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In Pursuit of Insight

The Everyday Work of Intelligence Analysts Who Solve Real World Novel Problems

Adrian Wolfberg, Ph.D.

Research Fellow, National Intelligence University, 2020-21

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Adrian Wolfberg, Ph.D.

NATIONAL INTELLIGENCE UNIVERSITY

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Abstract

The Intelligence Community (IC) has identified insight as a desirable outcome of its intelligence assessments, but the community does not understand the insight process well enough to consistently achieve such an outcome. This gap of knowledge places intelligence analysts and managers in a double bind and reduces their ability and motivation to comply with policymakers' calls for insightful assessments. Theoretically, insight and creativity have been studied under very specific conditions: in controlled laboratory experiments, interviews, or historical reviews of either individuals who work in full-time creative positions that produce recognized creative outcomes, like Nobel Prize winners, or those who experience critical incidents. Little, if any, research has considered professionals not in full-time creative positions—e.g., intelligence analysts who apply analytical knowledge—who periodically are insightful. To fill these practitioner and theoretical gaps, a qualitative, interview-based study was conducted to understand how insight emerged in 36 intelligence analysts who solved novel problems. The findings identified a four-phase process: a triggering phase consisting of unpredictability, problem finding, problem type, and conflicting representations; an emergence phase consisting of internalized tensions, priming, and dwell time; an insight phase; and an after-insight phase consisting of resistance, mitigation, and solutions. The process produced four archetypes of insight outcomes across the emotion-cognition and individual-social dimensions: understanding of novel problems; effective communication of complexity with others; self-reflection and greater awareness; and navigation of organizational politics and agendas. Individuals who experienced insights developed long-term, compelling emotional and cognitive benefits.

Key Findings

A study of 36 intelligence analysts who have experienced insight revealed four archetypes of insight across the emotion-cognition and individual-social spectrums, suggesting that each type contributes in key ways to solving novel problems. Whereas the academic literature has primarily considered insight a cognitive, solitary act, this study provides evidence that emotionally based insight has just as much problem-solving power as cognitively based insight, in both individual and social contexts.

Analysts do not have a single, “aha” insight. They have multiple insights that build upon one another until the final insight is achieved. Although this finding reinforces previous research, the implications for managers of intelligence analysts are profound: do not assume that the first or initial insight is the final one and let analysts continue mulling over their novel problems.

The analysts in this study often spent years thinking about a novel problem until they reached a solution, while they also worked on competing tasks that took time and effort. Expecting analysts to solve a novel problem upon command within minutes or hours or even days may be an unrealistic management expectation.

Solving novel problems invites multiple approaches and answers, which implies that competition and collaboration within and across organizations for ideas are natural and desired processes when facing novel problems. An organization that considers its main focus to be routine problem-solving may unintentionally discourage these valuable and necessary competitive or collaborative behaviors, instead viewing them as inefficient.

This study points to powerful emotional and cognitive long-term benefits for individuals experiencing insight, and these benefits have positively shaped professional development and personal lives, suggesting that organizations should require a creativity climate for dealing with novel problems. Insight is more than nice-to-have; insight is a critical and necessary organizational and individual competency.

Analysts learn from insights early in their tenure and in new assignments, and their organizations gain new ways of thinking fostered by such insights. Managers should foster early tenure experiences with insight—encouraging analysts to explore the unknown before the analysts adjust to organizational norms as they advance in tenure. Creating time and space for insight is especially important in hierarchical organizations, like those in the IC, which tend to emphasize order and control and so face a particularly complex challenge from the unpredictable nature of insight.

Although the insight literature has discussed unpredictability as part of the actual insight after problem-solving had begun, this study showed unpredictability occurring as the analysts initiated the entire insight process. This raises questions for further study about how individuals prepare themselves for journeys into the unknown, which is required for solving novel problems, and how managers leverage such opportunities.

Although the psychological literature defines priming as memories intentionally signaled in one's past that specifically target a desired response in one's future, in this study of intelligence analysts, the signaling occurred in the analyst's present, drawing upon memories unintentionally created in that person's past experience. This finding suggests that having a stockpile of diverse lifetime experiences and knowledge upon which to draw would facilitate a robust capability that can be exploited when the unpredictable need arises in an individual's present to solve novel problems.

The nonlinear relationship among internalized tensions, priming, and insights suggests that adopting a mindset of temporal complexity—viewing time as a subjective, experiential phenomenon composed of multiple perspectives—can inform the analyst that the present does not stand alone: the path of the present has been shaped by the past, and the future does not mysteriously appear out of nowhere.

The irony is that, although one of the main functions of intelligence is the reduction of uncertainty, an organization's lack of understanding of the insight process actually increases uncertainty. By prioritizing insight and fostering a climate that enables the insight and creativity processes, however, organizations—including those within the IC—can over time reduce uncertainty about the potential and actual effects from novel problems.

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Introduction

Contrary to what we usually believe, ...the best moments in our lives, are not the passive, receptive, relaxing times—although such experiences can also be enjoyable, if we have worked hard to attain them. The best moments usually occur when a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile.

—Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience*

Problem

Organizations across the public, private, and nonprofit sectors use intelligence assessments to protect themselves against external threats and to leverage opportunities. Individuals who produce such assessments are called intelligence analysts. Intelligence analysts create narratives that make judgments about a threat or an opportunity, and they interpret such effects on the organization so that decisionmakers may consider whether and how to act.¹ Such intelligence analysts are individuals whose everyday tasks frequently bring them face-to-face with novel problems.

Novel problems are typically the highest stake and highest risk challenges to organizations. Since the world is filled with uncertainty and ambiguity, such assessments can be critical to an organization's success. In the national security arena, intelligence analysts have an especially challenging time because foreign adversaries—who pose threats but may also offer mitigating opportunities—neither transparently nor willingly provide all the information needed for analysts to do their jobs. The same challenges exist for law enforcement and competitive business intelligence, although the threats their adversaries pose are different. Failure to provide effective assessments can harm not only intelligence organizations but also the customers they serve.

No wonder that U.S. national security consumers of intelligence assessments have emphasized the need for insight, especially after the terrorist attacks of September 11, 2001, and the erroneous conclusion that Iraq had a nuclear program.² These two intelligence failures called into question the very intelligence capabilities of the United States.³ Placing a priority on insight reflects the value proposition that consumers do not want to be surprised; they want to be told something they do not already know, and they will access useful information from other sources such as the media, think tanks, private intelligence companies, academia, and political advisers.

Over time, the lessons-learned studies from these two intelligence failures, as well as other studies, resulted in a series of policies focused on the need for analysts to produce insightful products. Executive Order

12333 on United States Intelligence Activities, as amended in 2008, added the word “insightful” into a sentence that sets the expectations for analytic performance: “Special emphasis shall be given to the production of timely, accurate and *insightful* reports, responsive to decision makers...”^{4*} The 2019 National Intelligence Strategy of the United States of America states the IC’s mission is to provide “...*insightful*, objective, and relevant intelligence...”⁵ Intelligence Community Directive 203 on “Analytic Standards,” of January 2, 2015, was crafted, in part, to address “insight”: “Analytic products should provide information and *insight* on issues relevant to the customers of U.S. intelligence...”⁶ The ODNI’s “Rating Scale for Evaluating Analytic Tradecraft Standards,” of November 6, 2015, required *insight* to be demonstrated in judging the quality of underlying sources, data, and methodologies; customer relevance and implications; and incorporation of effective visual information.⁷

To date, however, no one in the IC has explained the insight process or how one knows whether one is insightful.

Research Question

To understand the emergence of insight within intelligence analysts—individuals who do not work in a full-time creative profession—the following research question is posed: how does insight emerge in individuals who do not work in full-time creative professions when they are solving novel problems?

Scope

Focusing this exploratory study solely on the insight process, however, would limit our understanding of this phenomenon, and consequently reduce its utility in helping the IC achieve the desired policy outcome. Insight is embedded within the broader phenomenon of creativity,⁸ which is a process that both includes insight and takes place within the individual’s social and organizational environment.⁹ Hence, this study of how insight emerges is conducted through the broader lens of a creativity framework as it manifests itself through the intelligence analyst’s efforts to solve novel problems.

Intelligence analysis is primarily a solitary act embedded within a social context; it starts within the individual and that person’s reflection on a problem or issue.¹⁰ As a result, an examination of insight and creativity begins squarely in the realm of individual learning. Although the phenomena of insight and creativity can be framed at the organizational level of analysis through the lenses of leadership, rewards, networks, and team composition and processes, to name a few, the unit of analysis that ultimately initiates these phenomena is the individual.¹¹

Individual learning involves shifts in mental models.¹² A mental model is an individual’s cognitive representation of some aspect of the world,¹³ and a shift, therefore, allows an individual to see the world differently. Novelty requires such shifts. As an individual learns, not only do that person’s cognitive structures improve

* Italicization of the words “insight” and “insightful” are the author’s, when used in quoted sections of policy.

over time,¹⁴ but also the capabilities of the organization to which that person belongs may be enhanced.¹⁵ Hence, insight is one of the reasons individual learning is so important to an organization.

Although the focal point of this exploratory research is the individual who is not in a full-time creative profession, interesting research into well-known individuals who are in creative professions has had a major role in shaping what is known about individual insight and creativity,¹⁶ and will be tapped. That research includes interviews, for example, with Nobel Prize winners and a retrospective analysis of Charles Darwin, who solved novel problems. As observed in these studies, insight emerges in solving novel problems, with emergence being the “cooperative interaction that produces ... effects” that would not otherwise come into existence.¹⁷

Purpose Statement

The purpose of this study is twofold. First and most importantly, it can help improve the internal capability of intelligence analysts and their organizations, and second, by doing so, it can help intelligence organizations comply with their customer mandate to be insightful in analytic products. Application of this study’s lessons to the recruitment and selection of new analysts might become a tertiary benefit.¹⁸

Relevance to the Intelligence Community

IC policy that requires analysts to create insightful products implies a known process for producing insight. However, this phenomenon is not empirically understood by intelligence analysts, managers, and leadership.¹⁹ Not understanding the process for promoting insight prevents intelligence agencies from enabling effective strategies to meet that goal, and it places working-level analysts producing intelligence assessments and those supervising them in a double bind.²⁰ The first bind is the implication that, if analysts are not insightful, they will be held accountable for not complying with the IC objective. The second bind is the tendency for analytic managers to focus on legitimate deadlines and task quantities, leading them to press working-level analysts or their first-level supervisors to provide quick assessments—implicitly at the expense of insight. The mixed messages of this double bind phenomenon can muddle an analyst’s motivation for delivering an insightful product.²¹

The first step in overcoming this double bind—and in guiding individual analysts and their intelligence organizations toward insightful assessments—is to realize that insight is a psychological and a social-psychological phenomenon. Intelligence agencies can gain valuable lessons on insight by looking beyond intelligence, history, and national security studies—their traditional purview—and exploring the disciplines of psychology and social psychology in order to reflect upon themselves and their practices.²² From the psychological and social-psychological perspective, the IC can better understand what insight really is within its domain and how the insight process can manifest itself in knowledge production by intelligence analysts.²³ Such reflection may also help address the IC’s legitimate emphasis on error mitigation, which has overshadowed the newfound focus on insight²⁴—for logic would argue that insightful assessments should reduce intelligence failures.

Literature Review

The literature review begins with an introduction of foundational concepts, which include what a problem is, what a novel problem is, the emotion-cognition connection involved in solving problems, and the adoption of an information-processing approach as a theoretical framework. Next discussed are various aspects of insight: definitions of insight, phenomena related to insight, types of insight, overview of insight theories, and two key information-processing theories of insight. The literature review continues with a discussion of relevant aspects of creativity: definitions of creativity, phenomena related to creativity, types of creativity, overview of theories of creativity, two key information-processing theories of creativity, and antecedent conditions affecting creativity. This section informs the Conceptual Framework, discussed after the Literature Review, with a literature-based framework on insight that provides a starting point for the study of insight in intelligence analysts.

Introduction of Foundational Concepts

Problems

Insight can occur when an individual tackles a problem. A problem is the cognitive and/or emotional attention one experiences when one's wants, needs, or desires remain unrealized.²⁵ Attention is the "noticing, encoding, interpreting, and focusing of time and effort,"²⁶ and it is shaped by routines and bounded rationality.²⁷ What an individual pays attention to depends on their context or situation.²⁸ Because individuals live with bounded rationality, their heedful and selective attention must constantly select pieces of available information while ignoring others.²⁹ The challenges for individuals are to be self-aware about what catches their attention, to prioritize their attention, and to identify distraction-reducing mitigation mechanisms.³⁰ Problems, therefore, are inherently difficult tasks.

Novel Problems

Individuals who solve novel problems provide a unique real-world opportunity to inquire into the process of insight.³¹ Because novel problems have not been experienced previously by the individual, that person will have little to no prior understanding or established processes to apply to solving those particular problems. One example of a novel problem faced by an IC analyst was figuring out the nature and purpose of what the analyst had come to consider a suspicious facility, which neither the analyst nor the analyst's community had previously identified as a security threat. In contrast, non-novel problems are solved through established analytic reasoning

processes, in which the problem-solving effort largely belongs to memory and the retrieval of techniques and procedures.³² Novel problems are the most challenging type and much more difficult to solve than known problems.

Emotion-Cognition Connection

Emotion and cognition are interactive—a connection observed when individuals engage in solving problems, as studied by U.S. neuroscientist Antonio Damasio.³³ Emotions include motivations, passion, intentionality, feelings, courage, risk-taking, altruism, openness, and surprise.³⁴ Cognition includes attention, decisionmaking, categorization, patterns, comprehension, reasoning, and inferences.³⁵ Certain phenomena can have both emotional and cognitive qualities, for example, intuition and trust.³⁶ All cognitive processes have an emotional component.³⁷

As Damasio describes, the interaction between emotion and cognition guides how decisions are made.³⁸ The mechanism for this connection has the label *somatic markers*, which influence the individual's attention to the desired decision. If a bad outcome is anticipated, then the individual experiences an unpleasant gut feeling, which serves as an alarm to avoid the perceived bad choice; if a good outcome is anticipated, then the individual experiences an incentive toward embracing the perceived good choice.³⁹ These markers are influenced by past experience and, as a result, individuals make judgments that are influenced by their emotional anticipation.⁴⁰ The somatic markers can be conscious, in which case the individual can be deliberate in making a decision; however, the markers can also be unconscious.⁴¹

Information Processing

Solving a problem is the effort involved in transforming the unrealized state to the desired state.⁴² Information processing is an effective way to investigate this transformation⁴³ because it is the study of how individuals take in, consider, synthesize, and use information to accomplish a task.⁴⁴ Although insight is often confused with creativity, insight is a critical information-processing component of the creativity process.⁴⁵ The literature on insight, therefore, is discussed next, followed by a discussion of the creativity literature.

Insight

Definitions of Insight

Insight is both an outcome and a process. Colloquially, the word insight, which comes from the Old Dutch, means *seeing inside*.⁴⁶ As an outcome, insightful ideas shed light on the inner nature of a person, thing, or situation⁴⁷—leading policy customers to cherish insightful knowledge products. Insightful ideas might include an unrecognized fundamental truth, a new view about the world that challenges the old view, or an observation that yields a deep understanding or reveals hidden motivations that influence an individual's feelings, behaviors, and actions.⁴⁸ Insights can occur, therefore, in either the emotional or cognitive domains.

As a process, insight can be defined as the cognitive process in which an individual approaches a cognitive conflict and overcomes the conflict to see anew.⁴⁹ Internal and external factors that affect cognition include time, restructuring, reorientation, level of difficulty, and degree of cognitive fixation.⁵⁰ Scholars have framed the influence of these factors in various ways—a psychological experience, a problem-solving sequence, a type of problem, and a problem-solving process—and what is common within each way is a shift in thought and/or emotion.⁵¹ For example, insight can be defined as a cognitive process in which “...a nonobvious revision to a person’s mental model of a dynamic system results in a new set of beliefs that are more accurate, comprehensive, and useful.”⁵²

The primary focus of this study is on revealing the process of insight within the intelligence analyst. This study defines insight, in general, as the experiential process whereby an individual’s cognitive and/or emotional features—whether internally or externally initiated—produce a shift in an individual’s understanding of a problem. The study defines insight as an outcome in which new knowledge is created—i.e., knowledge that comes into existence for the first time—for the knowledge producer and/or consumer. To reveal the details of the insight process during an analyst’s problem-solving effort, an informational processing approach is used.⁵³

Phenomena Related to Insight

Three process-related phenomena are related to insight: imagination, intuition, and priming. Imagination is sometimes considered the same as insight, but they are two distinct, yet related, phenomena. Imagination is the capacity for generating and exploring alternate possibilities that are not currently present in the mind of the individual, and therefore, it is an important but not necessary component of insight.⁵⁴ Imagination operates in the background, allowing the individual to manipulate ideas that may not presently be considered real; it engages the individual’s emotions and motivations and plays a role in making inferences.⁵⁵ If imagination is viewed as a capacity, then insight is the activation of that capacity through the manipulation of ideas and emotions in pursuit of problem-solving.⁵⁶ Imagination may not result in insight, but insight is unlikely to happen without imagination.

Colloquially, intuition refers to the feelings that individuals have in their guts, the vibes they sense, or their mental hunches about something.⁵⁷ Intuition involves a sense of vague and unstated, or implied, knowledge, whereas insight eventually—or sometimes quickly—appears to an individual and results in clarity of focus.⁵⁸ Intuition has the following characteristics: (1) the process is unconscious—i.e., automatically occurring in the mind with limited or no ability to reconstruct; (2) one’s perceptions of the environment are associated unconsciously with cognitive patterns; and (3) the associations manifest themselves quickly and result in an emotionally charged belief.⁵⁹ From an information-processing perspective, intuition could occur as part of the insight process—but not necessarily.

U.S. social psychologists John Bargh and Tanya Chartrand have introduced a phenomenon related to insight that guides thinking, called priming.⁶⁰ Priming is defined as an internal mental process that mediates, in a hidden manner, the environment’s effect on the individual’s thinking process. As observed in laboratory experiments, conceptual priming applies an idea or concept from one’s past experience to exert

an influence on a different present context. The individual is not aware of this influence because priming, like intuition, is unconscious. Priming has usually been researched in laboratory experimental conditions, but it is assumed to occur in real-life situations.⁶¹ Involuntary recollections of oneself take place in daily life, triggered by something happening in the individual's present circumstance.⁶² The stronger the emotional impact from the past experience, the longer the priming effect will last into the future.⁶³ Emotional experience—defined as the conscious awareness of past meaningful objects, events, or states—guides (i.e., primes) an individual's action in the present.⁶⁴ U.S. information systems and neuroscience scholar Richard Minas and his colleagues have recently conducted the first study to show empirically that priming improves the generation of ideas associated with insight and creativity.⁶⁵

Types of Insight

An empirical study by Hungarian-American psychologist Mihaly Csikszentmihalyi and R. Keith Sawyer has revealed two types of insight processes: short- and long-term insight.⁶⁶ In short-term insight, the individual conceptualizes a problem, which has been considered previously in a similar context, and the necessary resources are available to find a solution. Long-term insight occurs when the individual has difficulty conceptualizing the problem, perhaps because it has never been previously formulated, or, if it had, its formulation was imprecise or left ambiguous. Csikszentmihalyi and Sawyer, therefore, call short-term insight part of a “presented problem-solving” process, while long-term insight is part of a “discovered problem-finding” process.⁶⁷

In Gary Klein and Andrea Jarosz's empirical study of real-world incidents involving insight from individuals in a variety of domains, the U.S. psychologists found many aspects of the insight process.⁶⁸ For Klein and Jarosz, an incident means a specific event has occurred in which individuals they have studied retroactively gained a new understanding of what caused the specific event, of new relationships among the event's elements, or of new ways to achieve some outcome.⁶⁹ Some insights result from individuals making connections among different data or filling a data gap; identifying contradictions in their thinking, disregarding a contradiction, or further exploring it; being skeptical or being open-minded; receiving new data or reorganizing their thinking without new data; and having time to let the problem sit (i.e., incubate) or struggle with an impasse.

Overview of Theories of Insight

Cognitive neuroscientists Sebastien Hélie and Ron Sun's review of the literature divides insight processing theories into four categories.⁷⁰ First, constraint theory assumes that many restrictions exist on freedom of thinking, action, and movement surrounding a problem, and that an individual's cognitive limitations make it very difficult to overcome these constraints. When the constraints are overcome, the individual experiences a forceful cognitive and emotional experience. Second, fixation theory assumes that restrictions surrounding the problem exist, as in constraint theory, but not all of the constraints are known to the individual. Individuals who attempt to solve the problem may incorrectly identify a particular constraint

as part of the problem—when it is not—and thereby limit the search for a solution. An individual's experience of insight occurs when these incorrectly identified restrictions are no longer considered to be constraints. As a result, the individual can consider a wider set of possible solutions.

Third, associationistic theory does not require an impasse or a constraint to be present during the problem-solving process in order to achieve an insight. Individuals solve problems by using a parallel search process in which they associate different pieces of knowledge relevant to the problem. Fourth, evolutionary theory, based on Charles Darwin's theory of natural selection, posits three principles: possible solutions are generated through blind variation, that is, variation without a controlling consciousness identifying the possible solutions; a solution is evaluated and selected; and a solution is retained. In this theory, the generation of possible solutions and the selection of a solution is unconscious, and only when the solution is selected does the individual become conscious of it.

Cognitive scientist Stellan Ohlsson's review of the literature yields three processes through which insight is produced.⁷¹ The first is combination, in which cognitions are combined, either unconsciously or consciously, leading to a new idea or mental model. The second process is accumulation, which is the iterative movement via small steps away from what and how the individual initially understands the problem and then toward the unknown. These small steps occur through a long sequence of thought decisions. Accumulation can occur in two ways: (1) an evolutionary type of variation and selection takes place when the individual decides that a direction in thinking is not productive and either gives up or persists in searching for a solution, or (2) heuristic search, in which the individual builds upon knowledge gained in past efforts to solve a problem and applies that learning forward. If the problem is new and unknown, then individuals do not initially have heuristics at their disposal and so the search for solutions may be random. If the problem is known, then heuristics facilitate the solution search steps. The third process is restructuring, in which every entity—whether conceptual, physical, or event—is an individual's interpretation. Restructuring theories include: representation of change as a result of the insight; the change process that produces the restrictions; and the triggers for the change process.

