowday, "Commitment Propensity, Organizational Commitment, and Voluntary Turnover: A Longitudinal Study of Organizational Entry Processes," *Journal of Management*, Vol. 18, No. 1, March 1992, pp. 15–32.
- Li, Jennifer J., Tracy C. Krueger, Lawrence M. Hanser, Andrew M. Naber, and Judith Babcock LaValley, *Enhancing Professionalism in the U.S. Air Force*, Santa Monica, Calif.: RAND Corporation, RR-1721-AF, 2017. As of September 23, 2019:
https://www.rand.org/pubs/research_reports/RR1721.html
- Major, Debra A., Jonathan E. Turner, and Thomas D. Fletcher, "Linking Proactive Personality and the Big Five to Motivation to Learn and Development Activity," *Journal of Applied Psychology*, Vol. 91, No. 4, August 2006, pp. 927–935.
- Markel, M. Wade, Henry A. Leonard, Charlotte Lynch, Christina Panis, Peter Schirmer, and Carra S. Sims, *Developing U.S. Army Officers' Capabilities for Joint, Interagency, Intergovernmental, and Multinational Environments*, Santa Monica, Calif.: RAND Corporation, MG-990-A, 2011. As of September 23, 2019:
<https://www.rand.org/pubs/monographs/MG990.html>
- Mata, Rui, Anika K. Josef, Gregory R. Samanez-Larkin, and Ralph Hertwig, "Age Differences in Risky Choice: A Meta-Analysis," *Annals of the New York Academy of Sciences*, Vol. 1235, October 2011, pp. 18–29.
- Mayer, John D., Peter Salovey, David R. Caruso, and Gill Sitarenios, "Measuring Emotional Intelligence with the MSCEIT V2.0," *Emotion*, Vol. 3, No. 1, 2003, pp. 97–105.

- Mazarr, Michael J., “Rethinking Risk in Defense,” *War on the Rocks*, April 13, 2015.
- McChrystal, Stanley, Tantum Collins, David Silverman, and Chris Fussell, *Team of Teams: New Rules of Engagement for a Complex World*, New York: Penguin Publishing Group, 2015.
- McCrae, Robert R., and Paul T. Costa, Jr., “The Stability of Personality: Observations and Evaluations,” *Current Directions in Psychological Science*, Vol. 3, No. 6, December 1994, pp. 173–175.
- McCroskey, James C., “Communication Competence: The Elusive Construct,” in Robert N. Bostrom, ed., *Competence in Communication: A Multidisciplinary Approach*, Beverly Hills, Calif.: Sage Publications, 1984, pp. 259–268.
- McDevitt, E., “How Adults Learn Basic Math,” in *Pennsylvania ABLE Staff Handbook*, Lancaster, Pa.: Pennsylvania State Department of Education, 2001.
- McLain, David L., “Evidence of the Properties of an Ambiguity Tolerance Measure: The Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) 1,” *Psychological Reports*, Vol. 105, December 2009, pp. 975–988.
- Mellers, Barbara E., Philip E. Tetlock, Joshua D. Baker, Jeffrey A. Friedman, and Richard Zeckhauser, “Improving the Accuracy of Geopolitical Risk Assessments,” in Howard Kunreuther, Robert J. Meyer, and Erwann O. Michel-Kerjan, eds., *The Future of Risk Management*, Philadelphia, Pa.: University of Pennsylvania Press, July 2019, pp. 1–28.
- Merriam-Webster, “Judgment,” webpage, undated-a. As of September 22, 2019:
<https://www.merriam-webster.com/dictionary/judgment>
- Merriam-Webster, “Trustworthy,” webpage, undated-b. As of September 22, 2019:
<https://www.merriam-webster.com/dictionary/trustworthy>
- Mintzberg, Henry, “The Fall and Rise of Strategic Planning,” *Harvard Business Review*, January–February 1994, pp. 107–115.
- Morris, J. Andrew, Céleste M. Brotheridge, and John C. Urbanski, “Bringing Humility to Leadership: Antecedents and Consequences of Leader Humility,” *Human Relations*, Vol. 58, No. 10, October 2005, pp. 1323–1350.
- Mount, Michael K., Murray R. Barrick, and J. Perkins Strauss, “Validity of Observer Ratings of the Big Five Personality Factors,” *Journal of Applied Psychology*, Vol. 7, No. 2, 1994, pp. 272–280.
- Mueller-Hanson, Rose A., Susan S. White, David W. Dorsey, and Elaine D. Pulakos, *Training Adaptable Leaders: Lessons from Research and Practice*, Arlington, Va.: U.S. Army Research Institute for the Behavioral and Social Sciences, RR1844, October 2005.