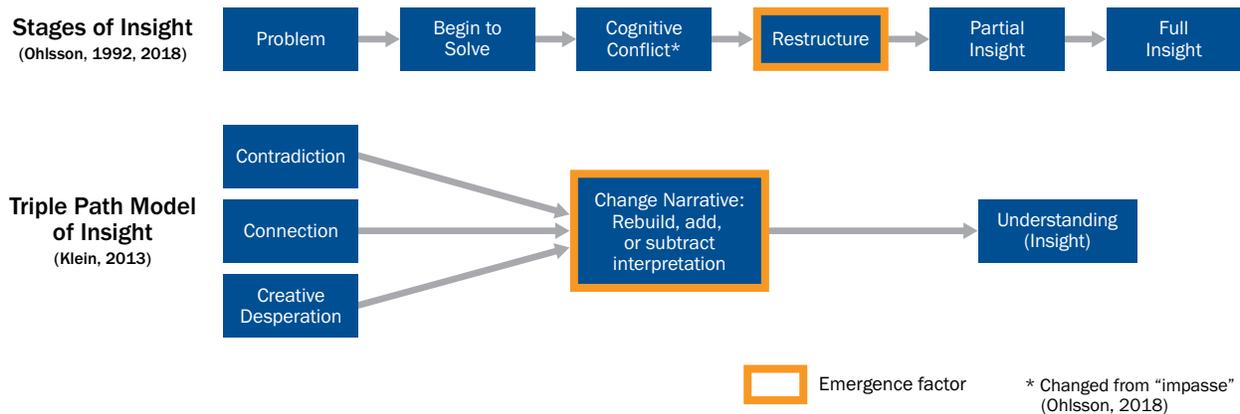
Two Key Information Processing Theories of Insight

Ohlsson⁷² and Klein⁷³ both provide end-to-end information processing-related theories of insight. Figure 1 depicts these two theories of insight and identifies which stage is the emergence factor prior to insight. For Ohlsson, the emergence factor is restructuring, and for Klein, it is changing the narrative. These factors are discussed in more detail below.

Ohlsson conceives of insight as a six-stage process, with each stage exhibited across three types of human activity: computational, phenomenological, and behavioral.⁷⁴ Stage 1 is problem representation, i.e., individuals perceive a problem. Problem representation, from an information processing perspective, includes four cognitive components: how individuals initially understand the problem; what they assume will be the final outcome; what they consider to be at their cognitive disposal to progress from their initial understanding to the final outcome; and what they consider to be the constraints operating within the situation.⁷⁵ Computationally,

individuals cognitively represent the problem, in a process called encoding. Phenomenologically, they understand what the problem is. Behaviorally, they use various sensory methods to access information.

Figure 1. Two Key Information Processing Theories of Insight



Author's figure based on the following sources: Stellan Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," in *Advances in the Psychology of Thinking*, ed. Mark T. Keane and Kenneth J. Gilhooly (Hempstead, UK: Harvester Wheatsheaf, 1992), 1-44; Stellan Ohlsson, "The Dialectic between Routine and Creative Cognition," in *Insight: On the Origins of New Ideas*, ed. Frederic Vellee-Tourangeau (New York: Routledge, 2018), 8-29; and Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (New York: Public Affairs, 2013).

Stage 2 is problem-solving. Computationally, individuals consider approaches to solving the problem. Phenomenologically, they implement these approaches. Behaviorally, the actions taken for each approach either work or not, and—when an action does not work—the individuals attempt another action.

Stage 3 is the impasse, which occurs when individuals represent the problem in a particular way but do not have access to the knowledge required to solve the problem. Computationally, individuals search for new ways to represent the problem. Phenomenologically, they draw a blank, halting the attempted solution approach. Behaviorally, therefore, no activity is evident. After first presenting his stages of insight in 1992, however, Ohlsson revised his description of Stage 3 from impasse to cognitive conflict, reflecting what had become the dominant view of psychologists.⁷⁶ Similar to U.S. social psychologist Leon Festinger's theory of cognitive dissonance,⁷⁷ Ohlsson's view of cognitive conflict has come to represent the difference between knowledge gained in the past from knowledge acquired in the present. Ohlsson points out that laboratory experiments focusing on single attempts at solving a problem validate this idea of cognitive conflict as a trigger condition for insight.⁷⁸ Nonetheless, in everyday, real-life insight situations, he suggests that such triggering can emerge from similarities between past and present experiences, as well as from conflicting experiences.⁷⁹

Stage 4—which is restructuring, or re-representing, the initially conceived problem—overcomes impasses (or cognitive conflicts). Computationally, restructuring is accomplished in at least one of three ways: elaboration, re-encoding, or constraint relaxation. Other ways of restructuring are possible.⁸⁰ Elaboration is

the intensification of an individual's attention to a problem. For example, the individual detects—through more careful analysis—aspects of the problem not previously considered, or the individual recalls—from long-term memory—information that was not initially considered when the original problem was represented. In re-encoding, the individual dismisses some or all of the original representation of the problem, and instead contemplates one or more less considered and analyzed representations. Constraint relaxation reduces the restrictions—usually those associated with the anticipated solution—that the individual has self-imposed during the initial problem representation, which ensured the problem would not be solved. Phenomenologically, the individual perceives the problem in a different way. Behaviorally, no activity is evident because the restructuring occurs within the individual.

Stage 5 is partial insight, or the act of breaking through an impasse (or cognitive conflict). Individuals encounter multiple impasses and partial insights with complex problems, and their cognitive limitations affect the type and number of partial insights they reach.⁸¹ Computationally, partial insight occurs when the restructuring overcomes the impasse. Phenomenologically, partial insight is the individual's recognition of a new or different solution. Behaviorally, the individual saying or thinking “aha” (or something to that effect) signals partial insight.

Stage 6 is full insight, reached when the individual transforms partial insight into an understanding of the problem's complete solution. Computationally, the individual discovers the connection (or pathway) between partial insight and the solution to the problem. Phenomenologically, the individual formulates a narrative that allows a full understanding of the solution. Behaviorally, the individual takes actions or makes decisions to carry out the solution.

Klein offers a second information processing-related insight theory: the Triple Path model of insight.⁸² This model consists of three strategies to achieve insight or, as Klein calls it, understanding: the contradiction path, the creative desperation path, and the connection path.⁸³ Four steps propel the individual along the course of these alternative strategies, or paths: the motivation, the trigger, the activity, and the outcome.

The contradiction path begins with the individual's motivation to question the status quo and to rethink what others accept as the correct choice. The trigger is the individual's recognition of one or more contradictions in a situation, which the individual concludes are inconsistencies that need to be resolved. These inconsistencies are resolved through an activity involving what Klein calls anchors and stories.⁸⁴ Stories are narratives that individuals use to communicate how the specifics of an event or situation are to be interpreted and organized so they make sense. Such framing involves sharing an individual's views about a situation, steering others to relevant information about the situation, and constraining the dimensions of the situation to be evaluated.⁸⁵ Klein's research suggests that stories typically are built upon three to four anchors, i.e., the individual's foundational viewpoints about the situation. On the contradiction path, the activity involves identifying a weak anchor, which can be manipulated or interpreted differently. By detecting the inherent flexibility of a weak anchor and effectively building upon that flexibility, the individual is able to revise the story and create a new narrative that resolves the inconsistency. The outcome of the contradiction path is the change in how the individual cognitively understands a given or future situation. The contradiction path (as well as the other two paths), therefore, occur within an individual and have a cognitive component.

The creative desperation path begins with a completely different motivation: the need to avoid or evade a bad set of circumstances. The trigger is overcoming an impasse in order for the individual to avoid the poor conditions. The activity involves identifying and eliminating one or more invalid, weak anchors. By replacing a weak anchor, or viewpoint, the individual constructs a new story about the situation, providing the escape necessary to avoid the bad set of circumstances. The outcome, in principle, offers the same kinds of possibilities as the contradiction path.

The connection path begins with a different type of motivation than the contradiction or creative desperation paths. Instead of facing a negative situation where the individual has to get out of a messy situation, the motivation for the connection path is positive. The individual perceives one or more new implications about a situation, i.e., one or more new or different consequences. The trigger is the realization of new connections between ideas or the awareness of chance occurrences. The activity involves creating or adopting a new anchor, typically acquired from new information. On the connection path, new anchors are combined with the existing set of anchors to add to the story, whereas in the contradiction and creative desperation paths, the existing weak anchors are either revised or replaced. The outcome, in principle, is the same as the other paths: a change in how the individual understands a situation.

Creativity

Definitions of Creativity

Colloquially, creativity is the process of coming up with something new. From a scholarly perspective, particularly in the field of psychology, much has been written about creativity.⁸⁶ For example, during the first decade of this century, over 10,000 papers were written about creativity from the perspectives of cognitive, developmental, clinical, social, and industrial psychology.⁸⁷ Psychologists have formulated various definitions, some by combining attributes across these perspectives. For example, Robert Sternberg considers creativity to be a multifaceted construct consisting of intelligence (as in the capacity for knowing and understanding), cognitive style, and personality,⁸⁸ while Klein and his colleagues view creativity as an iterative process.⁸⁹ From an information processing perspective, creativity is the invention of something that is new, but newness is not sufficient; it is also necessary to be useful.⁹⁰

Phenomena Related to Creativity

Creativity has often been confused with two related phenomena: sensemaking and innovation.⁹¹ The general consensus among researchers has been that sensemaking is a process that individuals use to understand ambiguous or confusing situations.⁹² Sensemaking is about interpreting what has already happened within an individual's perception of the world. The individual attempts to make connections within the situational context to understand its implications and then direct their actions.⁹³ Since creativity is an iterative process, it is not surprising to find that sensemaking may involve creativity, and creativity may involve sensemaking.⁹⁴ However, the two phenomena are different and are experienced in a temporally reversed order:

creativity is a forward-looking process in which the individual begins with a problem and attempts to solve it, whereas sensemaking is a backward-looking process in which the individual begins with a confusing situation and retrospectively interprets it in order to understand the situation.⁹⁵

Creativity and innovation are also related, but different, phenomena. Creativity is the process of coming up with a new idea, whereas innovation is the application or implementation of the new idea into a process, procedure, or rule.⁹⁶ Creativity is typically associated with the individual, while innovation is conceptualized as a social or organizational process.⁹⁷ The research on innovation within organizations focuses on four factors: innovation characteristics (e.g., perceived usefulness, perceived ease of use, complexity, etc.); social factors (e.g., norms, peers, critical mass, etc.); organizational factors (e.g., management support, empowering leadership, policies and practices, participation in decisionmaking, implementation climate, etc.); and individual factors (e.g., demographics, learning orientation, personal innovativeness, etc.).⁹⁸

Types of Creativity

James Kaufman and Ronald Beghetto, U.S. professors of educational psychology, have categorized creativity according to the activities of four types of individuals: “big creativity,” “professional creativity,” “little creativity,” and “mini-creativity.”⁹⁹ Big creativity is the activity of individuals in creative professions who are recognized for changing how people think about the world; such individuals include Nobel Prize and Pulitzer Prize winners. Professional creativity is the activity of individuals who do creative things professionally but have not revolutionized their professions. Such individuals are engaged on a daily basis with creative endeavors and include those in the fine arts, entertainment, design, and the sciences. Little creativity is the activity of individuals who are not in an everyday creative profession but who are engaged creatively by periodically activating dispositions and behaviors that are unconventional and demonstrate inquisitiveness, imagination, and freedom of thought. Mini-creativity is the activity displayed in the classroom, specifically in elementary, junior high, and high school students. Among these four types, little creativity is most applicable to individuals in the everyday workplace who do not have the full-time responsibility of being exclusively creative,¹⁰⁰ and arguably would include intelligence analysts.

Theories of creativity can be categorized by what is being described as creative—e.g., a person, a process, or a product or similar outcome of creativity—while also considering the external factors that foster or thwart creativity.¹⁰¹ Focusing on a person’s skills and abilities could involve studying personality and motivation. Examining the creative process could call for a multistage perspective, discussed in more detail below. For example, Csikszentmihalyi and Sawyer have used a systems theory approach that studies the interactions among the individual, experts and others in the field, and the rules and processes of the domain or discipline that all those involved occupy.¹⁰² With regard to creative products, however, U.S. cognitive psychologist Mark Runco points out that studying creative outcomes—such as written narratives, art works, scientific discoveries, and architectural designs—frequently tells researchers less about creativity and more about productivity.¹⁰³ Hence, from a scholarly perspective, it is more beneficial to focus on the creativity process than on creative products. External factors to be considered, since they foster or thwart creativity, include the influences of culture, the organization, friends, and family, as well as the interactions between the individual and these external influences.

Information Processing Theories of Creativity

The information processing approach for explaining the process of individual creativity began with British social psychologist Graham Wallas in the early 20th century and his writings have remained influential.¹⁰⁴ In his book, *The Art of Thought*, Wallas outlined a four-stage model of creativity: preparation, incubation, illumination, and verification.¹⁰⁵ Preparation centers around the conscious use of science and mathematics to study a problem. Incubation involves two facets: (1) the individual does not consciously think about the problem to be solved, and (2) the unconscious plays a role in mulling over the problem. Illumination follows incubation, as an unexpected flash of insight; indeed, illumination is the same phenomenon as insight.¹⁰⁶ Verification resembles preparation in that it involves the conscious and deliberate use of science and mathematics to ensure the problem has been resolved.

Follow-on two- and three-stage models of creativity have evolved from Wallas's initial concept. Two-stage models include a first stage of ideation and a second stage of combinations emerging into consciousness, where insight occurs.¹⁰⁷ Three-stage models include an additional stage of evaluation or elaboration, in which the insight is further developed into knowledge that is communicated.¹⁰⁸ U.S. psychologist Donald T. Campbell influenced the development of three-stage models in the mid-20th century through his Darwinian theory of human creativity.¹⁰⁹

In their literature review of multistage individual creativity models, however, Csikszentmihalyi and Sawyer have found these models generally consist of Wallas's four stages, albeit with slightly different labels for the third and fourth stages.¹¹⁰ The first stage is the preparation activity, which is inspired by an external pressure or internal motivation and requires the individual to cognitively study or analyze the topic. This cognitive activity lays the groundwork for the subconscious—that part of the mind not currently the focus of an individual's attention, but still available to influence the conscious mind—to participate. The second stage is the incubation, where mental activity below the level of consciousness is at work. The third stage is insight, where the subconscious merges or selects ideas that arise into consciousness. The fourth stage is the conscious analysis and evaluation of the insight for its value in solving a problem. This evaluation is transformed into language that allows the solution and knowledge to be shared with others.

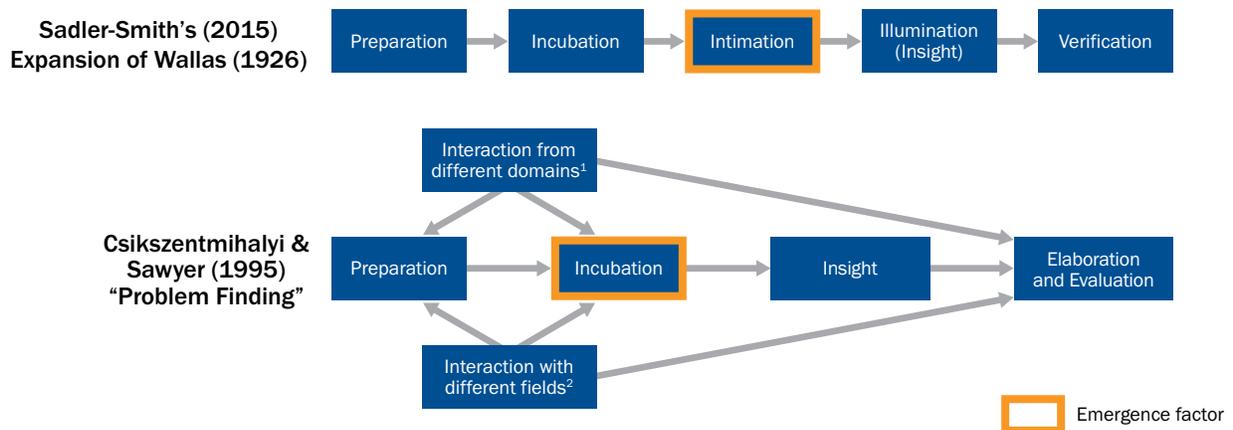
Two Key Information Processing Theories of Creativity

British organizational behavior scholar Eugene Sadler-Smith expands the Wallas model into a leading information processing theory of creativity,¹¹¹ while Csikszentmihalyi and Sawyer offer a second theory,¹¹² which they label “problem finding” and which introduces a social component to the process (discussed in detail below). Both theories provide information processing-related, end-to-end staged models. Both include an emergence factor just prior to insight. Figure 2 depicts these two theories of creativity, featuring the emergence factors of intimation and incubation, respectively.

In the first theory, Sadler-Smith suggests that Wallas actually introduced a five-stage information processing model because Wallas discussed a fifth element, which he called intimation, in his 1926 book, *The Art of*

Thought.¹¹³ However, Wallas did not include Intimation in his four-stage model for reasons not known: "... the four stages of Preparation, Incubation, Illumination, and the Verification of the final result can generally be distinguished from each other."¹¹⁴ In Sadler-Smith's reconceptualization of the Wallas model, the five-stage model includes the original four stages and adds intimation between incubation and illumination.¹¹⁵

Figure 2. Two Information Processing Theories of Creativity



¹ A domain is the culture, policies, processes, rules, and procedures that influence whether an individual's idea is acceptable.

² A field is the collection of persons who have a voice in whether the new idea should be accepted because they operate within the individual's environment.

Author's figure based on the following sources: Eugene Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process: More than Meets the Eye," *Creativity Research Journal* 27, no. 4 (2015): 342-52, <https://www.tandfonline.com/doi/abs/10.1080/10400419.2015.1087277>; Mihaly Csikszentmihalyi and Keith Sawyer, "Creative Insight: The Social Dimension of a Solitary Moment," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 329-63.

Intimation happens just prior to insight and is described by Wallas as a feeling of a growing or emerging series of connections moving toward consciousness—an experience that occurs between the unconscious and the conscious.¹¹⁶ Wallas has further stated that intimations include not only a cognitive component but also an emotional influence that could either initiate the intimation or contribute to its path.¹¹⁷ Sadler-Smith suggests that intimation is similar to intuition,¹¹⁸ which has an emotional component.¹¹⁹ Intimations, therefore, occur within an individual, have both emotional and cognitive components, and serve as the emergence factor that leads to insight.

In developing the second theory, Csikszentmihalyi was influenced by two schools of thought—biological ecosystem (i.e., based on evolution) and symbolic interactionism (i.e., based on the symbolic meaning that people develop and build upon in the process of social interaction)—which led him to conceptualize the process of creativity through an information systems perspective.¹²⁰ The core extension of this perspective is that individuals operate within a social context, which influences individual creativity.¹²¹ This social perspective considers the individual, as well as two kinds of social factors within the individual's environment. One social factor is the field, or the set of other persons who work in the same discipline or domain as

the individual and make statements about whether the new idea should be included in the discipline or domain. Csikszentmihalyi calls these persons “the gatekeepers.”¹²² The other social factor is the discipline itself, with its culture, policies, processes, rules, and procedures that influence whether the individual’s new idea is acceptable. Csikszentmihalyi calls this factor “the domain.”¹²³ The individual, field, and domain interact through an iterative process.¹²⁴

From these concepts, Csikszentmihalyi and Sawyer have created a socially-embedded theory of creativity in individuals involving four stages: preparation, incubation, insight, and evaluation/elaboration. Their research indicates that two parallel versions of this four-stage theory are in operation, depending upon the nature of the first and last stages of the creativity process. If the problem is well-known in the preparation stage to the individual and to other persons within their discipline or domain, then the insight will more easily and quickly be found. Csikszentmihalyi and Sawyer give the label of “presented problem-solving process” to this short-term framework, for the kind of everyday, routine types of problems one encounters and for which applying known procedures leads to a solution.¹²⁵

If the problem is ambiguous and not well-framed by the individual or others in their domain, then the formulation of the problem will be grasped only during the insight stage. Csikszentmihalyi and Sawyer give the label of “discovered problem-finding process” to this long-term framework, for those more revolutionary, paradigm-changing problems.¹²⁶ The conceptual boundary between these two problem processes is not black and white, and each involves many feedback loops.¹²⁷ As a result, these two processes represent the extreme ends of a creative problem-solving spectrum, with many additional processing permutations possible between them.

Returning to Csikszentmihalyi and Sawyer’s presented problem-solving process, the individual is faced in the preparation stage with a fairly straightforward conceptualization of a problem or challenge.¹²⁸ During the incubation stage (i.e., the filtering mechanism from the conscious into the subconscious), the individual steps away from the problem—consciously creating idle time—and allows the subconscious self to mull over the problem; the individual cannot avoid the influence of the social and cultural environment encompassing other persons and policies, rules, procedures, and processes within the individual’s discipline or domain. The complexity of the incubation stage is relatively minimal in the presented problem-solving process because fewer types of information are needed from others and fewer deviations from the norms of the domain exist. In the insight stage, the individual sees a solution, typically within the framework of the discipline or domain, and the insight is more incremental than revolutionary. The evaluation stage involves reverse filtering from the subconscious into the conscious mind of the individual, and it is influenced by others in the field and the policies, rules, procedures, and processes within the domain. The solution is then applied in a fairly straightforward manner, with little resistance.

In Csikszentmihalyi and Sawyer’s discovered problem-finding process, where the nature of the problem is unclear or uncertain, the individual experiences cognitive dissonance or intellectual discomfort, as well as emotional anxiety, because the framing of the problem does not fit within the views of others and because the policies, rules, procedures, and processes of the domain do not address it, at least not completely.¹²⁹ During the incubation stage, the individual relies more intensely upon idle time and the subconscious,

as well as upon a greater diversity of new information and persons associated with different disciplines or domains. Incubation in the discovered problem-finding process, therefore, involves more complex and uncertain interactions with the individual's social environment and a more challenging cognitive component than it does in the presented problem-solving process.