- Nerdinger, Friedemann W., *Zur Psychologie der Dienstleistung (On the Psychology of Service)*, Stuttgart, Germany: Schäffer-Poeschel, 1994.
- Ones, Deniz S., Stephan Dilchert, and Chockalingam Viswesvaran, “Cognitive Abilities,” in Neal Schmitt, ed., *The Oxford Handbook of Personnel Assessment and Selection*, New York: Oxford University Press, 2012.
- Oxford English Dictionary, “Communication,” webpage, undated-a. As of September 25, 2019: <https://www.lexico.com/en/definition/communication>
- Oxford English Dictionary, “Empower,” webpage, undated-b. As of September 25, 2019: <https://www.lexico.com/en/definition/empower>
- Oxford English Dictionary, “Intuition,” webpage, undated-c. As of September 25, 2019: <https://www.lexico.com/definition/intuition>
- Oxford English Dictionary, “Motivate,” webpage, undated-d. As of September 25, 2019: <https://www.lexico.com/en/definition/motivate>
- Oxford English Dictionary, “Numeracy,” webpage, undated-e. As of September 25, 2019: <https://www.lexico.com/numeracy>
- Oxford English Dictionary, “Tenacity,” webpage, undated-f. As of September 25, 2019: <https://en.oxforddictionaries.com/definition/tenacity>
- Pearson, “Wechsler Adult Intelligence Scale—Fourth Edition,” webpage, undated. As of November 29, 2023: <https://www.pearsonassessments.com/store/usassessments/en/Store/Professional-Assessments/Cognition-%26-Neuro/Wechsler-Adult-Intelligence-Scale-%7C-Fourth-Edition/p/100000392.html?tab=faqs>
- Pintrich, Paul R., “Multiple Goals, Multiple Pathways: The Role of Goal Orientation in Learning and Achievement,” *Journal of Educational Psychology*, Vol. 92, No. 3, September 2000, pp. 544–555.
- Pöhlmann, Karin, “Agency- and Communion-Oriented in Life Goals: Impacts on Goal Pursuit Strategies and Psychological Well-Being,” in Peter Schmuck and Kennon Marshall Sheldon, eds., *Life Goals and Well-Being: Towards a Positive Psychology of Human Striving*, Seattle, Wash.: Hogrefe and Huber Publishers, 2001.
- Pulakos, Elaine D., Sharon Arad, Michelle A. Donovan, and Kevin E. Plamondon, “Adaptability in the Workplace: Development of a Taxonomy of Adaptive Performance,” *Journal of Applied Psychology*, Vol. 85, No. 4, 2000, pp. 612–624.
- Quasha, William H., and R. Likert, “The Revised Minnesota Paper Form Board Test,” *Journal of Educational Psychology*, Vol. 28, No. 3, 1937, pp. 197–204.