Incubation also plays a key role in the four-stage Wallas model and Sadler-Smith's five-stage reconceptualization of the Wallas model, as well as Csikszentmihalyi and Sawyer's information processing model.¹³⁰ The incubation stage is considered a critical step in the creativity (and insight) process in all three models. Both Wallas and the team of Csikszentmihalyi and Sawyer have described incubation as an opportunity to be free from thinking about the problem at hand and, during that free time, nothing else distracts the individual.¹³¹ As Wallas has suggested, unconscious—but important—mental events occur during incubation.¹³²

Continuing with Csikszentmihalyi and Sawyer's theory, the insight stage of the discovered problem-finding process arrives when the individual sees the formulation of the problem—in stark contrast to seeing the solution, as is the case in the insight stage of the presented problem-solving process.¹³³ The last stage, elaboration and evaluation, is also more complex in the discovered problem-finding process than it is within the presented problem-solving process, because the individual faces communication and language challenges. The individual, both within oneself and in interactions with others, often finds it difficult to formulate a sufficiently clear narrative so that all in the field or domain understand the insight. Once accepted, however, the solution is implemented. Problem finding has been empirically shown to be correlated with creativity.¹³⁴

Antecedent Conditions Affecting Creativity

At the individual level of analysis, Csikszentmihalyi and Sawyer suggest that, for creativity to occur, the following attributes must exist within an individual: an extensive familiarity with the knowledge domain; significant experience within the field associated with that knowledge domain; the ability to focus attention on various aspects of the domain that are known, or suspected, to have an unresolved issue; the ability to absorb knowledge that relates to the unresolved issue; the ability to allow other kinds of information from different domains to subconsciously mingle with knowledge within the individual's domain expertise relevant to the unresolved issue; the ability to sense new problem representations and solutions as a result of this interaction; and the ability to formulate the insight into language that makes the insight understandable and agreed upon by others in the field.¹³⁵ U.S. psychiatrist Albert Rothenberg has added the following factors: the motivation to create something new; an interest in both finding the problem and solving it; a willingness to deviate from the accepted knowledge of those in the field; a certain forcefulness in one's stance; openness to learning and a high degree of curiosity; willingness to take risks; and courage and passion.¹³⁶

At the leadership level of analysis, Scott Isaksen and Hans Akkermans, European scholars with the Creative Problem Solving Group, have identified nine dimensions that leaders can directly influence to foster a creative climate.¹³⁷ First, support for a challenging and involving environment promotes higher levels of employee engagement, commitment, and motivation. Second, freedom is reflected in the degree of independence allowed by managers, as measured by employee autonomy and individual ability to maneuver

independently. Third, trust and openness foster emotional safety in relationships, ensuring individuals feel safe to share ideas and be honest. Fourth, idea-time recognizes that time should be available for individuals to talk about new ideas. Fifth, playfulness and humor provide a relaxed atmosphere and lower stress. Sixth, leaders can lower personal and emotional conflict, which unchecked can lead to disruptive behavior. Seventh, idea support, particularly in the treatment of new ideas, encourages individuals to listen as ideas are discussed in a professional and attentive manner. Eighth, welcomed debate between points of view allows a diversity of voices to be heard and to contribute. Ninth, a tolerance for risk-taking helps individuals feel comfortable putting forward new ideas in an environment with uncertainty and ambiguity.

At the organizational level of analysis, Runco has identified the following behaviors that organizations can foster to support creativity: respect for new ideas; reduction of bureaucratic red tape; not setting policy and process constraints that would inhibit creativity; providing sufficient freedom of intellectual movement of employees; having access to resources, if necessary, to explore new ideas; having an appropriate culture that fosters originality; and providing constructive and developmental feedback to employees.¹³⁸ British organizational psychologist Neil Anderson and his colleagues have reported research indicating the importance of an organization's structure in supporting creativity; that is, organizations that are decentralized, are not mired in a culture committed to organizational and resource power over others, and do not have overly constraining formal processes and procedures foster greater creativity in their workforce.¹³⁹

U.S. organizational behavior scholar James March has identified three ways that organizations promote creativity in individuals. First, the organization is not overly controlling in its attitude toward individuals investigating new ideas.¹⁴⁰ This slack, as March called it, desensitizes the organization's fear of failure and management's inclination to heavily influence and judge the initiation of a new idea.¹⁴¹ Second, managers jointly develop new ideas with employees. In this way, not only the employee benefits, but the manager also learns to be more supportive of new and/or risky ideas. Third, managers support the new ideas of their employees, even in the face of competitive or conflicting ideas from others in the organization.

From an information processing perspective, environmental factors within the IC's organizations affect the individual intelligence analyst's ability to be creative. The reflective learning conditions cited by Csikszentmihalyi and Sawyer, in which individuals are not overwhelmed by information overload, the number of tasks, or shortness of deadlines, could fuel the intelligence analyst's ability to think deliberately about a complex and, as perceived, ambiguous or unresolvable task at hand.¹⁴² Largely inwardly focused—where the individual's imagination, mindfulness, and inventiveness emerge—reflective learning supports the solving of complex, wicked problems.¹⁴³ Well-respected national security experts have stated that high overload and high equivocality environments are typical for individuals in some information-rich national security and law enforcement contexts.¹⁴⁴ Their observations suggest that reflective learning and creativity are not likely to occur in contexts where analysts are overloaded with tasks or in a crisis situation where ambiguity is combined with time pressure. The above Literature Review, however, offers a framework for examining instances of insight in the IC environment, as will be discussed in the next section.

Research Methodology

Conceptual Framework

The key information processing theories of insight and creativity, discussed above in the Literature Review, provide a useful conceptual framework for studying insight in the IC. Taken together, Klein, Csikszentmihalyi and Sawyer, Sadler-Smith, and Ohlsson have identified at least four emergence factors leading to insight: changing the narrative via anchors and stories,¹⁴⁵ incubation,¹⁴⁶ intimation,¹⁴⁷ and restructuring.¹⁴⁸ These four factors express themselves in different ways: taking place either solely within the individual or within the social environment as well as the individual, and including either solely the cognitive component or both emotional and cognitive components of the individual. We can, therefore, place these four factors along two dimensions: the dimension from whence insight emerges (i.e., the emotion-cognition continuum) and the dimension with whom insight emerges (i.e., the individual-social continuum). These four factors and the two dimensions are summarized in Table 1.

Table 1: Emergent Factors from the Information Processing Literature on Insight

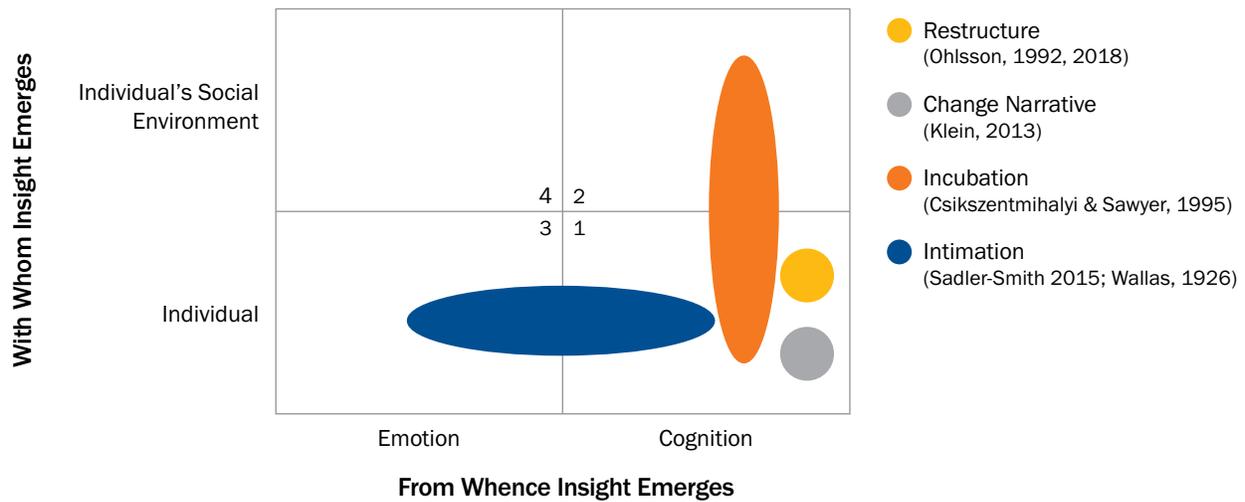
Emergent Factor	Source	Description	Emotion/Cognition Dimension	Individual/Social Dimension
Change Narrative	Klein (2013)	The individual resolves inconsistency in ideas, concepts, etc. by changing the narrative—the story that the individual creates to communicate meaning—which, in turn, can change viewpoints about a situation. The individual changes the way the situation is framed by adding, subtracting, manipulating, etc. the story’s anchors.	Cognition	Individual

Emergent Factor	Source	Description	Emotion/Cognition Dimension	Individual/Social Dimension
Incubation	Csikszentmihalyi & Sawyer (1995)	The individual relies on access to idle time and the subconscious, as well as the diversity of new ideas, concepts, etc. from the problem's own or different disciplines. The new ideas emerge both from within the individual and from other persons in those disciplines.	Cognition	Individual and Social
Intimation	Sadler-Smith (2015); Wallas (1926)	The individual senses a growing or emerging series of connections among ideas, concepts, etc. moving from the unconscious (i.e., incubation stage) toward consciousness (i.e., illumination/insight stage). These connections may be emotionally stimulated or an emotional response may be stimulated by the series of connections of ideas, concepts, etc.	Emotion and Cognition	Individual
Restructuring	Ohlsson (1992, 2018)	The individual re-represents the initially conceived problem and that re-representation is used to overcome cognitive conflict. The individual can restructure the problem by paying more attention to the problem, by considering some less considered representation, and/or by relaxing a self-imposed constraint.	Cognition	Individual

Sources: Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (New York: Public Affairs, 2013), 27-28; Mihaly Csikszentmihalyi and Keith Sawyer, "Creative Insight: The Social Dimension of a Solitary Moment," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 329-63; Eugene Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process: More than Meets the Eye," *Creativity Research Journal* 27, no. 4 (2015): 342-52, <https://www.tandfonline.com/doi/abs/10.1080/10400419.2015.1087277>; Graham Wallas, *The Art of Thought* (London: J. Cape, 1926), 79-107; Stellan Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," in *Advances in the Psychology of Thinking*, ed. Mark T. Keane and Kenneth J. Gilhooly (Hempstead, UK: Harvester Wheatsheaf, 1992), 1-44; and Stellan Ohlsson, "The Dialectic between Routine and Creative Cognition," in *Insight: On the Origins of New Ideas*, ed. Frederic Vellee-Tourangeau (New York: Routledge, 2018), 8-29.

Figure 3 further illustrates where the four emergence factors are located within the two dimensions. Both restructuring and changing the narrative via anchors and stories reside at the intersection of cognition and the individual, as shown in cell 1. Incubation is also cognitive but spans across the individual and the social, as shown in cells 1 and 2. Intimation spans across emotion and cognition, and resides within the individual, as shown in cells 1 and 3.

Figure 3. Framing the Information Processing Literature: Two Dimensions of Insight Emergence



Author's figure based on the following sources: Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (New York: Public Affairs, 2013), 27-28; Mihaly Csikszentmihalyi and Keith Sawyer, "Creative Insight: The Social Dimension of a Solitary Moment," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 329-63; Eugene Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process: More than Meets the Eye," *Creativity Research Journal* 27, no. 4 (2015): 342-52, <https://www.tandfonline.com/doi/abs/10.1080/10400419.2015.1087277>; Graham Wallas, *The Art of Thought* (London: J. Cape, 1926), 79-107; Stellan Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," in *Advances in the Psychology of Thinking*, ed. Mark T. Keane and Kenneth J. Gilhooly (Hempstead, UK: Harvester Wheatsheaf, 1992), 1-44; and Stellan Ohlsson, "The Dialectic between Routine and Creative Cognition," in *Insight: On the Origins of New Ideas*, ed. Frederic Vellee-Tourangeau (New York: Routledge, 2018), 8-29.

This section includes a discussion of methodological considerations, the selected methodology, sample selection strategy, data collection, and data analysis. The approach taken is primarily phenomenological. The particular method applied is qualitative, using interviews and grounded theory for data analysis.

Key Questions

The fundamental question is how to study insight—in laboratory or real-life conditions—with the key corollary of how to focus the study so the lessons learned are applicable to the IC. There are at least three disciplinary approaches to study insight: how insight is measured under laboratory conditions; how it is experienced in real-life conditions; and what is known from historical accounts of specific individuals who have experienced insight.

Most cognitive psychologists studying insight have relied on experimental methods conducted under controlled laboratory conditions. These studies have often constructed the experiment so that the insight activity takes seconds or minutes.¹⁴⁹ The participants in such laboratory experiments have almost always been college students, and the activity in which they have engaged is some kind of puzzle.¹⁵⁰ Researchers attempt to remove all possible intervening variables and focus on just one isolated aspect of insight in which the

subject of the experiment has had no preparation.¹⁵¹ When priming has been included in the experiment, its effect is measured in seconds or minutes.¹⁵² These constraints have led Swedish psychologist Eva Lund to observe that insight is hard to study experimentally.¹⁵³

Social psychologists and organizational scientists, in contrast, view insight as occurring within an ecology of factors that exist only in real-life situations and are influenced by other people, things in their environment, an individual's perceptions, the varying intensities of factors in the environment, and the narratives that individuals construct.¹⁵⁴ Timing in real-life situations is much longer than seconds or minutes; the effect of priming, for example, is assumed to span hours or days or longer.¹⁵⁵ One method problem with researching insight and creativity in real life is the difficulty of predicting their appearance and, because of the time lags involved, of determining that the end result has constituted an insight.¹⁵⁶

Historical accounts of insight and creativity have been collected through the stories that specific kinds of people tell about their lived experience.¹⁵⁷ Rothenberg has interviewed Nobel Prize-winning scientists about the creative process that led to their recognition.¹⁵⁸ Klein and Jarosz have primarily read accounts and had conversations with other researchers about individuals who were involved in critical incidents.¹⁵⁹ Csikszentmihalyi and Sawyer have interviewed individuals recognized for their creative contributions in various fields spanning science, art, business, politics, and the social sciences.¹⁶⁰ Human development scholar Kevin Dunbar has interviewed scientists from laboratories known for making creative discoveries. Each of these qualitative research efforts has had the advantage of an external measure that recognized the individual's insight and creativity.¹⁶¹ For example, Nobel Prize winners are carefully selected by an independent group based on the recipient's creative contribution. Although a Nobel Prize winner is thus a perfect candidate to interview to learn about the creativity experience, the available and limited historical research has not been representative of the intelligence analyst environment.¹⁶² Hence, a different approach—one applicable to intelligence analysts—is needed.

Research Design

Phenomenology informs a new approach that is applicable to intelligence. The unit of analysis for a phenomenologist is not the individual, *per se*; rather, it is how a phenomenon reveals itself in an individual's life.¹⁶³ A phenomenologist is interested in how a phenomenon emerges and evolves. The goal of this phenomenological effort is to "...uncover and describe the structures, [and] the internal meaning structures..." of the insight process as experienced by the individual.¹⁶⁴ A phenomenological investigative approach to understanding insight emergence is recommended because the unpredictable nature of insight emergence makes it hard to observe as it occurs.¹⁶⁵

Of the two main phenomenological approaches—bracketing and bridling—bracketing is the attempt to remove the researcher's knowledge about the phenomenon under study. Bridling leaves the researcher open to factoring in preexisting knowledge, and this openness allows the researcher's understanding of the phenomenon to evolve during the study.¹⁶⁶ Bridling is the more accepted and current approach used by researchers.¹⁶⁷ This study adopts the bridling approach because the topic of insight in intelligence analysts is not empirically understood in its context and, therefore, requires an open and thoughtful mind to understand its manifestation.

Conducting Phenomenological Research

The use of a phenomenological approach has been recommended for the study of national security issues.¹⁶⁸ Introducing phenomenology-based research into the world of U.S. intelligence analysts and their decision-making customers, however, presents unique challenges. The primary one is conducting unclassified interviews with individuals who live and work in a classified environment. To address that challenge in this study, analysts were informed prior to being interviewed that their involvement required them to obfuscate anything classified. Instead of revealing a country or a foreign adversary, the interviewee would say “Country X” or “a senior decisionmaker in that country,” respectively. In addition, details about the interviewees—e.g., their names, names of individuals with whom they interact, names of places where they work, and names of organizations mentioned by them in their stories—were anonymized because they were irrelevant; the focal point was the phenomenon, not the identities of the actors and their locations in time and space.

Three prior phenomenological research studies conducted by this author have informed this project. Each of these prior studies focused on how intelligence analysts and their customers process intelligence information within complex national security contexts, all through unclassified interviews. The first study encompassed the President’s Daily Brief (PDB) briefers and their interactions with the nation’s most senior policymakers who receive the PDB.¹⁶⁹ Interviews of PDB briefers showed they provide creative, sense-giving support to the most senior policymakers in the United States through meta-information.¹⁷⁰ Meta-information is a phenomenon that provides value-added information to help policymakers link the intelligence from the PDB to their decision cycles. The second study involved interviewing active duty and retired three- and four-star Army combat-arms generals who commanded large formations in Iraq and Afghanistan.¹⁷¹ The study examined how these generals consumed strategic intelligence, mostly from the Defense Intelligence Agency (DIA) and Central Intelligence Agency (CIA), and found this strategic intelligence provided information that at times contradicted the generals’ understanding of the on-the-ground world in which they operated. This discontinuity triggered the phenomenon of creative problem-solving that engaged the generals in a self-learning, critical thinking, and social engagement strategy to resolve the contradictions, which they did.

The third study involved the phenomenon of how intelligence analysts learn, i.e., how their mental models change amid the effects of overload and equivocality in their everyday analytic tasks of informing policy decisionmakers. This study found these effects produce four learning archetypes—collaborative, focused, survival, and reflective—which affect the knowledge analysts produce and deliver to intelligence consumers.¹⁷² In collaborative learning, there is parity and joint co-discovery between the two worlds of analysis and policy. This expands knowledge for both although their depth of understanding is constrained to the degree that each world can absorb the unique dimensions of the other as well as its own. In focused learning, the analyst successfully mitigates impediments to paying attention to their task at hand, and thereby achieves greater, in-depth cognitive focus on their area of specialization. In survival learning, the analyst operates in a chaotic environment, must act quickly, and lacks awareness of the full extent of factors affecting the environment—all leading the analyst to employ methods that reduce disorder at the cost of in-depth cognitive understanding and that draw upon what they already know. In reflective learning, the analyst uses time to think introspectively—conducive to being innovative and solving complex, novel problems—and creates new meaning amid ambiguity.

Collectively, the three phenomenological studies described above provided experience and expertise in dealing with individuals who willingly share unclassified personal stories about themselves and their experiences within a national security context. The participants in these research studies judged it valuable to pursue such research for the benefit of national security, their profession, and the professional development of members in their community.

Selection of Qualitative Method

How insight and creativity emerge and are sustained within intelligence analysts probably involves a novel and complex social setting, which has important implications for determining a research methodology.¹⁷³ A naturalistic inquiry is needed to reach a deep and rich understanding of the contextual differences within and between individuals. The pursuit of this type of knowledge justifies the use of an idiographic qualitative research method, in which descriptions of and revelations about a phenomenon—such as insight—may be discovered.¹⁷⁴

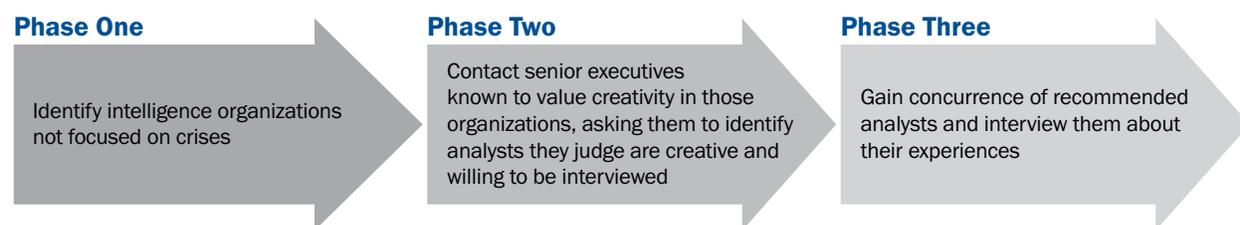
Although a variety of analytic methods are available, phenomenology and grounded theory use the analysis of experiences that are gleaned through interviews with individuals focused on the phenomenon. Grounded theory is a pragmatic, but not prescriptive, process¹⁷⁵ that allows the researcher to make inferences based on abductive reasoning, moving iteratively from data to theorizing and back to data.¹⁷⁶ In addition to the three studies mentioned, grounded theory has been applied previously as a research tool in national security and intelligence studies.¹⁷⁷ For example, Israeli military intelligence officer Eran Zohar has used grounded theory to understand the operational readiness of the Taliban in Afghanistan.¹⁷⁸

Data Collection Strategy

Sample Selection Strategy

No formal recognition system—no award like the Nobel Prize—has been designed specifically to recognize insight or creativity in intelligence analysts. Identifying individuals to interview about their insight experiences, therefore, required an alternative approach involving informal recognition. Using a three-phase selection strategy, which was both homogeneous and purposeful,¹⁷⁹ individuals who had experienced the study's key phenomenon—insight—and who occupied the same domain—intelligence analysis in the national security sector—were identified. Figure 4 summarizes the three phases involved in the sample selection strategy.

Figure 4. Three-phase Sample Selection Strategy



Phase One

As noted above, insight and creativity within intelligence analysts who are engaged full-time in solving novel problems can flourish in reflective learning work environments.¹⁸⁰ Hence, the first phase of study-participant selection focused attention on those contexts in which insight and creativity may most likely occur. One such environment is found where analysts are not crafting high-demand, quick-turnover daily production, as typically occurs in a war zone or when assigned to a crisis account. Candidates could be based at an intelligence agency headquarters—assigned, for example, to functional topics such as climate change and the urbanization of populations—or in the intelligence directorate of a combatant command not engaged in hostilities. A second prospective environment includes organizations focused on scientific endeavors. Scientific and technical intelligence centers—including the Air Force’s National Air and Space Intelligence Center, the Army’s National Ground Intelligence Center, the Navy’s Office of Naval Intelligence, and DIA’s Missile and Space Intelligence Center and National Center for Medical Intelligence—or the science-based National Geospatial-Intelligence Agency (NGA) could be good sources of insight study candidates. A third set of prospective candidates could be drawn from the strategic intelligence function at CIA or DIA, while a fourth could comprise analysts participating in training and education programs, including students who attend the National Intelligence University.

Phase Two

The second phase involved making contact with current senior executives and senior analytic managers in the intelligence analysis field who are known for appreciating the value of insight and creativity. A snowball approach was used to search for such executives and managers,¹⁸¹ drawing on the author’s personal network within the first three types of work environments described in Phase One. The goal of Phase Two was for these executives to facilitate the identification of analysts or working-level managers of analysts whom they judged to be creative; the analysts would then be asked about their specific insights.

To start, the executives and senior managers were provided either a verbal or written summary of the characteristics of a creative person, based on the six major elements that Sternberg identified in his article on “A Three-Facet Model of Creativity.”¹⁸² These elements combine attributes of intelligence, cognitive style, and personal motivation. First, the individual is not bound by conventionality and may be characterized as a free spirit or as unorthodox. Second, the individual is able to intellectually integrate disparate types of information, i.e., is known to make connections between ideas, can articulate differences between ideas, and is able to consider old or existing ideas and information and combine them in new ways. Third, the individual appreciates beauty and imagination. Fourth, the individual is intellectually flexible, as demonstrated by being skilled at making decisions after weighing pros and cons, but also able to revise those decisions and pursue alternate approaches. Fifth, the individual has a keen sense of inquiry, revealed by freely and regularly questioning norms and assumptions, and, when arriving at an alternate view, not backing down in the face of peer or management pressure. Sixth, the individual has determination, is enthusiastic, and is motivated intrinsically by personal goals.

Phase Three

This third phase involved contacting those intelligence analysts identified by the executives and senior managers in the second phase. The estimated minimum sample size for phenomenological and grounded theory research designs is not overly prescriptive,¹⁸³ with the number of interviewees recommended to make analytic generalizations being between 20 and 50.¹⁸⁴ The executives and senior managers collectively provided the names and email addresses of 42 intelligence analysts, but only after the intelligence analysts were advised of the research project and agreed to be interviewed. Of the 42, one analyst denied having agreed to participate. Of the 41 analysts remaining, 37 agreed to be interviewed after learning the types of questions to be asked. However, one of the interviews was not used because the insight described was not work-related, resulting in 36 usable interviews. All analysts consented to a verbal consent form.

How Interviews Were Conducted

The 36 interviews were conducted over a three-month period between November 2020 and January 2021. Prior to the interviews, analysts were asked to have in mind a specific cognitive and/or emotional insight experience while solving a problem that was novel to them. Insight was defined for them as their recognition that they had achieved a deeper understanding about a topic than they previously had, leading them to understand the topic, the world, and/or themselves differently. At the interview, analysts were told that the questions to be asked would explore in depth their selected insight experiences.

The interviews, which averaged 60 minutes, used a semi-structured interview guide, with very little deviation. Analysts were asked to describe what type of intelligence analyst they were, to identify an insight that would be the subject of the interview, how they thought about the problem prior to the insight, what happened between the time they thought about the problem and when the insight occurred, how long the problem occupied their attention, what led them to an insight and what was the insight, what happened after the insight, and if there was anything else not already addressed that they wished to say. Follow-on, probing questions were posed, as needed. Collectively, the answers to the interview questions were referred to as the analyst's "insight story."

The interviews were conducted virtually, primarily because of the physical distancing constraints imposed by the COVID-19 pandemic. Of the 36 interviews, 11 were conducted using the interviewee's office phone, 12 using the interviewee's cell phone, and 13 using the Microsoft Teams teleconference application in either audio-only or combined audio-video mode. Respondents were guaranteed anonymity and confidentiality for themselves as well as any correlation to or identification of other individuals, groups, organizations, countries, etc., that they mentioned in the interview.

Based on the author's experience in three previous research studies mentioned above, this study continued the past practice of not recording interviews. People in the intelligence business are more prone to speak freely and comfortably when no verbatim record of their interview is made. Instead, the author wrote down information from the interviews in a notebook, following a strategy involving four interactions with the

interview data: listening to the analyst’s words, deciding what to write down,¹⁸⁵ writing in the notebook, and transcribing the interview data onto the computer. Should this fourth stage identify points missed, all interviewees had agreed to respond to follow-up questions.

Interviewee Demographics

Of the 36 interviewees, 18 were assigned to one of four intelligence agencies: CIA, DIA, NGA, and ODNI. Five were assigned to the Executive Department’s intelligence offices of Treasury and Energy. Thirteen were assigned to intelligence directorates (with the “J2” functional designation for a headquarters that is composed of “joint,” multi-service elements consisting of land, air, and naval forces) within combatant commands and the Joint Staff: Cyber Command (CYBERCOM), European Command (EUCOM), Southern Command (SOUTHCOM), Strategic Command (STRATCOM), and the Joint Chiefs of Staff (JCS). During their interviews, some analysts selected an experience—their insight story—from a previous assignment at an organization different than their current affiliation. Table 2 provides more details.

Table 2: Analysts’ Organizations at Time of Interviews and Insight Experiences

Organizational Type	Intelligence Entity	Organization Assigned When Interviewed	Organization Assigned During Insight Story
Intelligence agency	CIA	2	2
	DIA	8	8
	NGA	2	0
	ODNI	6	6
Department’s intelligence office	Energy	3	3
	Treasury	2	1
Combatant command intelligence directorate	CYBERCOM/J2	3	2
	EUCOM/J2	2	2
	SOUTHCOM/J2	2	4
	STRATCOM/J2	5	3
	JCS/J2	1	2
Uniformed services intelligence unit	U.S. Air Force	0	1
	U.S. Army	0	1
	U.S. Coast Guard	0	1
TOTAL		36	36

The average years of analytical experience of the intelligence analysts interviewed was close to 15 years, with a standard deviation of about 8.5 years. See Table 3 for details.

Table 3: Interviewees' Years of Analytical Experience

Years of Experience as Intelligence Analyst	Number of Analysts
0-3 years	6
4-6 years	2
7-9 years	4
10-12 years	6
13-15 years	4
16-18 years	4
19-21 years	3
22-24 years	2
25-27 years	1
28-30 years	0
31-33 years	1
34-36 years	2
37-39 years	1
TOTAL	36

Table 4: Interviewees' Graduate Education

Graduate Degree - Discipline	Number of Analysts
Humanities	4
International relations/ Political science	10
Management	4
Policy	2
Science/engineering	3
Social science - other	1
Strategic intelligence	4
TOTAL	28

by intelligence analysts for their assessments. While translation, per se, may not be considered analytical, for purposes of this study, it was. See Table 5 for details.

The gender distribution of the 36 interviewees was 31-percent female (11) and 69-percent male (25). According to official 2019 data, the percentage of women in the IC was 39.3 percent, but that percentage included disciplines other than intelligence analysis.¹⁸⁶ The same report noted that women were underrepresented in

The analysts had a varied history in terms of their work experience. Four of the 36 analysts were uniformed services members. All others were civilian intelligence analysts, and, for many, their current government intelligence job was the only type of related work experience they had. Nine civilian intelligence analysts, however, had previously held private sector jobs, while six had prior military service, almost always in an intelligence capacity. Five of the civilian intelligence analysts had both prior private sector and prior military experience.

With regard to education, 34 of the 36 analysts interviewed had at least a bachelor's degree, and two had an associate's degree. The discipline in which most (13) had majored was international relations or political science, while other social sciences (3), engineering (5), the humanities (5), management (3), physical science (3), and economics (2) were represented in the single digits. Of the 34 with a bachelor's degree, 28 held one or more graduate degrees, of which 25 were at the master's level, and three at the doctoral level. International relations or political science was the dominant graduate program. See Table 4 for details.

The intelligence analyst's career fields during their insight experience covered a broad range of specialty areas spanning analytic applications, analytic tradecraft, financial analysis, infrastructure analysis, international politics, military forces, public health, scientific and technical (S&T) analysis, S&T applications, and strategic warning. Some of these terms require explanation. Analytic applications are activities used to support analysis, and they require expertise in big data, databases, geospatial information systems, network analysis, red teams, and exercises. Analytic tradecraft applies to conceptual clarity and foreign culture effects. S&T applications refer to the English translations of foreign media that are transmitted through various technical means and are used

some agencies' intelligence occupations, including both analysts and collectors. Although this study interviewed only analysts, the proportion of women participants appears to be somewhat representative of women working in the IC.

Analytic Strategy

Characterization of Insight Stories

Information about the analyst's insight story was collected through the interview questions, as described above. The insight experiences took place over time because they started when the problem was identified and ended with the reaction to the insight. Although the analysts were invited to describe whatever insight experience they wanted to share, they tended to select insight experiences from early in their analytic careers or early in a new assignment within their career. Table 6 provides details on when insight stories occurred in the interviewees' careers. Regardless of the experience's vintage, the analysts had remarkably vivid recollections of their insight stories. Almost all analysts interviewed recalled word-for-word conversations and the smallest details of events in their insight story. While scholarly evidence suggests that memory recall degrades over time,¹⁸⁷ more recent evidence indicates that the emotional intensity of an experience in one's past is correlated to its vividness, and as a result, the accurate recallability of the experience.¹⁸⁸

Qualitative Data Coding

Narrative is used in qualitative research to shed light on how a phenomenon develops.¹⁸⁹ In this study, the phenomenon was insight, and interviews provided the narratives about insight. Within these narratives, elements of interest included, but were not limited to, ideas, people, transactions, context, outcomes, process, emotions, and so on. These elements occurred in strings of words within the interviewees' narratives, and this author's interpretation of these strings was called a code.¹⁹⁰ Codes are researcher-generated words or phrases that capture the essence of a narrative's segment. Codes can be used for pattern detection, process identification, categorizations, theory

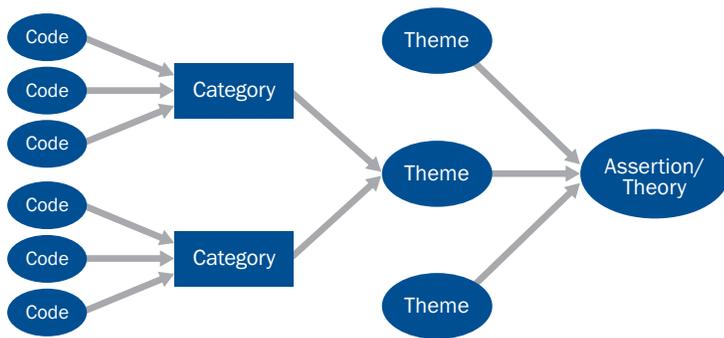
Table 5: Interviewees' Mission Areas During Insight Experience

Mission Areas During Insight Experience	Number of Analysts
Analytic applications	7
Analytic tradecraft	3
Financial analysis	3
Infrastructure analysis	1
International politics	5
Military forces	8
Public health	1
S&T analysis	4
S&T applications	3
Strategic warning	1
TOTAL	36

Table 6: Timing of Insight Stories in Analysts' Careers

Point in Intelligence Analyst's Career of Insight Story	Number of Analysts
0-3 years	15
4-6 years	5
7-9 years	4
10-12 years	3
13-15 years	2
16-18 years	2
19-21 years	2
22-24 years	1
25-27 years	1
28-30 years	0
31-33 years	0
34-36 years	0
37-39 years	1
TOTAL	36

Figure 5. Coding Framework



*Author's figure, derived from the following source: Johnny Saldaña, *The Coding Manual for Qualitative Researchers* (Los Angeles: Sage Publications), 1-40.*

building, and other purposes. Coding is a multistep, iterative process resulting in an assertion or theory.¹⁹¹ Figure 5 summarizes this process, which is further explained below.

The first step in qualitative data coding is to interpret the actual words, phrases, sentences, and/or paragraphs in a narrative. There are many approaches to this first step.¹⁹² For example, the actual word used by the subject could be a code, known as “in vivo.” Most interpretation methods focus, however, on the research-

er's specific interest or set of interests in striving to understand the phenomenon—in this case, insight—and so can be based on a research question. These research interests can include processes, descriptions, values, emotions, or attributes—to name a few—and they may be combined as the researcher deems fit.

The second step consolidates the codes identified in the first step into categories, which are drawn directly from the codes. For example, the codes of “ballpoint pen,” “pencil,” and “marker” could logically be consolidated into the category of “writing instruments.” The third step identifies the categories' theoretical meanings, called themes or concepts. These meanings can be drawn from existing literature, and they represent the structure of an experience. A theme is not in the narrative, like its code or category; rather, it is a characterization the researcher assigns based on the research question.¹⁹³ A theme provides the meaning of a code or category in an effort to understand some aspect of the phenomenon within the analyst's experience and, therefore, it is an abstraction that gives shape to the focal elements being researched.¹⁹⁴

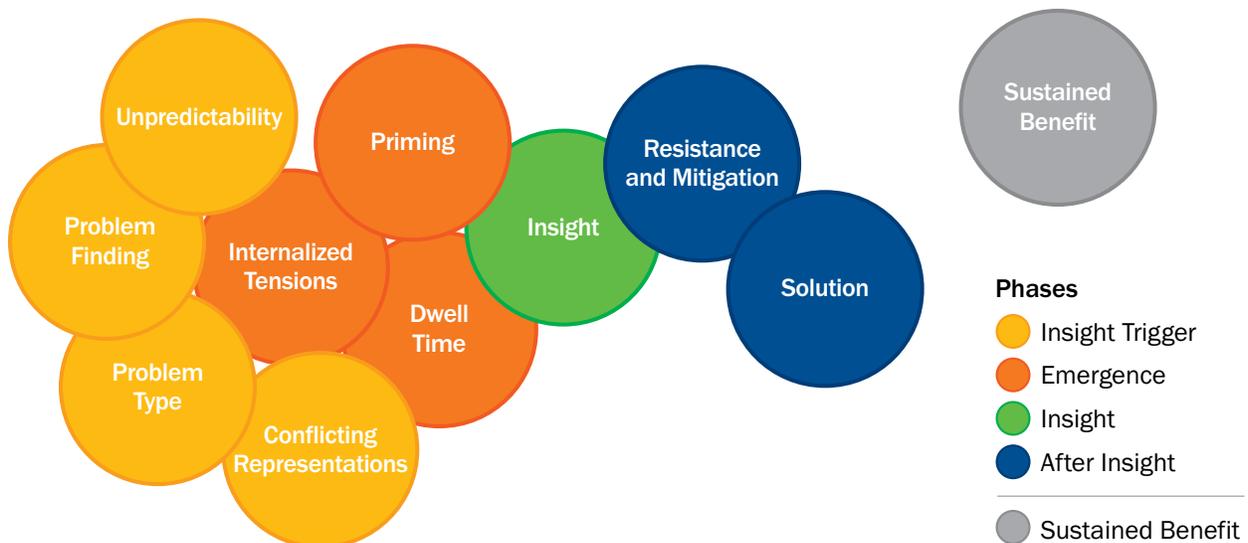
These series of coding steps result in an assertion or theory about the research topic. In this study of insight in the IC, drawing on 36 interviews, the following interpretative elements were generated: 1,421 codes, 66 categories, 11 themes, and four assertions. Excel spreadsheets were used to manage the iterative coding process. The 11 themes that identified aspects of insight were: unpredictability, problem finding, problem type, conflicting representations, internalized tensions, priming, insight, dwell time, resistance and mitigation, solution, and sustained benefit. The four assertions drawn from these themes were: insight emerges within an individual; insight emerges within an individual's social environment; insight emerges from a cognition stance; and insight emerges from an emotional stance. In the next section, Findings, each theme will have an associated evidence table consisting of the theme (and sub-theme, when appropriate), the category, the code, and the sentence from the interview that serves as the evidence.

Findings

Analysis of the author’s interviews with the intelligence analysts revealed an insight process shared by each analyst that was almost identical regardless of their many demographic differences. The coding analysis process created 11 themes, as noted above, and these themes were organized into four proximal phases and one distal phase. Insight trigger, emergence, insight, and after insight are the proximal phases associated with insight within a creativity framework—somewhat similar to the information processing theories of creativity laid out by Csikszentmihalyi and Sawyer (see Figure 2 above)—and sustained benefit is a distal phase, standing outside of time from the proximal phases.

The “insight trigger” phase includes unpredictability, problem finding, problem type, and conflicting representations. Internalized tensions, priming, and dwell time fall into the crucial “emergence phase.” The “insight phase” naturally includes insight, while the “after insight” phase comprises resistance and mitigation, and solution. The “sustained benefit phase” is not part of the information processing framework of insight and creativity; rather, this phase represents the analyst’s distal reflection of the insight’s beneficial impact and meaning to themselves and the contribution they felt they made to their mission. Figure 6 displays the 11 findings divided into four phases plus a sustained benefit phase, and these phases and themes are discussed below in more detail.

Figure 6. IC Analysts’ Insight Process



Insight Trigger

Introduction

The “insight trigger” phase begins with an initiating event that, seemingly by chance, brings the analyst’s attention to a particular problem to address; alternatively, after already working on the problem, a random event contributes to focusing the analyst’s attention more intently on the problem. Once the novel problem surfaces in the analyst’s attention, the strategy shifts a problem-solving to a problem-finding process—that is, as described by Csikszentmihalyi and Sawyer, the strategy best suited to problems that have not been addressed or solved previously and issues that, by their very nature, have no single answer. In the last part of this phase, analysts discover that other individuals almost always represent the problem very differently, culminating in a triggering motivation to resolve these conflicting representations of the problem. Table 7 summarizes each factor within the “insight trigger” phase, which will be discussed below.

Table 7: Summary of Insight Trigger Factors

Insight Trigger			
Unpredictability	Problem Finding	Problem Type	Conflicting Representation
Travel for Work	Check Assumptions	Prediction	Analyst’s View
Attend a Conference	How Things Relate	Mystery	Others’ Views
Attend a Meeting	Overcome Roadblocks		
An Office Task	Sensemaking		
Personal Life			

Unpredictability

At some point within the “before insight” stage, almost every analyst reported experiencing a source of unpredictability, without which the insight story would not have materialized or, at least, have progressed the way it did. The sources of unpredictability were events in which the problem surfaced unexpectedly or without planning. These sources included traveling for work (i.e., temporary duty, or TDY), a conference or other meeting convened locally, an office task assigned by the analyst’s supervisor or more senior manager, and some aspect of the analyst’s personal life.

As an example of unpredictability while traveling for work, an analyst who worked at headquarters visited a field site for a specific purpose. At the field site, the analyst was unexpectedly shown an analytical tool used for a different purpose than the analyst needed, and was then able to rethink how such a tool could help with the problem the analyst had been thinking about occasionally, but without making any progress. At a conference, an analyst met specialists who discussed a material’s dual-purpose, which triggered the analyst to pursue the path that led to the analyst’s insight. A junior analyst, who was a last-minute replacement for a senior analytic leader at a Pentagon meeting comprised of other senior analytic leaders from various intelligence agencies,

spoke up at the meeting and fueled the start of their novel problem-solving and insight. Because of COVID-19 workplace occupancy limitations, an analyst was assigned to the midnight shift where, freed of the usual distractions and interruptions, the analyst was afforded the time and space to arrive at an insight. It should be noted that the free time was not equivalent to Csikszentmihalyi and Sawyer's concept of incubation—i.e., not consciously considering the problem—because the time was used to actively think about the problem. As an example of drawing on personal life, an analyst listened to a podcast on the way to and from work, and information in the podcast led to the analyst's work-related insight. More examples of unpredictability and other insight triggers, as described by the interviewed analysts, are available from the author upon request.

Problem Finding

Analysts described their encounter with the novel problem as one in which they had to figure out how to solve the problem. As discussed in the Literature Review, problem-solving is a straightforward process in which the problem has been defined for the analyst, the process can be repeated with similar problems, and there is an agreed-upon way of solving the problem. The analysts interviewed for this study were not faced with problem solving. All the analysts interviewed used problem-finding processes, which are applied when the nature of the problem is unclear and/or uncertain, and the framing of the problem does not fit with the views of others.

Based on how the analysts described the nature of the uncertainty in their problem finding, their uncertainties can be placed into four broad categories: check assumptions, how things relate, overcome roadblock, and sensemaking. The uncertainties in the *check assumptions* category raised questions about how analysts were thinking about a topic. For example, one analyst had initially framed the approach to an issue in one way, but began to wonder if a different framing would be better after being exposed to another way. The uncertainties in the *how things relate* category raised questions about possibly relevant factors not previously considered. As an example, an analyst who focused on a foreign country from a political perspective wondered if other facets of governing or society would be considered relevant to understanding the activity being assessed. The uncertainties of *overcome roadblock* category raised questions about how to overcome externally- or internally-imposed constraints. For example, an analyst had a lot of information to convey about a complex topic yet was constrained by space and time limitations. Finally, the uncertainties of the *sensemaking* category raised questions about figuring out an activity when the situation was not clear. As an example, an analyst could see that something different was happening between two countries but was not sure what was driving the change or how it was emerging.

Problem Type

Some analysts described specific problems they had not previously experienced, solved, or made significant progress toward solving. These problems were organized into two types: predictions and mysteries. *Prediction* problems were about understanding something that was going to happen or might happen in the future. Prediction problems typically sought to answer *how* or *under what conditions will something*

happen questions about the future. For example, how would an adversary fight? *Mystery* problems, on the other hand, occurred in the present, but they were full of ambiguities and lacked sufficient information to solve.¹⁹⁵ Mystery problems typically sought to answer *why*, *how*, or *where* questions about something happening in the present. For example, where were the weapons that the adversary was hiding? In both types of novel problems, there was no single approach or a priori answer.¹⁹⁶

Conflicting Representation

As discussed in the Literature Review, problem representation refers to how the individual understands the problem and what approach should be used to solve it. Since the problems that the interviewed analysts faced were novel, the analyst's framing of these problems typically did not fit with the views of others. For example, in a prediction problem of "how to find mobile missiles after they leave base," the analyst represented the problem as conceptual, meaning a different paradigm was needed in order to develop a strategy for answering the problem. Others represented the problem as resource dependent, meaning answering the problem (i.e., finding the missiles) was dependent on existing collection resources. The analyst's representation conceived of the prediction problem as constrained by ideas, while the others' representation conceived of the prediction problem as constrained by physical resources.