- Ridenour, Carolyn, and Darla J. Twale, "Academic Generations: Exploring Intellectual Risk Taking in an Educational Leadership Program," *Educational Leadership Faculty Publications*, Vol. 126, No. 1, 2005, pp. 158–164.
- Roberts, Brent W., Kate E. Walton, and Wolfgang Viechtbauer, "Patterns of Mean-Level Change in Personality Traits Across the Life Course: A Meta-Analysis of Longitudinal Studies," *Psychological Bulletin*, Vol. 132, No. 1, January 2006, pp. 1–25.
- Roid, Gale H., and R. Andrew Barram, *Essentials of Stanford-Binet Intelligence Scales (SB5) Assessment*, Hoboken, N.J.: John Wiley & Sons, Inc., 2004.
- Saltzman, B. Chance, and the Air Force Strategic Integration Group, *Strengthening Joint Leaders and Teams: Recommendations and Implementation Plan*, Washington, D.C.: Department of the Air Force, January 2018.
- Schmidt, Frank L., and John Hunter, "General Mental Ability in the World of Work: Occupational Attainment and Job Performance," *Journal of Personality and Social Psychology*, Vol. 86, No. 1, January 2004, pp. 162–173.
- Sherer, Mark, James E. Maddux, Blaise Mercandante, Steven Prentice-Dunn, Beth Jacobs, and Ronald W. Rogers, "The Self-Efficacy Scale: Construction and Validation," *Psychological Reports*, Vol. 51, No. 2, 1982, pp. 663–671.
- Silvia, Paul J., and T. Shelley Duval, "Objective Self-Awareness Theory: Recent Progress and Enduring Problems," *Personality and Social Psychology Review*, Vol. 5, No. 3, 2001, pp. 230–241.
- Silzer, Rob, and Allan H. Church, "The Pearls and Perils of Identifying Potential," *Industrial and Organizational Psychology*, Vol. 2, No. 4, December 2009, pp. 377–412.
- Smith, Ronald E., "Effects of Coping Skills Training on Generalized Self-Efficacy and Locus of Control," *Journal of Personality and Social Psychology*, Vol. 56, No. 2, 1989, pp. 228–233.
- Stevens, Cynthia Kay, and Marilyn E. Gist, "Effects of Self-Efficacy and Goal-Oriented Training on Negotiation Skill Maintenance: What Are the Mechanisms?" *Personnel Psychology*, Vol. 50, No. 4, 1997, pp. 955–978.
- Strasser, R., "Mathematics at Work: Adults and Artefacts," in Jurgen Maasz and Wolfgang Schloglmann, eds., *Learning Mathematics to Live and Work in Our World: Proceedings of the 10th International Conference on Adults Learning Mathematics*, Linz, Austria: Johannes Kepler Universitat Linz, 2003, pp. 30–37.
- Straus, Susan G., Tracy C. Krueger, Geoffrey E. Grimm, and Katheryn Giglio, *Malleability and Measurement of Army Leader Attributes: Personnel Development in the U.S. Army*, Santa Monica, Calif.: RAND Corporation, RR-1583-A, 2018. As of September 17, 2019: https://www.rand.org/pubs/research_reports/RR1583.html

- Sutton, Anna, “Measuring the Effects of Self-Awareness: Construction of the Self-Awareness Outcomes Questionnaire,” *Europe’s Journal of Psychology*, Vol. 12, No. 4, November 2016, pp. 645–658.
- Sutton, Anna, Chris Allinson, and Helen Williams, “Personality Type and Work-Related Outcomes: An Exploratory Application of the Enneagram Model,” *European Management Journal*, Vol. 31, No. 3, June 2013, pp. 234–249.
- Taradash, Robert M., and Robert B. Brown, “Humility: A Mission Command Essential,” Association of the United States Army, April 20, 2015. As of September 17, 2019: <https://www.ausa.org/articles/humility-mission-command-essential>
- Taylor, Patricia G., and Monit Cheung, “Integration of Personal/Professional Self (IPPS) Through Reflective/Experiential Learning,” *Journal of Teaching in Social Work*, Vol. 30, No. 2, 2010, pp. 159–174.
- Teding van Berkhout, Emily, and John M. Malouff, “The Efficacy of Empathy Training: A Meta-Analysis of Randomized Controlled Trials,” *Journal of Counseling Psychology*, Vol. 63, No. 1, January 2016, pp. 32–41.
- Tekleab, Amanuel G., Henry P. Sims, Jr., Seokhwa Yun, Paul E. Tesluk, and Jonathan Cox, “Are We on the Same Page? Effects of Self-Awareness of Empowering and Transformational Leadership,” *Journal of Leadership and Organizational Studies*, Vol. 14, No. 3, 2008, pp. 185–201.
- Tetlock, Philip E., and Dan Gardner, *Superforecasting: The Art and Science of Prediction*, New York: Crown Publishers, 2015.
- Thompson, Renee J., and Howard Berenbaum, “Adaptive and Aggressive Assertiveness Scales (AAA-S),” *Journal of Psychopathology and Behavioral Assessment*, Vol 33, 2011.
- Titsworth, Scott, and Kristen Okamoto, “Communication Competence,” *The International Encyclopedia of Organizational Communication*, March 2017.
- Trapnell, Paul D., and Jennifer D. Campbell, “Private Self-Consciousness and the Five-Factor Model of Personality: Distinguishing Rumination from Reflection,” *Journal of Personality and Social Psychology*, Vol. 76, No. 2, 1999, pp. 284–304.
- Trudeau, Kimberlee J., and Rosandra Reich, “Correlates of Psychological Mindedness,” *Personality and Individual Differences*, Vol. 19, No. 5, November 1995, pp. 699–704.
- U.S. Department of Defense, *DoD Dictionary of Military and Associated Terms*, Washington, D.C., September 2018, updated June 2020.
- Van Montfort, André, Laura Beck, and Anneke Twijnstra, “Can Integrity Be Taught in Public Organizations?” *Public Integrity*, Vol. 15, No. 2, Spring 2013, pp. 117–132.