For a mystery problem, such as "why are enemies improving their military cooperation," an analyst framed the problem by focusing on the details of what was actually happening at that time, whereas others focused on patterns established through historical events. This focus on details in the present led the analyst to see evidence that the two countries were establishing closer relations, which the others could not see due to their focus on historical patterns.

For every analyst interviewed, regardless of whether the problem was a prediction or mystery type, how the analyst represented the problem was always different from how it was represented by others. These conflicting representations triggered an awareness that cognitive differences existed in the analyst's efforts to solve a problem.

Emergence

Introduction

The "emergence" phase begins after the individual represents the novel problem and starts to work on the problem, becoming aware of internal tensions. Tension is the inconsistency between pairs of things that, by themselves, are motivating factors for reducing the inconsistencies.¹⁹⁷ As an example, an organization may create a tension in an employee by requiring its employees to comply with policies and procedures in order to produce standardized processes or outcomes while, at the same time, demanding its employees be innovative in order to change the status quo. For the employee, this tension between the status quo and change will motivate the employee to find a solution that reduces the negative effect of this tension. The emergence phase concludes prior to the insight.

During the study interviews, analysts reflected on experiences that had occurred prior to the novel problems on which they were working. They felt these prior experiences had meaningful aspects that guided their navigation toward resolving the tensions of which they became aware as they worked through their novel problems. Analysts did not say, however, that they were conscious of the meaning of these past experiences while working on their problems. Although these past experiences were unrelated to the problem at hand, an aspect of these past experiences brought forth a combination of emotional and cognitive meaning that informed how the analysts thought in the present about moving through the internalized tensions they faced. This informing of the present by the past is called priming.¹⁹⁸

Internalized Tensions

Each of the analysts interviewed discussed their awareness of multiple internal tensions in the course of working on their problems. The analysts discerned a total of 11 types of tensions, which could be associated with either the cognition or emotion dimension (i.e., the dimensions from which insight emerges, as noted earlier). Cognitively related tensions occurred in abstractions like the analysts' thoughts and ideas. Emotionally related tensions occurred as a result of the analysts' actions and perceived observations of reactions. The 11 types of internalized tensions the analysts experienced could then be further subdivided into either the individual or social dimension (i.e., the dimensions with whom insight emerges). Tensions occurring at the individual level of analysis (e.g., self-related) fell into the individual dimension, whereas tensions occurring at the organizational level of analysis (e.g., structure and behavior) fell into the social dimension.

The analysts experienced six types of cognitively related tensions—framing, interpretation, method, theory, understanding, and function—of which the first five occurred at the individual level and the last occurred at the social level. Analysts experienced five types of emotionally related tensions—articulation of self, expectation of self, integrity of self, bureaucracy, and communication with others—of which the first three occurred at the individual level and the last two at the social level. Table 8 briefly describes the 11 types of internalized tensions experienced by the analysts and where they are placed within the two dimensions.

In the cognition category at the individual level, *framing* involves the individual's recognition of the specific differences between the way one formulates a concept or system to study a problem and the way(s) others do. Recall in the "before insight" phase, problem representation was different between the analyst and others; in this "emergence" phase, however, the analysts are able to articulate their understanding in comparison to how others have framed the problem. As an example, an analyst differentiated between having been trained to view international relations from a state actor perspective while others' views had been informed by their training from a constructivist perspective. *Interpretation* involves the differences in meaning and implications that the analyst and others associate with a problem. For example, an analyst felt a particular novel problem was an important one, whereas others, while acknowledging the problem, felt it was not important. *Method* involves differences in procedure for accomplishing or approaching a problem. For example, an analyst felt that exploring a diversity of ways to represent a problem would lead to the most accurate assessment of a problem, but others believed that having a standardized process

of representing a problem would be best. *Theory* involves having been exposed in the past to a theory or concept but not being able to extrapolate or apply that concept to a current, real-world situation. For example, an analyst was exposed in school to the idea that diversity of perspectives was important but was not able to internalize that idea then or apply it until much later. *Understanding* involves differences in what and how data can be developed into knowledge. For example, although an analyst agreed with others that large data sets were valuable, that analyst judged the data sets' value would lessen without an understanding of the context surrounding the data or its usage.

Table 8: Internalized Tension Types Within Each Dimension

Internalized Tension			
Dimension	Dimension	Name	Description
Cognition	Individual	Framing	Recognition of the different ways analysts and others formulate a concept or system in order to study a problem.
		Interpretation	The differences in meaning and implications associated with a problem.
		Method	The differences in procedure for accomplishing or approaching a problem.
		Theory	Being exposed in the past to a theory or concept but not being able to extrapolate or apply it to a real-world situation in the present.
	Understanding	The differences in what and how data can be developed into knowledge.	
	Social	Function	Recognition of the differences in how organizational structure, process, and/or mission affect views of the problem.
Emotion	Individual	Articulation of Self	The differences in the realization that one's language, whether spoken or written, plays an important role in the analytic domain.
		Expectation of Self	Recognition that differences in one's assumptions, values, conclusions, etc. have an impact on one's thinking.
		Integrity of Self	Recognition of the difference between right and wrong.
	Social	Bureaucracy	Recognition of the different influences that an organization's uniformity and control can have.
		Communication with Others	The differences surrounding communication of analysis with others in one's environment.

In the cognition category at the social level, *function* involves the individual's recognition of the differences in how organizational structure, process, and/or mission affect the views of the problem held by oneself and others within one's social environment. As an example, an analyst who was skilled in the subject matter and its process was faced with a technologist at work who was responsible for creating a technology solution for the analyst but had no knowledge of the subject matter or its process.

In the emotion category at the individual level, *articulation of self* refers to differences in the realization that one's language, whether spoken or written, plays an important role in the analytic domain. For example, one analyst reported being able to think divergently before beginning to write an assessment, but once writing began, the thought process turned convergent. *Expectation of self* involves the individual's recognition that differences in one's assumptions, values, conclusions, etc. have an impact on one's own thinking and feelings. For example, an analyst professed, as an American, to support cultural assimilation, and could not understand how immigrants to America do not want to assimilate. *Integrity of self* encompasses the individual's recognition of the differences between right and wrong. For example, an analyst argued to pursue an analytic course of action against what that person thought was an appropriate problem, but others said that course of action could not be pursued.

In the emotion category at the social level, *bureaucracy* involves the individual's recognition of the different ways an organization's uniformity and control can influence one's feelings about oneself. For example, an analyst felt that revealing a unique methodology in a detailed, transparent way to others at work would answer skeptical concerns, while also realizing this would expose a vulnerability that could lead to the analyst being discredited in a production system that valued standard product lines. *Communicate with others* refers to differences surrounding the communication of analysis or an analytic product with others, and the pressures imposed on the analyst by the social environment. For example, an analyst felt pressure from work colleagues to deliver a product by a certain time, while feeling at the same time that it was more important to spend whatever time was needed to work on the novel problem. More examples of internalized tensions and other elements of the emergence phase, as described by the interviewed analysts, are available from the author upon request.

Priming

Every analyst interviewed reflected on past experiences unrelated to the novel problem they subsequently faced, and how these past experiences impacted their progress toward insight. The analysts recounted, on average, two or three priming sources from their past that helped them reach insight on their novel problems, leading to the identification in this study of five priming sources: past education experience, past family experience, period of residence in a foreign country, past mentor or leader discussion, and past work experience. From these sources, the analysts identified seven concepts—or primings—that they felt guided their thinking. Like the internalized tensions discussed above, these priming concepts can be organized within the cognition and emotion dimensions, then subdivided within the individual and social dimensions.

The analysts experienced five types of cognitively related primings—attending to causality, dealing with ambiguity, importance of details, problem strategies, and experiences with mission factors—of which the first four occurred at the individual level and the last occurred at the social level. They also identified two types of emotionally related primings—having multiple perspectives and awareness of cultural difference—of which the first occurred at the individual level and the second at the social level. Table 9 briefly describes the seven priming concepts and summarizes the analysts' experience by linking each concept to one or more of the five priming sources with triple XXXs. The concepts are discussed in more detail below.

Table 9: Priming Concepts and Their Sources Within Each Dimension

Priming								
Dimension	Dimension	Concept/ Source	Description	Past Education Experience	Past Family Experience	Period of Residence in Foreign Country	Past Mentor or Leader Discussion	Past Work Experience
Cognition		Attending to Causality	Experience of inquiring, observing, and interpreting cause and effect relationships.	XXX			XXX	
		Dealing with Ambiguity	Realization that the human elements in the world, whether internal to an organization or not, are neither binary nor always clear.					XXX
	Individual	Importance of Details	Recognition that in order to understand what is happening, one must look into the foundational elements that drive or contribute to what one sees on the surface.	XXX				XXX
		Problem Strategies	Experience with the importance of having an approach and a methodology to solve a problem.	XXX				XXX
	Social	Experiences with Mission Factors	Knowledge about an organization's mission and levels of decisionmaking.					XXX
	Individual	Having Multiple Perspectives	Experience of openness, of being able to understand others' perspectives, as well as one's own thinking.	XXX	XXX	XXX	XXX	
Emotion	Social	Awareness of Cultural Differences	Recognition that multiple cultures may exist within any environment and common attributes may exist across such differences.			XXX		

In the cognition category at the individual level, *attending to causality* involves the individual's experience of inquiring about, observing, and interpreting cause and effect in cognitive relationships. For example, when in graduate school, an analyst had studied how environmental factors could trigger outcomes in non-environmental (e.g., social or political) situations. Another analyst, whose father taught the game of chess, learned as a teenager to always think of the opponent's next move. *Dealing with ambiguity* involves the individual's realization that the meaning or purpose of human behavior can be ambiguous because that behavior—whether within one's own organization (i.e., internal) or in the external environment—is neither binary (i.e., not black or white) nor always clear (i.e., uncertain and vague). For example, an analyst had learned from private sector experience that what is licit can also be used for illicit purposes, so one never really knows for sure what is legitimate. *Importance of details* refers to the individual's recognition that, to understand what is happening, one must look into the foundational elements that drive or contribute to what one sees on the surface. As an example, an analyst's past engineering education supplied the concepts and details to think about what it takes to build something. Another analyst's past work experience provided a deep understanding of the value of databases and how their details can help reduce uncertainty. *Problem strategies* involve the experience that analysts have gained with the importance of having a cognitive approach and a methodology to solve a problem. For example, a civilian analyst's past work experience in the military taught the analyst that the first idea that comes into one's mind may not be the best idea, so it behooves one to think and reflect on that original idea. Another analyst's past education in social science provided the flexibility to seek out their own sources and approach to solve problems, because there is no one methodology in social science.

In the cognition category at the social level, *experiences with mission factors* encompasses conceptual knowledge about an organization's mission and levels of decisionmaking. As an example, a civilian analyst who had served in the military understood the needs of decisionmakers, such as mission planners and operators, and the role they saw for intelligence.

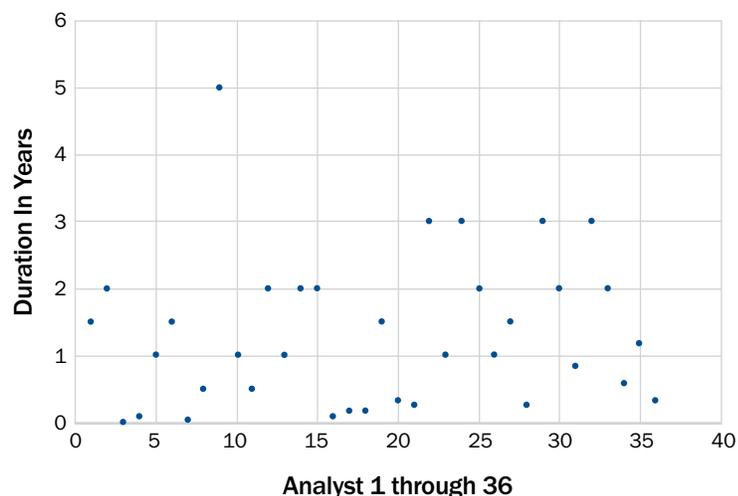
In the emotion category at the individual level, *having multiple perspectives* refers to the individual's experience of openness, which fuels the ability to understand others' perspectives in addition to one's own thinking and feeling. For example, analysts who have lived in foreign countries reported having gained an understanding of local cultural nuances, which gave them insight into how and why people in those countries behave the way they do. An analyst's graduate school education in anthropology taught the value of culture, language, and history in understanding a country and its people. An analyst listened to a senior general officer speak about "network" as broader than the analyst's limited perspective, which expanded the analyst's view of what is possible. An analyst's family experience of playing games, specifically action video games, included taking on different roles, and this game-playing engrained how and why people have different perspectives.

In the emotion category at the social level, *awareness of cultural differences* involves the recognition that multiple cultures may exist within one's environment and that people of other cultures can share common feelings, beliefs, norms, familial relationships, etc., amid their differences. As an example, an analyst who had lived in a foreign country realized that, even though the same language is spoken in several countries, the cultures in those countries can be very different.

Dwell Time

Dwell time refers to two timeframes for measuring analyst engagement with the problem at hand: duration and proportion. Duration marks the amount of time during which the analysts held the totality of their novel problems in mind, from problem initiation to solution. The duration of the analysts' insight stories averaged almost 16 months, with a standard deviation of about 10 months. There were two outliers: at a 24-hour and at a 5-year duration.

Figure 7. Duration in Years of Analyst's Insight Story



The vast majority of the insight experiences took between one to two years to complete. See Figure 7 for the duration distribution across the 36 analysts' insight stories.

The second measure is the proportion of time the analysts spent focused on their novel problems during the total duration of their insight stories. During their insight experiences, most analysts were occupied with other tasks and problems, which meant they could not devote full-time attention to their insight story problems. Although proportion data were not systematically collected during the study,

some analysts reported that, on certain occasions, they were able to spend all their work time on an aspect of their insight story. A few analysts stated that they thought about their insight story while away from work and occupied with tasks at home or during errands.

Insight

The “insight phase” comes with the realization that one has reached a unique understanding for the first time, and it is the terminus of the emergent phase. Every analyst reported multiple insights related to the novel problem tackled, with most describing a series of at least three insights in which the latter two built upon the first one. The analysts' descriptions can be organized into five types of insights: attending to details, seeing patterns, explaining complexity, personal assumptions, and organizational dynamics. Three are cognitively related insights—attending to details, seeing patterns, and explaining complexity—of which the first two occur at the individual level and the last occurs at the social level. The two remaining types are emotionally related insights—personal assumptions and organizational dynamics—of which the first occurs at the individual level and the second at the social level. Table 10 provides a brief description of these five insight types, organized within the cognition-emotion and individual-social dimensions.

The *attending to details* category of insight involves the individual's recognition, through a series of insights, that understanding a novel activity requires one to focus on the details of what is happening instead of

relying on the conclusions of others. For example, one analyst’s first insight was that focusing on the logistical trail of an adversary informed the analyst about how that adversary would fight. This led to the second insight that framing the problem in a work breakdown structure provided a comprehensive approach for investigating the logistical trail, followed by the third insight of how data supported the analyst’s understanding of the actual logistical trail.

Table 10: Types of Insight Within Each Dimension

Dimension	Dimension	Type	Description
Cognition	Individual	Attending to Details	Recognition that understanding novel activity requires a focus on the details of what is happening.
		Seeing Patterns	Realization that it is hard to recognize a new pattern, especially when others do not recognize that pattern as visible or correct.
	Social	Explaining Complexity	Explaining developments and making causal linkages for the consumption of consumers.
Emotion	Individual	Personal Assumptions	Taking the perspective of others to understand how others think and why one’s own perspective is similar or different.
	Social	Organizational Dynamics	Becoming aware of the organizational politics and agendas of an organization, which may make “speaking truth to power” difficult.

The *seeing patterns* category of insight refers to the realization that it can be hard to recognize a new pattern between activities or events exists, especially when others do not acknowledge that pattern as visible or correct. For example, an analyst’s first insight was that paying attention to new information created the sense that something different was happening. This fueled the recognition that anomalies meant a new pattern may be emerging (second insight), then the realization that seeing patterns gave the analyst confidence in this judgment (third insight). Both attending to details and seeing patterns are cognitive and experienced at the individual level.

The *explaining complexity* category of insight encompasses explaining developments and making causal linkages for the consumption of intelligence consumers. For example, an analyst’s first insight was that visually correlating disparate activities was a helpful way to frame and understand the larger picture. From this came the second insight that attention was not being paid to the treaties established between countries due to a focus on military threats, and the third insight that small things—such as a treaty, according to the analyst—can have a large, strategic impact. Explaining complexity is cognitive and experienced at the social level.

The *personal assumptions* category of insight involves adopting others’ perspectives in order to understand what others think and why one’s own perspective is similar or different. For example, an analyst recognized the great importance of identity in understanding the people of a foreign country (first insight), followed

by the realization that Americans might not understand the logic behind the decisions made by people from a foreign country, leading to American frustration (second insight). The analyst concluded that understanding a foreign country's culture and history was critical to understanding its people's behavior (third insight). Personal assumptions are largely emotional and experienced at the individual level.

The *organizational dynamics* category of insight refers to becoming aware of the organizational politics and agendas of the analyst's organization, which may make "speaking truth to power"—or sharing unwelcome assessments with those more senior—difficult. For example, by using proxy—or indirect—information, one analyst determined developments about an adversarial group (first insight). However, the analyst's leadership was quick to dismiss the analyst's methodology and intelligence assessment (second insight), leading to pressures imposed by the analyst's organization that impaired the analytic process (third insight). Organizational dynamics are largely emotional and experienced at the social level. More examples of the five categories of insight, as described by the interviewed analysts, are available from the author upon request.

After Insight

The "after insight" phase, which follows the analyst's insights, includes resistance and mitigation, and solution. Not all analysts experienced resistance to their insights, but most did. The reasons for resistance can be grouped into four categories: experts do not agree, leadership concerns, organizational politics, and too much work required. All analysts arrived at solutions or made progress toward a solution to the problem they initially addressed. Four categories of solutions reached by the analysts can be discerned: conceptual, event-related, international politics, and weapons-related.

Resistance and Mitigation

Some analysts experienced resistance to their insights because other analysts, who were considered experts on the topic, did not believe the analysts' insights; the experts were loath to change their assessments of the problem. For example, in one analyst's encounter, the experts were firm that nothing was changing when faced with the analyst's insight that a new trend was emerging. The analyst mitigated this resistance by providing details that justified the trend-change insight. See Table 11 for brief descriptions of the four reasons for resistance experienced by the analysts in this study.

Other analysts experienced resistance from leadership concerns about the organizational mission, responsibility, and reputation, which were expressed directly to the analyst. For example, leadership in an organization that expected high-confidence assessments judged one analyst's insight-based assessment to have too low a confidence level to be accepted. The analyst mitigated leadership resistance by explaining the fairly unique methodology used in a readily understandable way.

A third reason for resistance to analyst insight was organizational politics and agendas due to either vertical hierarchical tensions or horizontal competition, which were acknowledged by many members of the

organization as a norm. For example, one analyst focused on a problem and experienced insights only to be confronted by analysts from another part of the organization claiming the analyst’s division did not have responsibility for the issue. The analyst mitigated this resistance by seeking the support of leadership who defended the analyst’s details and logical approach to the other division’s leadership.

Table 11: Reasons for Resistance

Reasons for Resistance	Description
Experts do not agree	Other analysts who are considered experts about a topic do not believe an analyst’s insight because these experts firmly believe their assessment remains true.
Leadership concerns	A leader’s concerns about the organizational mission, responsibility, and reputation are expressed directly by the leader to the analyst.
Organizational politics	The organizational politics and agendas due to either vertical hierarchical tensions or horizontal competition, acknowledged by many members of the organization as a norm.
Too much work required	Reaction by others that the insight’s consequences would create too much work for them.

A fourth source of resistance to analyst insight came from other analysts or managers who thought that the consequences of the analyst’s insight would create too much work for them. For example, insight led an analyst to propose a different problem-solving model that would require software and hardware development, as well as an increase in staffing of skilled professionals. The analyst mitigated resistance to investing in the new model by seeking outside support from other IC agencies. In this case, even though the analyst wrote proposals for the other agencies, the model was not fully funded. More examples of the four categories of resistance and respective mitigation efforts, as described by the analysts interviewed for this study, are available from the author upon request.

Solution

As noted above, the insights reached by the interviewed analysts fueled four types of solutions: conceptual, event-related, international politics, and weapons-related. Examples of conceptual solutions include using fiction for imagining the future and producing a guidebook to help team members understand a difficult concept. Event-related solutions include assessments that particular events would or would not occur or that the significance of these events was high or low. Countries establishing new or deeper relationships provide an example of the international politics type of solution. Examples of weapons-related solutions include locating weapons or developing fresh approaches to locate weapons. More examples of the four categories of solutions, as shared by the analysts, are available from the author upon request.

Sustained Benefit

During the study interviews, the analysts discussed the benefits they still enjoyed from their past insight experiences, reflecting on how today they viewed their experiences from an emotional and cognitive perspective, and from an individual and social perspective. Emotional benefits refer to the long-term effects of the insight experience on individual emotional maturity and on one's development operating in a social environment. Cognitive benefits, on the other hand, are the long-term effects of the insight experience on one's intellectual capacity and on one's contributions to others within the organization.

Many of these benefits have been life- or career-long, and almost all reflect insight experiences that occurred years before this study. Collectively, the analysts described seven emotional benefits that can be divided between the individual level—i.e., challenge myself, confidence in myself, effect of emotion, integrity, openness, and personal satisfaction—and the social level—i.e., dialogue triggers my thinking. The seven cognitive benefits described by the analysts can also be divided between the individual level—i.e., career effect, new realizations, and a systems approach—and the social level—i.e., asking big questions, knowledge of constraints, customer relations, and ideas: knowing where they originate. Table 12 briefly describes these beneficial impacts, organized within the emotion-cognition and individual-social dimensions, with examples provided further below.

Emotion

At the individual level, analysts reflected in the interviews on how their insight experience has benefited their personal development as intelligence analysts. The *challenge myself* benefit reflects personal growth in no longer being afraid to question or confront oneself or others. For example, an analyst has grown better able to challenge others without fear of retribution for thinking differently about a topic. The *confidence in myself* benefit captures how the insight experience has given the analyst a certain power over their circumstances. As an example, an analyst has grown more self-assured through resolving issues. The *effect of emotion* benefit describes the recognition that emotion seeps into discourse, even when such discourse is expected to be based on reason. One analyst has realized that, in analytic debates, emotionally based attitudes can arise from personality traits or conflicts or from the perceived need to defend one's reputation.

The *integrity* benefit relates to upholding principles on which one acts and behaves, instead of operating from a transactional perspective. From the insight experience, an analyst has learned that one must stand up for one's judgments even when confirmation of one's position does not come until years later. The *openness* benefit reflects the mental flexibility derived from diverse experiences, fostering the ability to hold multiple views while considering the value of each view. For example, one analyst embodied this benefit through experience in the military, government, and private sector. This diversity of experience has granted the analyst different lenses through which to understand how people can frame issues in multiple ways. The *personal satisfaction* benefit addresses the analyst's belief that one's insight experience has been a major contributing factor to having a fulfilling professional life as an analyst. One analyst described the insight experience as providing an understanding at a deep and emotional level of the significance of one's work.

Table 12: Sustained Benefits from Insight Experience

Sustained Benefit from Insight Experience			
Dimension	Dimension	Specific Impact	Description
Emotion	Individual	Challenge myself	Not being afraid to question and/or confront oneself or others.
		Confidence in myself	The insight experience has given one a certain power over one's circumstances.
		Effects of emotion	Recognition that emotion seeps into discourse, even when such discourse is expected to be based on reason.
		Integrity	Upholding principles on which one's self and others can act and behave, instead of operating from a transactional perspective.
		Openness	Mental flexibility derived from a diversity of experience and the ability to hold multiple views and consider the value of each.
		Personal satisfaction	Belief that one's insight experience gives one an understanding at a deep and emotional level about the significance of what one does.
	Social	Dialogue triggers my thinking	When in conversation with others, listening to others can cause one's own thinking to evolve.
Cognition	Individual	Career effect	Realization that the insight experience has had a direct causal influence on the trajectory of one's career.
		New realizations	Recognition of activities, values, or behaviors that have become fully or vividly internalized in oneself, whereas prior to the insight experience, they were only abstract notions.
		Systems approach	The consideration of as many factors as possible—including space and time, as well as causes and effects—when trying to understand a situation. Synonyms for this benefit are full spectrum approach, work breakdown structure approach, and new assessment approach.
	Social	Asking big questions	How a specific question on one's mind can be transformed and asked so that it has value and meaning for everyone in a given environment.
		Knowledge of constraints	A positive factor through the realization that, although individuals, groups, or an organization can constrain one's ability to explain a complex situation in understandable terms, having an outsider explain the situation can help.
		Customer relations	Experience of interacting with customers outside of the intelligence-producing domain, including policymakers, operational commanders, and planners.
		Ideas: Knowing where they originate	One's expanded awareness that external factors may facilitate or thwart new ideas, and that one's self is not the only source of new ideas.

At the social level, the *dialogue triggers my thinking* benefit involves the awareness that listening to others, when in conversation with them, can cause one's own thinking to evolve. For example, an analyst reported that listening to other perspectives has helped to make new connections in the analyst's mind.

Cognition

At the individual level, the *career effect* benefit is the analyst's realization that the insight experience has had a direct causal influence on the trajectory of the analyst's career. For example, an analyst reflected that a 10-year-old insight experience has been the most impactful situation in the analyst's career. The *new realizations* benefit involves the recognition of activities, values, or behaviors that have become fully or vividly internalized in oneself, whereas prior to the insight experience, they were abstract notions. For example, an analyst has come to a deep understanding that intelligence and national security efforts are the price of freedom, even when these efforts have horrible personal consequences. The analysts described the *systems approach* benefit in a number of ways, including such synonyms as full spectrum approach, work breakdown structure approach, and net assessment approach. The analysts consistently cited the need to consider as many factors as possible—such as time and space, as well as causes and effects—when trying to understand a situation. An analyst, who had more or less taken available information at face value prior to the insight experience, has adopted the practice of looking to see what else is going on beyond the obvious.

At the social level, the *asking big questions* benefit refers to how a specific question on an analyst's mind can be reframed by the analyst so that it has value and meaning for everyone within the analyst's organization. As an example, an analyst who typically reports on the locations of military units has introduced broader questions about why and how these military units are behaving as detected. The *knowledge of constraints* benefit may initially appear to be negative, but the analysts reflected upon it as a positive gain from their insight experience. One analyst, for example, came to realize that the group had constrained its own ability to explain a complex situation in terms that anyone could understand; however, if someone from outside the group was introduced to the situation, that person could help explain it. The *customer relations* benefit involves the experience of interacting with customers outside of the intelligence-producing domain, e.g., policymakers, operational commanders, and planners. For example, one interviewee had thought of an analyst as analogous to a delivery person, but the insight experience has led this person to realize how much power analysts have even though hierarchically or by seniority, they formally do not. The *ideas: knowing where they come from* benefit encompasses the analyst's expanded awareness of factors that may facilitate or thwart new ideas, and that one's self is not the only source of new ideas. For an example of the former, one analyst experienced insight arising from the ability to reduce and, in some circumstances, eliminate ambiguities in the environment and subject matter. The analyst has realized that only through clarity can insight be achieved. More examples of the 14 types of emotional and cognitive benefits as a result of the analysts' insight experiences are available from the author upon request.

Conclusion and Implications

The results of this study of 36 intelligence analysts, recognized by their supervisors as having achieved insight at some point in their careers, illustrate the commonalities and differences of their insight experiences—both with one another and with the insight standards outlined in the Literature Review. This section will briefly compare the IC analysts’ insight journeys, drawing on the phases shown earlier in Figure 6, with the literature’s concepts and models. Although there are similarities between this study and the literature’s key information processing theories of insight and creativity, shown in Figures 1 and 2, there are major differences. This section will close with the implications of this study for fostering insight in the Intelligence Community.

Insight Antecedents: Triggering Factors

Unpredictability

Interestingly, the insight stories of the 36 intelligence analysts interviewed for this study showed a distinction from the literature’s description of the phases of insight at the very start of the process. Although unpredictability has been discussed in the creativity literature as part of the actual insight or discovery, unpredictability instead occurred during the opening phase of problem initiation in the IC analyst study and sheds light on the notorious difficulty of predicting insight.¹⁹⁹ For example, Ohlsson describes the difficulties in predicting insight as linked to not knowing one or more of the following: the experience or knowledge already available to the individual; the nature of the individual’s cognitive processes; what sort of rules the individual has used to interpret and understand aspects about the situation under consideration, i.e., problem representation; what is in the individual’s long-term memory and the pathways that connect such memories to consciousness; what strategy the individual is using when initially encountering the problem; what mental or affective capabilities the individual has for changing the problem representation; and the individual’s ability to extrapolate from the insight into the future, where the final solution is realized.²⁰⁰ This list of gaps does not include unpredictability during the problem initiation phase.

To some degree, however, being able to take advantage of unpredictability is consistent with the writings of Csikszentmihalyi and Sawyer and with Sadler-Smith’s expansion of Wallas on “preparation” within the creative process.²⁰¹ If one interprets preparation more broadly than subject matter expertise, then one can extend the phenomenon of preparation to include being open to taking advantage of unpredictability and chance, as the IC analysts were during the insight trigger phase of their insight journeys.

Problem Finding

Looking at the problems that triggered the IC analysts' insight journeys, their complex, novel problems put their journeys closer to those of the eminent scientists featured in many of the literature accounts than might have been anticipated. As earlier recounted, Csikszentmihalyi and Sawyer describe their theory of creativity—which includes insight—through two problem strategy paths.²⁰² The “presented problem-solving process,” where the problem is well-known and the solution can be easily and quickly found, is more common with everyday sort of problems. The “discovered problem-finding process,” where the problem itself is ambiguous and not well framed, is more common with revolutionary scientific achievements. The novel problems encountered in this study were not easy and did not fall into the category of a presented problem-solving type; all the analysts used the more complex discovered problem-finding process.

Both theories of creativity offered by Csikszentmihalyi and Sawyer and by Wallas, as reinterpreted by Sadler-Smith, have been based on modeling the behavior of individuals that produced revolutionary insights like Charles Darwin's theory of evolution or, in modern day analogies, Nobel Prize and Pulitzer Prize winners.²⁰³ Intelligence analysts do not fit into that category, however, because intelligence analysis is not a career field with the full-time professional expectation of producing creative outcomes. Nonetheless, intelligence analysts periodically engage in creative activity and, therefore, fall into Kaufman and Beghetto's “little creativity” category of individuals—not in an everyday creative profession, but periodically engaging creatively by demonstrating inquisitiveness, imagination, and freedom of thought.²⁰⁴ This study, therefore, provides an understanding of how people—not in the full-time creativity business—are insightful and creative because they are motivated by confronting high-stake risks to national security.

Problem Type

Because the IC analysts in this study adopted a problem-finding process for novel problems, they were focused on problems for which uncertainty prevailed and there were no single or easy answers, i.e., the problems of predicting the future and of explaining mysteries in the present. Although uncertainty cannot be eliminated when predicting the future, it may be reduced when solving mysteries about the present if more information becomes available to explain the present developments. As suggested by Csikszentmihalyi and Sawyer and by Wallas, as reinterpreted by Sadler-Smith, one of the factors that contributes to the persistence of uncertainty is the volume of information collected and used for intelligence purposes.²⁰⁵ No one can know everything, no one can know when the facts needed will be known, and no one can predict how or when to separate the “nuggets” from the chaff.²⁰⁶ In other words, novel problems invite multiple answers. Competition of ideas and solutions is a natural consequence when facing novelty.

Not only are the analysts who tackle novel problems also facing inherently the most challenging types of problems dealing with uncertainty—predictions and mysteries—these same analysts are the most in need of achieving insight. Certainly, policymakers have argued this, in part, in their calls for analytic insight.

As discussed at the beginning of this monograph, the need for insight makes it incumbent upon the IC to learn how to enable the insight process—arguably through the cognition-emotion mechanism first described by Damasio.²⁰⁷

Conflicting Representations

The intelligence analysts in this study experienced a more nuanced plurality of encounters with inconsistencies—i.e., the differing representations of a problem that can trigger movement toward insight—than as outlined in the Literature Review. In both Ohlsson's and Klein's theories of insight, as earlier discussed, contradictions or cognitive conflict figure prominently in the triggering event that propels one toward insight.²⁰⁸ Ohlsson equates cognitive conflict with Festinger's cognitive dissonance, the individual experience of internal inconsistency that serves as a motivator to resolve that inconsistency.²⁰⁹ Klein also refers to contradictions as inconsistencies an individual initially faces that serve as one of three triggers toward resolving, or gaining insight about, the problem.²¹⁰

The IC analysts first encountered inconsistency in a direct and active fashion, experiencing first-hand the inconsistency between their view and others' views. After the analysts represented their novel problems and proposed ways to approach the problems to others in their social environment, these others responded with different representations of the novel problems, showing they were typically not experiencing these problems in the same fresh way as the analysts. For the analyst, this first interaction was the motivational trigger to move forward toward insight, in the spirit of Ohlsson's and Klein's theories.

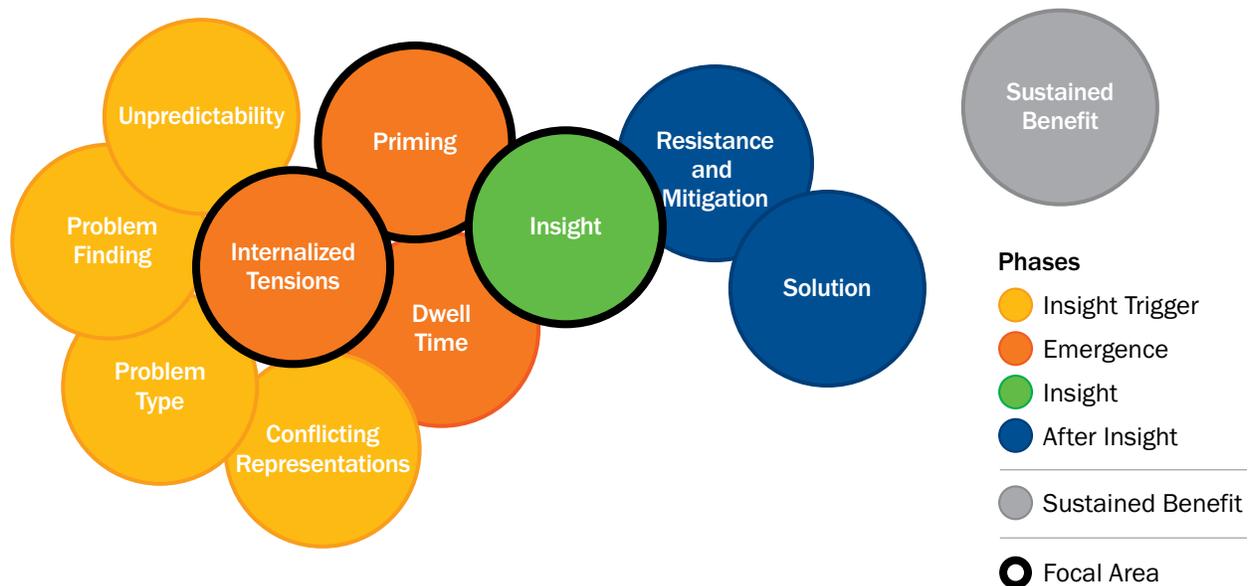
The analysts' second set of inconsistency encounters went beyond Ohlsson and Klein, however, as these encounters came after problem representation and can be categorized as indirect, passive, perceptual, and individual experiences. Rather than serving as triggers in the general sense of Ohlsson and Klein,²¹¹ these inconsistencies—called internalized tensions in this monograph's Findings—initiated the emergence stage of insight. Unlike the motivating triggers of cognitive conflict or contradiction mentioned by Ohlsson and Klein, which focus on the specific problem being addressed by the individual, internalized tensions represent a diverse set of perceptions located within the individual that extends beyond the initial conflicting representations of others. Internalized tensions may also be peripheral to the actual problem that one is attempting to solve and to one's environment.

Insight Emergence: The Insight Journey

The insight journey is a process that, once triggered, begins with the emergent factors of internalized tensions and priming, and then transitions into insight. This study of 36 intelligence analysts who have experienced insight illustrates the relationship between the proximal antecedents of internalized tensions and priming and the insight itself. Figure 8 identifies these three phenomena within the creativity framework earlier derived from analysis of the insight process shared by the 36 analysts interviewed (see Figure 6. IC Analysts' Insight Process). The study also suggests a set of archetypes of insight outcomes, which can serve

as pathways for IC analysts to follow in their quest for insight and for managers of IC analysts to foster, and which are discussed below and shown in Figure 9, Archetypes of Insight Outcomes.

Figure 8. Focal Areas Surrounding Insight



Connectedness Between Emergent Factors and Insight

As reported in the Findings, the analysts interviewed for this study were all aware of internalized tensions, or inconsistencies. The tensions with which they grappled have been classified into a typology of 11 tension categories and organized across the four intersections of the emotion-cognition and individual-social dimensions (see Table 8. Internalized Tension Types Within Each Dimension). Although the set of tension categories in this study’s typology is not comprehensive, it probably is representative of what IC analysts experience because these analysts share common work environments in national security intelligence organizations and common professional skills.

As noted above in the discussion of the conflicting representation trigger, the literature review revealed no mention of tensions beyond the initial trigger phase—probably because the literature conceptualizations were derived mainly from analyzing either individuals in “big creativity” professions or critical incidents.²¹² In the big creativity professions, creative individuals (e.g., Nobel Prize winners) are recognized as the source of novelty because they demonstrate unique expertise in a specific subject matter and their expertise provides the foundation for exploring creative solutions. In critical incidents, the activity is not normal (i.e., extreme), and the response to the incident is sensemaking (i.e., a backward-looking understanding of what has happened). Intelligence analysts, however, are not full-time creative professionals; their insight stories reveal their lack of expertise at the start of their journeys to solve a novel problem; and their approaches to novel problems are forward-looking.

Priming, or past experience that is unrelated to the novel problem yet impacts the individual's progress in the present toward insight, both corresponds to and moves beyond the literature reviewed. Unlike the other emergent factor of internalized tensions, priming is unique to the individual and so is not a collective experience; nonetheless, this study's findings suggest that priming is responsive to internalized tensions. For example, one of the analysts interviewed recounted his experience of internalized tension as the expectation—called “expectation of self”—that men do not cry in patriarchal-based societies; however, both he and men in another society cried during a particular somber event. The analyst's priming drew on his past education and family experiences that led him to understand that similarities can occur among differences—called “multiple perspectives”—which is a mark of openness. This priming effect on internalized tensions led the analyst to see that the reverse relationship—differences can occur among similarities—also held. He ultimately arrived at a profound personal insight that transformed his interpretation of the battlefield: good people can do bad things if their needs are not met. This insight had an immediate positive effect by improving his understanding of complex behaviors in a foreign land, which deepened his analysis and value to operational decisionmakers in the field.

This interaction between internalized tensions and priming is consistent with Bargh and Chartrand's research, as well as work by U.S. cognitive psychologist John Mace, which shows that memories from one's past can mediate the present.²¹³ The connectedness of priming and internalized tensions as emergent factors is also consistent with Damasio's and Frijda's research that emotionally meaningful memories guide an individual's decision in the present;²¹⁴ with Wallas's and Sadler-Smith's research on the intimations phenomenon, which is the mechanism that connects emotions with cognition;²¹⁵ and with Minas et al.'s empirical results that priming supports insight and creativity.²¹⁶

This study expands beyond the literature by contributing analysis of the role priming plays as an emergent factor in insight for everyday workers. Priming has previously been researched as a demand signal in the individual's past that has an effect on that individual's future, but the findings of this study suggest that the opposite can occur—that is, the demand signal *causes* an individual *in the present* to search for a past priming experience in that individual's memory. Having a stockpile of diverse experiences and knowledge from which to draw memories, as intelligence analysts and others not in full-time creative positions generally have, facilitates a robust priming capacity that can be exploited when the unpredictable need arises in the present to solve a novel problem.

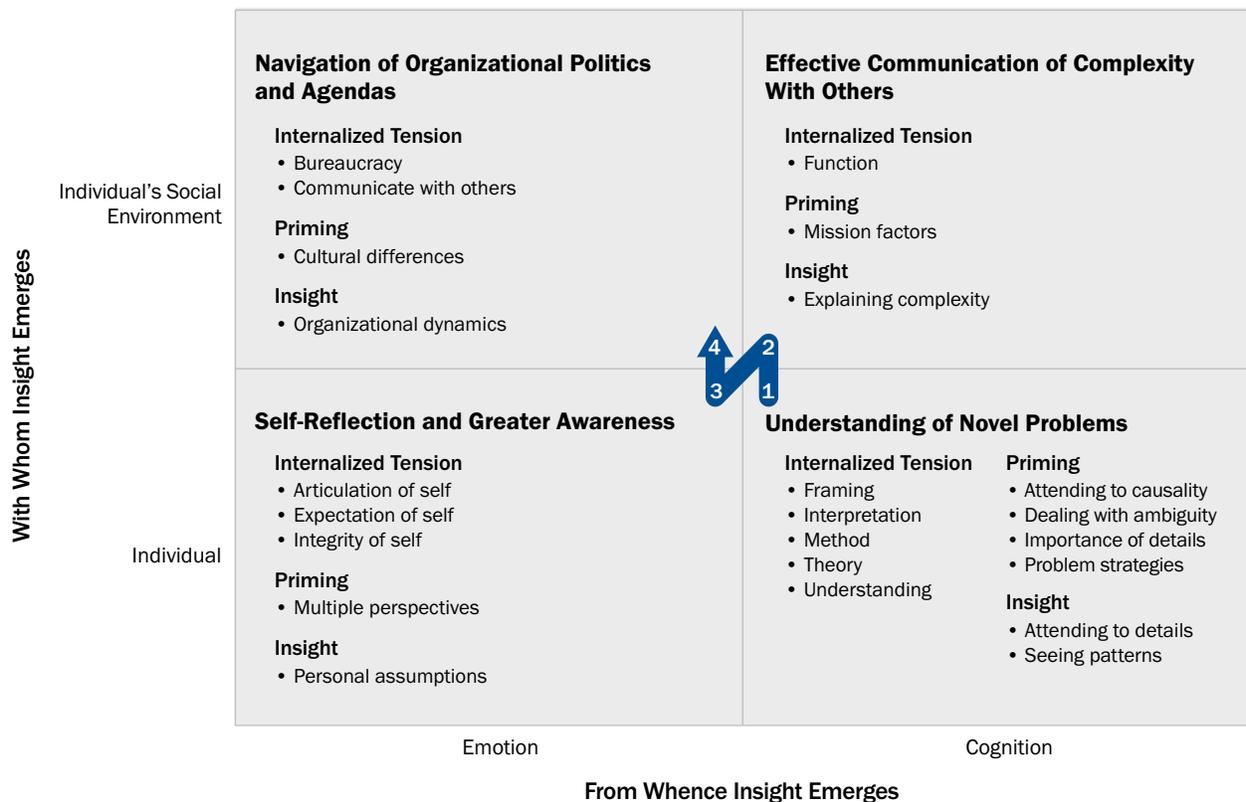
Regarding the manifestation of insight from the emergent factors of internalized tensions and priming, the study findings again both supported and expanded upon the literature. The IC analysts' reported experience of multiple insights, building upon previous insights, demonstrates Ohlsson's idea that individuals move through partial insights into a final insight.²¹⁷ The implications in practice are extremely important if the IC is to facilitate insightful analysis, as an initial “insight” should be considered only the first of more to come. Do not assume the analyst is finished after solving a problem with a first insight.