- Vandenberg, Steven G., and Allan R. Kuse, "Mental Rotation, a Group Test of Three-Dimensional Spatial Visualization," *Perceptual and Motor Skills*, Vol. 47, No. 2, October 1978, pp. 599–604.
- Vandewalle, Don, "Development and Validation of a Work Domain Goal Orientation Instrument," *Educational and Psychological Measurement*, Vol. 57, No. 6, December 1997, pp. 995–1015.
- Vandewalle, Don, and Larry L. Cummings, "A Test of the Influence of Goal Orientation on the Feedback-Seeking Process," *Journal of Applied Psychology*, Vol. 82, No. 3, 1997, pp. 390–400.
- Vego, Milan, "On Military Creativity," *Joint Force Quarterly*, No. 70, 2013, pp. 83–90.
- Von Rosenstiel, Lutz, "Employee Behavior in Organizations. On the Current State of Research," *Management Revue*, Vol. 22, No. 4, 2011, pp. 344–366.
- Vroom, Victor H., and Bernd Pahl, "Relationship Between Age and Risk Taking Among Managers," *Journal of Applied Psychology*, Vol. 55, No. 5, 1971, pp. 399–405.
- Wonderlic, E., and, C. I. Hovland, "The Personnel Test: A Restandardized Abridgment of the Otis S-A Test for Business and Industrial Use," *Journal of Applied Psychology*, Vol. 23, No. 6, 1939, pp. 685–702.
- Wright, George N., Lawrence D. Phillips, Peter C. Whalley, Gerry T. Choo, Kee-Ong Ng, Irene Tan, and Aylene Wisudha, "Cultural Differences in Probabilistic Thinking," *Journal of Cross-Cultural Psychology*, Vol. 9, No. 3, September 1978.
- Wrzesniewski, Amy, Barry Schwartz, Xiangyu Cong, Michael Kane, Audrey Omar, and Thomas Kolditz, "Multiple Types of Motives Don't Multiply the Motivation of West Point Cadets," *Proceedings of the National Academy of Sciences*, Vol. 111, No. 30, July 2014, pp. 10990–10995.
- Yamazaki, Yoshitaka, and D. Christopher Kayes, "An Experiential Approach to Cross-Cultural Learning: A Review and Integration of Competencies for Successful Expatriate Adaptation," *Academy of Management Learning and Education*, Vol. 3, No. 4, 2004, pp. 362–379.
- Yukl, Gary, Angela Gordon, and Tom Taber, "A Hierarchical Taxonomy of Leadership Behaviors: Integrating a Half Century of Behavior Research," *Journal of Leadership and Organizational Studies*, Vol. 9, No. 1, August 2002, pp. 15–32.
- Yukl, Gary, and Richard Lepsinger, "Leading Change: Adapting and Innovating in an Uncertain World," *Leadership in Action*, Vol. 26, No. 2, May/June 2006, pp. 3–7.

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

Zhang, Don C., Scott Highhouse, and Christopher D. Nye, “Development and Validation of the General Risk Propensity Scale (GRiPS),” *Journal of Behavioral Decision Making*, Vol. 32, No. 2, April 2019, pp. 152–167.