The study findings also indicate that insights span across all four intersections of the emotion-cognition and individual-social dimensions. More importantly, whereas the literature describes the “insight” stage as an individual phenomenon only,²¹⁸ this study reveals that insight can occur as both an individual and a social phenomenon.

Archetypes of Insight Outcomes

The study's findings on the interconnectedness of internalized tensions, priming, and insight suggest a set of four unique archetypes of insight outcomes when solving novel problems, shown in Figure 9, which can serve as pathways for IC analysts to follow in their quest for insight. The four archetypes, discussed in greater detail below, are understanding of novel problems, effective communication of complexity with others, self-reflection and greater awareness, and navigation of organizational politics and agendas. Displayed within each archetype are discrete types of emergent factors (i.e., internalized tensions and priming) and their resultant insight(s), drawn from the IC analysts' insight stories. The archetypes are arrayed across the intersections of the emotion-cognition and individual-social dimensions, based on differing approaches to the problems and insight outcomes.

Figure 9. Archetypes of Insight Outcomes



In cell 1, the cognition-individual connection among internalized tensions, priming, and insight suggests an outcome in which the individual gains a deeper understanding of the novel problem at hand. The internalized tensions of *framing*, *interpretation*, *method*, *theory*, and *understanding* are cognitive ways in which the individual may have considered the problem. The priming types of *attending to causality*, *dealing with ambiguity*, *importance of details*, and *problem strategies* are concepts that the individual may have brought forward

from past experience and that appear to contribute to resolving tensions. The insight categories of *attending to details* and *seeing patterns* fit into the individual's conceptualization of solving the novel problem.

In cell 2, the cognition-social connection suggests an outcome in which the individual effectively communicates complex ideas with others in the individual's organization or external to the organization. The internalized tension of *function* is the individual's conceptualization of how mission-related tasks and organizational missions fit into solving the problem. The priming of *mission factors* from past experiences appears to provide knowledge about how organizations function. The insight category of *explaining complexity* fits into the individual's challenge of translating the novel problem's complexity to an audience that is not entrenched in the details as the individual is.

In cell 3, the emotion-individual connection suggests a type of insight outcome that has the character of self-reflection resulting in greater self-awareness. The tensions of *articulation of self*, *expectation of self*, and *integrity of self* are individual and affective-related experiences (i.e., feelings and emotions). The priming of *multiple perspectives* from a diversity of past experiences appears to give the individual self-awareness about one's relationship to others and also openness to considering other viewpoints. The insight of *personal assumptions* represents the individual's awareness of, and reflection on, one's assumptions about the novel problem.

In cell 4, the emotion-social connection suggests an outcome in which the individual is able to navigate politics and agendas across cultures, whether the culture is that of the individual's employing organization and related organizations, or the culture of people in the world whom the individual's organization studies from a mission perspective. The tensions of *bureaucracy* and *communicate with others* are the individual's affective-related experiences within the organizational space. The priming of *cultural differences* refers to the individual's past experiences of living in foreign countries, providing the individual with an understanding of the different ways in which other cultures operate. The insight of *organizational dynamics* represents the recognition gained on the politics and agendas that fuel the way organizations operate.

Dwell Time

As was the case with insight antecedents, or triggers, the time that the interviewed analysts spent focused on their novel problems differed from the literature's descriptions of dwell time. In theories of creativity by Csikszentmihalyi and Sawyer and by Wallas, as reinterpreted by Sadler-Smith, incubation is seen as an important emergent factor for insight. For "little creativity" professionals (e.g., intelligence analysts), however, incubation was not in evidence in this study. In general, experimental studies on incubation have produced ambiguous and inconsistent results.²¹⁹ An experiment on incubation conducted by Australian psychologist Sophie Ellwood and colleagues concluded that taking a break from work does not uniformly contribute to insight, and the contribution depends on what type of work is accomplished when taking a break from the topic problem.²²⁰ The most significant time-related discovery from the IC analysts' insight experiences was their overall duration, as shown earlier in Figure 7 (Duration in Years of Analyst's Insight Story). The long timelines over which the analysts worked on their novel problems suggest that analysts

using a problem-finding approach where high levels of uncertainty prevail—e.g., prediction and mysteries—cannot be expected to produce insightful solutions or observations in short timeframes of minutes, hours, or days, which is consistent with Isaksen and Akkermans’ findings.²²¹ This is especially true when multitasking on other problems competes for the analyst’s attention.

Insight Aftermath

Short-Term Effects

The shift from insight emergence, to insight, and to insight aftermath reflects the change from viewing insight as a process to insight becoming a product. Consistent with Csikszentmihalyi and Sawyer’s theory of creativity, the last step is the elaboration stage: the time when insight is formulated into a knowledge product that others hear or read. These products are usually narratives, presented in a discussion or briefing with visual effects, or in a written document.

Most of the analysts interviewed for this study experienced resistance to the insights in their knowledge products. As already discussed, most—though not all—challenges were resolved to the satisfaction of the analysts because they had, in effect, become experts on the topic they addressed during their dwell time spent paying attention to the problem. Analysts “knew their stuff” by the end of their insight journeys, and it was just a matter of defending their process leading up to their insight outcomes.

The insight aftermath is where customers (e.g., policymakers) join the process, by viewing the product and generating the need for insightful products. For the customers, insight products are the focal point, and that customer framing has focused the IC’s attention on the product.²²² Such attention to insight as an outcome is laudable, but—without understanding the process of insight, as well as the organizational climate that leads to insightful products—it is equivalent to paying attention to symptoms without understanding their source. Understanding the insight process within the IC environment is needed to enable an implementation strategy that will lead to more consistently delivered insightful products.

Long-Term Effects

The long-term effects of the analyst’s insight experience—the emotional and cognitive benefits mentioned in Table 12 (Sustained Benefits from Insight Experience)—provide further motivation for the IC to take a proactive stance for greater understanding of the insight process. From an emotional perspective, for example, the benefit of openness (i.e., an individual’s mental flexibility) cannot be understated. National security specialist Uri Bar-Joseph and social psychologist Arie Kruglanski have discussed open-mindedness as an important antecedent to the consideration of alternative interpretations or hypotheses.²²³ When analysts are not open-minded, intelligence failures can occur. In his lessons-learned study of intelligence failures from the Iranian Revolution and the Iraq weapons of mass destruction case, U.S. political scientist Robert Jervis has concluded that a lack of openness contributed to the following problems: inferences being taken for

granted; over- and under-emphasis on specific parts of evidence; new information that supported the existing viewpoint inadvertently reinforcing that viewpoint; and the challenge of understanding how inferences are based on assumptions that are difficult, if not impossible, to disprove.²²⁴

From a cognitive perspective, the benefits that the analysts gained from their insight experience went beyond themselves and extended to the organization. For example, their experiences with intelligence customers shifted the focus from the analyst and production to how the organization could best meet the needs of the customer.²²⁵ Learning this lesson typically can only be accomplished by experiencing the analyst-customer interaction; the concept is difficult to internalize if consumed only as a theory.

Implications

At least 12 implications can be drawn from this study on insight in individuals who are not in full-time creative professions—e.g., intelligence analysts—who often deal with novel problems. These implications provide a foundation on which to build future research into the insight process as experienced by IC analysts and to develop recommendations for the IC to adopt that would foster the pursuit of insight and the production of insightful analysis.

First, because of unpredictability at the beginning of the process, the resultant inability to predict if and when an individual will experience insight also raises the question of whether and to what degree an individual can be tasked with initiating the insight process, with the expectation of significant results. The study made it clear that analysts must be mentally prepared and emotionally brave to be able to exploit such unpredictable opportunities. If order and control are valued by an organization that also seeks insightful analysis, then leaders could create the time and space for the uncontrollable nature of insight to emerge because its initiation falls within the realm of unpredictability.²²⁶

Second, regarding the role of leadership in organizations where order and control are emphasized, asking or telling employees and first-line supervisors to change in order to create time and space for insight—without the leaders themselves changing—might fail to achieve the goal of becoming a creative organization.²²⁷ Leaders who interact with employees on a daily basis influence their perceptions, feelings, and performance,²²⁸ and the leadership role in enabling insightful work cannot be overstated. Leaders not only have direct influence over their organizational climate, they also have important indirect influences over management practices, policies and procedures, and mission and strategy—to name a few.²²⁹

Third, the problems faced were novel to the analysts, they were ambiguous, and their solutions were not known to the analysts or others. Rather than applying the problem-solving process—for well-known problems with easily found solutions—individuals who face a novel problem should adopt the problem-finding process. In addition, analysts should not be constrained by the existing literature's theoretical frameworks for creativity, which do not fit the process for individuals who are not in full-time creative professions. Most intelligence analysts, like most knowledge producers, jump from one problem to the next, and their ability to control their focus on a novel problem is often in the hands of others, whether through customer

demands or management priorities or both. This study has upended the idea that insight can only occur by prepared minds;²³⁰ in fact, as seen in Table 6 (Timing of Insight Stories in Analysts' Careers), many insight stories came early in an analyst's tenure when the analyst had the least amount of knowledge.

Fourth, the plethora of insight stories from experiences early in the analysts' careers or assignments suggests the importance of experiencing insight early—perhaps when one is more open—rather than hoping it occurs later. March observes a learning tension between doing things the organization does on a regular basis (i.e., its recognized capabilities) and doing new and different things, which he describes as the difference between exploiting what is known and exploring the unknown.²³¹ If analysts do not get an early taste of exploring the unknown, then as they advance in tenure, they will likely "...adjust to an organizational code before the code can learn from them."²³² In other words, without the early experience of insight while still a new organizational member, analysts may become less likely to take risks as they enter the unknown, reducing the likelihood of being insightful as they mature in tenure.

Fifth, as a result, insight is not just nice to have or needed because policy says so. Insight is a fundamental and critical success factor for the IC writ large. Incorporating insight and creativity into the analytic process is not optional. This study of 36 IC analysts' insight experiences strongly suggests that framing and solving novel problems of prediction and mystery types requires insight. One can argue these are the most important types of problems that intelligence analysts and agencies should solve.²³³ The need for insight makes it even more imperative to understand how insight emerges and from whence it emerges, as suggested by this study.

Sixth, the study shows resistance to be a common phenomenon in the IC environment. Conflicting representations are the cognitive differences espoused by others when analysts offer their views on novel problems. These cognitive conflicts—whether antecedent or consequent—are good for the analyst and the organization to debate because they are an organic source of opportunity and learning about novel problems. While intellectual debate may rattle organizational politics and agendas, it behooves managers and analysts alike to resist avoiding or squashing them and to recognize the important role of dialogue, trust, and psychological safety.²³⁴

Seventh, the three phenomena of internalized tensions, priming, and insight (see Figure 8. Focal Areas Surrounding Insight) are experienced and connected through time—albeit in a nonlinear fashion—and are indicative of the phenomenon of temporal complexity.²³⁵ The internalized tensions experienced in the present draw upon primed feelings and concepts from the past, which then contribute to insight in the analyst's immediate future (as part of the effort to solve a novel problem). This connection across time is manifested organically within the individual. Hopefully, this internal connection can provide a useful scaffold on which analysts can frame their understanding of novel problems they are trying to solve. The idea that the present is linked with the past, which then guides one's approach into the future, does not suggest, however, that the future is predetermined. Rather, analysts should appreciate the following: the present does not stand alone as its path has been shaped by the past; history does not stand alone as it shapes the present; and the future does not mysteriously appear out of nowhere, setting aside the existence of unpredictable or random factors in any specific present.

Eighth, as noted in the Literature Review, various scholars have recommended that individuals, leadership, and organizations need a creativity climate to foster creativity and, by implication, to be insightful. This

study's findings point to powerful emotional and cognitive benefits achieved as a consequence of pursuing insight. The question for future research is how can a community or organization design an approach to enable insight and creativity that achieves the kinds of powerful benefits revealed in this study?

Ninth, many public and private academic institutions provide undergraduate and graduate education programs in intelligence analysis, and their graduates seek employment as analysts in intelligence agencies. Some of these programs have a formal academic linkage with the IC's National Intelligence University through the Intelligence Community Centers for Academic Excellence (IC CAE). Familiarizing faculty members from these IC CAE programs, as well as non-members, on the process of insight as it relates to intelligence analysis might help these faculty identify students whom they would recommend for recruitment into intelligence agencies.

Tenth, further regarding recruitment, the benefits of an insight experience, as outlined in Table 12 (Sustained Benefits from Insight Experience), provide a variety of possible indicators that recruiters could use to evaluate candidates for entry into the intelligence analysis field. Similarly, attributes that are associated with insight triggers such as problem-finding behaviors (see Table 7. Summary of Insight Trigger Factors)—including checking assumptions, understanding how things relate, how to overcome roadblocks, and proficiency with sensemaking—can provide additional indicators of a prospective candidate's potential to pursue successful insight journeys and make valuable contributions to the organization.

Eleventh, an individual or organization pursuing insight is not limited to the four archetypes of insight outcomes outlined in Figure 9. These archetypes not only may occur separately or combined within an individual tackling any one novel problem, but also can manifest in various ways across different individuals in separate or combined fashions. The latter suggests the potential for members of a team that is collectively focused on a novel problem to combine insights. Because each individual in a team may participate in the insight process and exhibit one or more insight outcome archetypes, managing team insight and team creativity will be a complex leadership task. For example, the leader of a team striving to solve a novel problem would be wise to select team members who contribute different perspectives.²³⁶

Last, the IC needs to shift its policy orientation to achieving insight outcomes. Not only will the internal intelligence analytical process suffer until it does, but also there is the danger that a persistent lack of understanding of the insight process will only foster uncertainty in customers.²³⁷ The irony is that, while one of the main functions of intelligence is to reduce uncertainty,²³⁸ the lack of understanding of the insight process by the IC actually increases uncertainty. The IC needs to improve its understanding of the insight and creativity processes, with the long-term goal of fostering a climate that enables such processes.

Limitations

Ideally, a study of individual insight experiences among those not working in full-time creative professions would include observations of real-life conditions in the field, but many challenges make that approach impractical for a time-constrained research project. Where such a field approach has been successful,²³⁹ the

focal point was a team or project, not an individual, and the insight effort studied was known in advance and focused on efforts generating creative solutions to novel problems. The work environment of intelligence analysts does not afford foreknowledge of when an individual insight journey will begin.

As a result, the author selected a retrospective approach based on interviews regarding past experiences with insight for this study. Keeping in mind that this method may have limitations such as memory recall and accuracy, the phenomenological approach used here meets the spirit of Wallas's and Sadler-Smith's recommendations to examine many individuals in order to gain deeper access into the process of insight and creativity. Admittedly, this study completed far fewer interviews than the hundreds Wallas recommended.²⁴⁰ The key difference, however, is that Wallas (1926) and his successors focused on the experiences of well-known and recognized insightful and creative thinkers. This study has focused instead on the everyday working person, whose insight experiences have not been well-studied.

With regard to the theorized incubation phenomenon, discussed in the Literature Review, most analysts interviewed did not have the luxury of thinking about the problem continuously throughout their insight story without the interruptions of other tasks, whether on-duty or off-duty. Moreover, data were not systematically collected on their off-duty thought patterns or on their experiences at work when tackling a different problem and then reengaging with the original problem.

As far as generalization, which is always a key question in qualitative studies, the findings should be generalizable to populations with similar analytic tasks. Even though the following populations have different contexts, they share equivalent analytic tasks and so this study could serve as motivation for future research on related analytic groups: law enforcement intelligence, military intelligence, and business competitive intelligence. Another area for future research would be to compare analysts having insightful experiences and analysts who are not successful because insight did not emerge. Such a study may provide additional factors on barriers to insight.

Conclusion

This study has asked the question: how does insight emerge when solving novel problems? The findings show that insight emerges within a creativity process consisting of four phases. The first phase is the triggering of the insight process, which includes the existence of unpredictability; the application of a problem-finding approach instead of the more simplistic problem-solving approach; a focus on prediction- and mystery-type novel problems; and the eventual intellectual disagreement of different representations of the novel problem. The second phase is the emergence of internalized tensions in the present, which are mediated by priming (i.e., past, and typically unrelated, experiences that have emotional and cognitive meaning and that help resolve the tensions). The third phase is the insight itself, usually accompanied by multiple follow-on insights. The fourth phase occurs after the insight when the solution is presented to others, resistance is usually experienced, and mitigation is attempted.

Insight leads to insightful outcomes, and this study identifies four archetypes of insight outcome resulting from the insight process. These archetypes are framed by the emotion-cognition and individual-social

dimensions, as shown in Figure 9 (Archetypes of Insight Outcomes). The four outcomes are an understanding of novel problems; effective communication of complexity with others, self-reflection and greater awareness, and navigation of organizational politics and agendas. Additionally, experiencing insight provides powerful long-term emotional and cognitive benefits.

This study uses a phenomenological methodology because little, if any, research has been conducted on everyday workers like intelligence analysts who, at times, must be creative because they face novel problems. These novel problems can have existential consequences. Because little is known about how this population engages in insight and creativity, and because decisionmakers expect this population to be insightful and creative, a focus on the phenomena of insight and creativity is appropriate. The study focuses on the individual level of analysis because intelligence analysis begins with the individual paying attention to a problem, and much of the information processing-related existing literature focuses on the individual.

This study clearly illustrates emergence as the connection between internalized tensions, priming, and insights, but it also raises questions about the mechanisms that causally connect these phenomena. Future research may investigate more deeply the relationship between internalized tensions in the present and priming experiences from the past, and how the priming experience serves as a mechanism to facilitate resolution of tensions and move the individual toward a new perspective on a novel problem. Additionally, the connection between emotion and cognition in solving novel problems—especially by everyday professionals not working in full-time creative work—is evident in this study, more so than in the existing literature. Future research may inquire into that connection.

Endnotes

1. Adrian Wolfberg, "Learning Through Dialogue During Intelligence Assessments: A Translation of Theory into Practice," *Engaged Management ReView* 4, no. 2 (2021): 15-24, <https://doi.org/10.28953/2375-8643.1068>.
2. Thomas H. Kean and Lee Hamilton, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States* (Washington, DC: U.S. Government Printing Office, 2004), 339, <https://www.9-11commission.gov/report/>; Laurence H. Silberman and Charles S. Robb, *The Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction* (Washington, DC: U.S. Government Printing Office, 2005), 560, <https://www.govinfo.gov/app/details/GPO-WMD>.
3. Mark M. Lowenthal, *The Future of Intelligence* (Medford, MA: Polity Press, 2018), 9.
4. Executive Order 12333: United States Intelligence Activities, as amended by Executive Order 13470, July 30, 2008, <https://www.archives.gov/federal-register/codification/executive-order/12333.html>.
5. Office of the Director of National Intelligence, *National Intelligence Strategy of the United States of America 2019*, January 2019, https://www.dni.gov/files/ODNI/documents/National_Intelligence_Strategy_2019.pdf.
6. Office of the Director of National Intelligence, *Intelligence Community Directive 203, Analytic Standards*, January 2, 2015, <https://www.dni.gov/files/documents/ICD/ICD%20203%20Analytic%20Standards.pdf>.
7. Office of the Director of National Intelligence, *Rating Scale for Evaluating Analytic Tradecraft Standards*, November 6, 2015.
8. Mihaly Csikszentmihalyi and Keith Sawyer, "Creative Insight: The Social Dimension of a Solitary Moment," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 329-63; Stellan Ohlsson, *Deep Learning: How the Mind Overrides Experience* (Cambridge, UK: Cambridge University Press, 2011), 54-62.
9. Csikszentmihalyi and Sawyer, "Creative Insight," 329-363; Dean K. Simonton, "Creativity: Cognitive, Personal, Developmental, and Social Aspects," *American Psychologist* 55, no. 1 (2000): 151-58, <https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.151>.
10. David T. Moore, *Critical Thinking and Intelligence Analysis* (Washington, DC: National Defense Intelligence College Press, 2007), 1.
11. Christina E. Shalley and Gamze Koseoglu, "Organizational Creativity," in *Encyclopedia of Creativity*, ed. Mark A. Runco and Steven R. Pritzker, 4th ed. (Cambridge, MA: Academic Press, 2020), 285-88.
12. Donald Norman, *Learning and Memory* (San Francisco, CA: W.H. Freeman and Company, 1982), 81-83; and Jean Piaget, *The Construction of Reality in the Child* (Abingdon, UK: Routledge and Kegan Paul, 1954), 350-57.
13. James K. Doyle and David N. Ford, "Mental Models Concepts Revisited: Some Clarifications and a Reply to Lane," *Systems Dynamics Review* 15, no. 4 (Winter 1999): 411-15, [https://doi.org/10.1002/\(SICI\)1099-1727\(199924\)15:4%3C411::AID-SDR181%3E3.0.CO;2-R](https://doi.org/10.1002/(SICI)1099-1727(199924)15:4%3C411::AID-SDR181%3E3.0.CO;2-R).
14. Peter H. Gray and Darren B. Meister, "Knowledge Sourcing Effectiveness," *Management Science* 50, no. 6 (2004): 821-32, <https://doi.org/10.1287/mnsc.1030.0192>.

15. Amy C. Edmondson and Bertrand Moingeon, "From Organizational Learning to the Learning Organization," *Management Learning* 29, no. 1 (1998): 5-20, <https://doi.org/10.1177%2F1350507698291001>.
16. Kevin N. Dunbar, "How Scientists Really Reason: Scientific Reasoning in Real-World Laboratories," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 365-95; Albert Rothenberg, *Flight from Wonder: An Investigation of Scientific Creativity* (Oxford, UK: Oxford University Press, 2015), 74; Dean K. Simonton, *Origins of Genius: Darwinian Perspectives on Creativity* (New York, NY: Oxford University Press, 1999), 27-40.
17. Peter A. Corning, "The Re-emergence of 'Emergence': A Venerable Concept in Search of a Theory," *Complexity* 7, no. 6 (2002): 23, <https://doi.org/10.1002/cplx.10043>.
18. Adrian Wolfberg, "The Challenges of Creating a New Analytical Culture," *American Intelligence Journal* 22, no. 1 (2004): 11-20.
19. Gary Klein and Andrea Jarosz, "A Naturalistic Study of Insight," *Journal of Cognitive Engineering and Decision Making* 5, no. 4 (2011): 335-51, <https://doi.org/10.1177%2F1555343411427013>.
20. Gregory Bateson et al., "Toward a Theory of Schizophrenia," *Behavioral Science* 1, no. 4 (1956): 253, <https://doi.org/10.1002/bs.3830010402>.
21. Bateson et al., "Toward a Theory of Schizophrenia."
22. Stephen Marrin, "Understanding and Improving Intelligence Analysis by Learning from Others," *Intelligence and National Security* 32, no. 5 (2017): 539-47, <https://doi.org/10.1080/02684527.2017.1310913>; Joseph Soeters, *Management and Military Studies: Classical and Current Foundations* (New York, NY: Routledge, 2020), 1-10.
23. Stephen Marrin, "Analytic Objectivity and Science: Evaluating the U.S. Intelligence Community's Approach to Applied Epistemology," *Intelligence and National Security* 35, no. 3 (2020): 350-66, <https://doi.org/10.1080/02684527.2019.1710806>.
24. Robert Jervis, *Why Intelligence Fails: Lessons from the Iranian Revolution and the Iraq War* (Ithaca, NY: Cornell University Press, 2010), 3; and Klein and Jarosz, "A Naturalistic Study of Insight," 335-51.
25. Andreas Fischer, Samuel Greiff, and Joachim Funke, "The Process of Solving Complex Problems," *Journal of Problem Solving* 4, no. 1 (2011): 19-42, <http://hdl.handle.net/10993/3184>; Scott G. Isaksen, "Unleashing Creative Talent in Organizations—Linking Learning and Creativity through Creative Problem-Solving," in *Creativity and Innovation in Organizations*, ed. Michael D. Mumford and E. Michelle Todd (New York, NY: Routledge, 2020), 345-98.
26. William Ocasio, "Towards an Attention-Based View of the Firm," *Strategic Management Journal* 18 (Summer Special Issue, 1997): 189, [https://doi.org/10.1002/\(SICI\)1097-0266\(199707\)18:1+%3C187::AID-SMJ936%3E3.0.CO;2-K](https://doi.org/10.1002/(SICI)1097-0266(199707)18:1+%3C187::AID-SMJ936%3E3.0.CO;2-K).
27. James G. March and Herbert A. Simon, *Organizations* (New York, NY: John Wiley and Sons, 1958), 137-72.
28. Ocasio, "Towards an Attention-Based View of the Firm," 187-206.
29. March and Simon, *Organizations*, 137-72; James G. Miller, "Information Input Overload and Psychopathology," *American Journal of Psychiatry* 116, no. 8 (1960): 695-704, <https://doi.org/10.1176/ajp.116.8.695>.
30. Adrian Wolfberg, "A Theory of Overload and Equivocality Effects on Learning during Knowledge Transfer within Policy Making Dyads" (Ph.D. dissertation, Case Western Reserve University, 2014), https://etd.ohiolink.edu/apexprod/rws_etd/send_file/send?accession=case1393843187&disposition=attachment.
31. Robert J. Sternberg, "A Three-Facet Model of Creativity," in *The Nature of Creativity*, ed. Robert J. Sternberg (Cambridge, UK: Cambridge University Press, 1988), 125-47.
32. Jacob W. Getzels and Mihalyi Csikszentmihalyi, "From Problem Solving to Problem Finding," in *Perspectives in Creativity*, ed. Irving A. Taylor and Jacob W. Getzels (Chicago, IL: Aldine, 1975), 90-115.
33. Antonio Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York, NY: Penguin Books, 1994), 128-30.

34. Rothenberg, *Flight from Wonder*, 60-71.
35. Stellan Ohlsson, "The Dialectic between Routine and Creative Cognition," in *Insight: On the Origins of New Ideas*, ed. Frederic Vellee-Tourangeau (New York, NY: Routledge, 2018), 8-29.
36. Daniel J. McAllister, "Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations," *Academy of Management Journal* 38, no. 1 (1995): 24-59, <https://doi.org/10.5465/256727>; and Rothenberg, *Flight from Wonder*, 60-71.
37. Rothenberg, *Flight from Wonder*, 60-71.
38. Damasio, *Descartes' Error*, 128-30.
39. Damasio, *Descartes' Error*, 128-30.
40. Antoine Bechara, Hanna Damasio, and Antonio Damasio, "Emotion, Decision Making and the Orbitofrontal Cortex," *Cerebral Cortex* 10, no. 3 (2000): 295-307, <https://doi.org/10.1093/cercor/10.3.295>.
41. Damasio, *Descartes' Error*, 174.
42. Fischer, Greiff, and Funke, "The Process of Solving Complex Problems," 19-42.
43. Stellan Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," in *Advances in the Psychology of Thinking*, ed. Mark T. Keane and Kenneth J. Gilhooly (Hempstead, UK: Harvester Wheatsheaf, 1992), 1-44.
44. Daniel Kahneman, *Thinking, Fast and Slow* (New York, NY: Farrar, Straus and Giroux, 2011), 19-30; William Taggart and Daniel Robey, "Minds and Managers: On the Dual Nature of Human Information Processing and Management," *Academy of Management Review* 6, no. 2 (1981): 187-95, <https://doi.org/10.5465/amr.1981.4287774>; Michael L. Tushman and David A. Nadler, "Information Processing as an Integrating Concept in Organization Design," *Academy of Management Review* 3, no. 3 (1978): 613-24, <https://doi.org/10.5465/amr.1981.4287774>.
45. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Simonton, *Origins of Genius*, 27-40; Eugene Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process: More than Meets the Eye," *Creativity Research Journal* 27, no. 4 (2015): 342-52, <https://www.tandfonline.com/doi/abs/10.1080/10400419.2015.1087277>; Graham Wallas, *The Art of Thought* (London, UK: J. Cape, 1926), 79-107.
46. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
47. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
48. Jonathan Dalton, "What is Insight? The Five Principles of Insight Definition," *Thrive*, March 28, 2016, <https://thrivethinking.com/2016/03/28/what-is-insight-definition/>.
49. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44; Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
50. Ivan K. Ash, Patrick J. Cushen, and Jennifer Wiley, "Obstacles in Investigating the Role of Restructuring in Insightful Problem Solving," *Journal of Problem Solving* 2, no. 2 (2009): 6-41, [10.7771/1932-6246.1056](https://doi.org/10.7771/1932-6246.1056); Ivan K. Ash, Benjamin D. Jee, and Jennifer Wiley, "Investigating Insight as Sudden Learning," *Journal of Problem Solving* 4, no. 2 (2012): 1-27, [10.7771/1932-6246.1123](https://doi.org/10.7771/1932-6246.1123).
51. Ash, Jee, and Wiley, "Investigating Insight as Sudden Learning," 1-27.
52. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
53. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
54. Wlodzislaw Duch, "Intuition, Insight, Imagination, and Creativity," *IEEE Computational Intelligence Magazine* 2, no. 3 (2007): 40-52, <https://doi.org/10.1109/MCI.2007.385365>; Berys Gaut, "Creativity and Imagination," in *The Creation of Art*, ed. Berys Gaut and Paisley Livingston (Cambridge, UK: Cambridge University Press, 2003), 148-73; Dustin Stokes, "The Role of Imagination in Creativity," in *The Philosophy of Creativity: New Essays*, ed. Elliot S. Paul and Scott B. Kauffman (Oxford, UK: Oxford University Press, 2014), 157-84.
55. Stokes, "The Role of Imagination in Creativity," 157-84.

56. Dustin Stokes, "Imagination in Creativity," in *The Routledge Handbook of Philosophy of Imagination*, ed. Amy Kind (London, UK: Routledge, 2016), 247-61.
57. Erik Dane and Michael G. Pratt, "Exploring Intuition and its Role in Managerial Decision Making," *Academy of Management Review* 32, no. 1 (2007): 33-54, <https://doi.org/10.5465/amr.2007.23463682>; Julie Gore and Eugene Sadler-Smith, "Unpacking Intuition: A Process and Outcome Framework," *Review of General Psychology* 15, no. 4 (2011): 304-16, <https://doi.org/10.1037/a0025069>.
58. Gore and Sadler-Smith, "Unpacking Intuition," 304-16; Emma Policastro, "Creative Intuition: An Integrative Review," *Creativity Research Journal* 8, no. 2 (1995): 99-113, https://doi.org/10.1207/s15326934crj0802_1.
59. Dane and Pratt, "Exploring Intuition and its Role in Managerial Decision Making," 33-54.
60. John A. Bargh and Tanya L. Chartrand, "Studying the Mind in the Middle: A Practical Guide to Priming and Automaticity Research," in *Handbook of Research Methods in Social and Personality Psychology*, ed. Harry T. Reis and Charles M. Judd (New York, NY: Cambridge University Press, 2000), 253-85.
61. Endel Tulving and Daniel L. Schacter, "Priming and Human Memory Systems," *Science* 247, no. 4940 (1990): 301-06, <https://doi.org/10.1126/science.2296719>.
62. John Mace, "Priming Involuntary Autobiographical Memories," *Memory* 13, no. 8 (2005): 874-84, <https://doi.org/10.1080/09658210444000485>.
63. Bargh and Chartrand, "Studying the Mind in the Middle," 253-85.
64. Nico H. Frijda, "Emotion Experience and its Varieties," *Emotion Review* 1, no. 3 (2009): 264-71, <https://doi.org/10.1177%2F1754073909103595>.
65. Randall K. Minas et al., "Triggering Insight: Using Neuroscience to Understand How Priming Changes Individual Cognition During Electronic Brainstorming," *Decision Sciences* 49, no. 5 (2018): 788-826, <https://doi.org/10.1111/deci.12295>.
66. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
67. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
68. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
69. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
70. Sebastien Hélie and Ron Sun, "Incubation, Insight, and Creative Problem Solving: A Unified Theory and a Connectionist Model," *Psychological Review* 117, no. 3 (2010): 994-1024, <https://psycnet.apa.org/doi/10.1037/a0019532>.
71. Ohlsson, *Deep Learning*, 53-85.
72. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44; Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
73. Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (New York, NY: Public Affairs, 2013), 104.
74. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
75. Ash, Cushen, and Wiley, "Obstacles in Investigating the Role of Restructuring in Insightful Problem Solving," 6-41.
76. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
77. Leon Festinger, *A Theory of Cognitive Dissonance* (Stanford, CA: Stanford University Press, 1957), 3.
78. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
79. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
80. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
81. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
82. Klein, *Seeing What Others Don't*, 104.
83. Klein, *Seeing What Others Don't*, 104.

84. Klein, *Seeing What Others Don't*, 27-28.
85. James G. March, *A Primer on Decision Making: How Decisions Happen* (New York, NY: Free Press, 1994), 24.
86. Isaksen, "Unleashing Creative Talent in Organizations," 345-98.
87. James C. Kaufman and Ronald A. Beghetto, "Beyond Big and Little: The Four C Model of Creativity," *Review of General Psychology* 13, no. 1 (2009): 1-12, <https://doi.org/10.1037%2Fa0013688>.
88. Robert J. Sternberg, "A Three-Facet Model of Creativity," in *The Nature of Creativity*, ed. Robert J. Sternberg (Cambridge, UK: Cambridge University Press, 1988), 125-47.
89. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
90. James G. March, *The Ambiguities of Experience* (Ithaca, NY: Cornell University Press, 2010), 75; Rothenberg, *Flight from Wonder*, 7-12.
91. Gary Klein, Brian Moon, and Robert R. Hoffman, "Making Sense of Sensemaking 1: Alternative Perspectives," *IEEE Intelligence Systems* 22, no. 4 (2006): 70-73, <https://doi.org/10.1109/MIS.2006.75>.
92. Andrew D. Brown, Ian Colville, and Annie Pye, "Making Sense of Sensemaking in *Organization Science*," *Organization Studies* 36, no. 2 (2014): 265-77, <https://doi.org/10.1177%2F0170840614559259>.
93. Klein, Moon, and Hoffman, "Making Sense of Sensemaking 1," 70-73.
94. Klein, Moon, and Hoffman, "Making Sense of Sensemaking 1," 70-73.
95. Klein, Moon, and Hoffman, "Making Sense of Sensemaking 1," 70-73; Karl E. Weick, Kathleen M. Sutcliffe, and David Obstfeld, "Organizing and the Process of Sensemaking," *Organization Science* 16, no. 4 (2005): 409-21, <https://doi.org/10.1287/orsc.1050.0133>.
96. Neil Anderson, Kristina Potocnik, and Jing Zhou, "Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework," *Journal of Management* 40, no. 4 (2014): 1297-333, <https://doi.org/10.1177%2F0149206314527128>.
97. Anderson, Potocnik, and Zhou, "Innovation and Creativity in Organizations," 1297-333.
98. Jung S. Kim and Goo H. Chung, "Implementing Innovations within Organizations: A Systematic Review and Research Agenda," *Innovation: Organization & Management* 19, no. 3 (2017): 372-99, <https://doi.org/10.1080/14479338.2017.1335943>.
99. Kaufman and Beghetto, "Beyond Big and Little," 1-12.
100. Kaufman and Beghetto, "Beyond Big and Little," 1-12.
101. Mark A. Runco, "Creativity," *Annual Review of Psychology* 55 (2004): 657-87, <https://doi.org/10.1146/annurev.psych.55.090902.141502>.
102. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
103. Runco, "Creativity," 657-87.
104. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
105. Wallas, *The Art of Thought*, 79-107.
106. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
107. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
108. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
109. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
110. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
111. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
112. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
113. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
114. Wallas, *The Art of Thought*, 82.
115. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.

116. Wallas, *The Art of Thought*, 79-107.
117. Wallas, *The Art of Thought*, 79-107.
118. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
119. Dane and Pratt, "Exploring Intuition and its Role in Managerial Decision Making," 33-54; Daniel Kahneman, "A Perspective on Judgment and Choice: Mapping Bounded Rationality," *American Psychologist* 58, no. 9 (2003): 687-720, <https://psycnet.apa.org/doi/10.1037/0003-066X.58.9.697>.
120. Mihaly Csikszentmihalyi, "Society, Culture, and Person: A Systems View of Creativity," in *The Nature of Creativity*, ed. Robert J. Sternberg (Cambridge, UK: Cambridge University Press, 1988), 325-39.
121. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
122. Csikszentmihalyi, "Society, Culture, and Person," 325-39.
123. Csikszentmihalyi, "Society, Culture, and Person," 325-39.
124. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
125. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
126. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
127. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
128. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
129. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
130. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.
131. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-352; Wallas, *The Art of Thought*, 79-107.
132. Wallas, *The Art of Thought*, 79-107.
133. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
134. Ahmed M. Abdulla, Sue H. Paek, Bonnie Cramond, and Mark A. Runco, "Problem Finding and Creativity: A Meta-Analytic Review," *Psychology of Aesthetics, Creativity, and the Arts* 14, no. 1 (2020): 3-14, <https://psycnet.apa.org/doi/10.1037/aca0000194>.
135. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
136. Rothenberg, *Flight from Wonder*, 60-71.
137. Scott G. Isaksen and Hans J. Akkermans, "Creative Climate: A Leadership Lever for Innovation," *Journal of Creative Behavior* 45, no. 3 (2011): 161-87, <https://doi.org/10.1002/j.2162-6057.2011.tb01425.x>.
138. Runco, "Creativity," 657-87.
139. Anderson, Potocnik, and Zhou, "Innovation and Creativity in Organizations," 1297-333.
140. James G. March, *The Ambiguities of Experience* (Ithaca, NY: Cornell University Press, 2010), 74-93.
141. March, *The Ambiguities of Experience*, 74-93.
142. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Runco, "Creativity," 657-87; Wolfberg, "A Theory of Overload and Equivocality Effects on Learning during Knowledge Transfer within Policy Making Dyads."
143. Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, no. 2 (1973): 155-69, <https://link.springer.com/article/10.1007/bf01405730>.
144. Thomasingar, *Reducing Uncertainty: Intelligence Analysis and National Security* (Stanford, CA: Stanford Security Studies, 2011), 1-18; Gregory F. Treverton, *New Tools for Collaboration: The Experience of the U.S. Intelligence Community* (Washington, DC: Center for Strategic and International Studies, 2016).
145. Klein, *Seeing What Others Don't*, 27-28.
146. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
147. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.

148. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44; Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
149. Damasio, *Descartes' Error*, 128-30.
150. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
151. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29.
152. John H. Mace et al., "Semantic Memories Prime Autobiographical Memories: General Applications and Implications for Everyday Autobiographical Remembering," *Memory and Cognition* 47, no. 2 (2019): 299-312, <https://link.springer.com/article/10.3758/s13421-018-0866-9>.
153. Eva V. Hoff, "Imagination," in vol 1, *Encyclopedia of Creativity*, ed. Mark A. Runco and Steven R. Pritzker (Cambridge, MA: Academic Press), 617-23.
154. Damasio, *Descartes' Error*, 128-30.
155. Mace et al., "Semantic Memories Prime Autobiographical Memories," 299-312.
156. Andrew B. Hargadon and Beth A. Bechky, "When Collections of Creatives Become Creative Collectives: A Field Study of Problem Solving at Work," *Organization Science* 17, no. 4 (2006): 484-500, <https://doi.org/10.1287/orsc.1060.0200>.
157. Mark D. Vagle, *Crafting Phenomenological Research* (New York, NY: Routledge, 2016); John Van Maanen, *Tales of the Field: On Writing Ethnography*, 2nd ed. (Chicago, IL: University of Chicago Press, 2011).
158. Rothenberg, *Flight from Wonder*, 60-71.
159. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
160. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
161. Dunbar, "How Scientists Really Reason," 365-95.
162. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
163. Vagle, *Crafting Phenomenological Research*.
164. Van Maanen, *Tales of the Field*, 10.
165. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52.
166. Vagle, *Crafting Phenomenological Research*.
167. Diane M. Stutey et al., "The Practice of Bridling: Maintaining Openness in Phenomenological Research," *Journal of Humanistic Counseling* 59, no. 2 (2020): 144-56, <https://doi.org/10.1002/johc.12135>.
168. Travis Morris and John P. Crank, "Toward a Phenomenology of Terrorism: Implications for Research and Policy," *Crime, Law and Social Change* 56, no. 3 (2011): 219-42, <https://link.springer.com/article/10.1007/s10611-011-9310-9>.
169. Adrian Wolfberg, "The President's Daily Brief: Managing the Relationship between Intelligence and the Policy-maker," *Political Science Quarterly* 132, no. 2 (2017): 225-58, <https://doi.org/10.1002/polq.12616>.
170. Sally Maitlis and Thomas B. Lawrence, "Triggers and Enablers of Sensegiving in Organizations," *Academy of Management Journal* 50, no. 1 (2007): 57-84, <https://doi.org/10.5465/amj.2007.24160971>.
171. Adrian Wolfberg, "When Generals Consume Intelligence: The Problems That Arise and How They Solve Them," *Intelligence and National Security* 32, no. 4 (2017): 460-78, <https://doi.org/10.1080/02684527.2016.1268359>.
172. Adrian Wolfberg, "How Information Overload and Equivocality Affect Law Enforcement Intelligence Analysts: Implications for Learning and Knowledge Production," *Journal of Intelligence & Analysis* 23, no. 1 (2017): 17-35.
173. J. Richard Hackman, "Time and Transitions," in *Doing Exemplary Research*, ed. Peter Frost and Ralph Stablein (Newbury Park, NJ: Sage Publications, 1992), 73-81.
174. Joseph A. Maxwell, *Qualitative Research Design: An Interactive Approach* (Thousand Oaks, CA: Sage Publications, 2005).
175. Kathy Charmaz, *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis* (Thousand Oaks, CA: Sage Publications, 2006).

176. Karen Locke, Karen Golden-Biddle, and Martha S. Feldman, "Making Doubt Generative: Rethinking the Role of Doubt in the Research Process," *Organization Science* 19, no. 6 (2008), 907-18, <https://doi.org/10.1287/orsc.1080.0398>.
177. Arthur S. Hulnick, "Intelligence Producer-Consumer Relations in the Electronic Era," *International Journal of Intelligence and Counterintelligence* 24, no. 4 (2011): 747-56, <https://doi.org/10.1080/08850607.2011.598812>; Kevin Lim, "Big Data and Strategic Intelligence," *Intelligence and National Security* 31, no. 4 (2016): 619-35, <https://doi.org/10.1080/02684527.2015.1062321>; Eran Zohar, "Intelligence Analysis as a Manifestation of a Grounded Theory," *International Journal of Intelligence and Counterintelligence* 26, no. 1 (2013): 130-60, <https://doi.org/10.1080/08850607.2012.705659>.
178. Zohar, "Intelligence Analysis as a Manifestation of a Grounded Theory," 130-60.
179. John W. Creswell and Vicki L. Plano Clark, *Designing and Conducting Mixed Methods Research*, 2nd ed. (Los Angeles, CA: Sage Publications, 2011).
180. Wolfberg, "How Information Overload and Equivocality Affect Law Enforcement Intelligence Analysts," 17-35.
181. Patrick Biernacki and Dan Waldorf, "Snowball Sampling: Problems and Techniques of Chain Referral Sampling," *Sociological Methods & Research* 10, no. 2 (1981): 141-63, <https://doi.org/10.1177%2F004912418101000205>.
182. Sternberg, "A Three-Facet Model of Creativity," 125-47.
183. John W. Creswell, *Qualitative Inquiry and Research Design: Choosing Among Five Traditions* (Thousand Oaks, CA: Sage Publications, 2007).
184. Anthony J. Onwuegbuzie and Kathleen M.T. Collins, "A Typology of Mixed Methods Sampling Designs in Social Science Research," *The Qualitative Report* 12, no. 2 (2007): 281-316, <http://www.nova.edu/ssss/QR/QR12-2/onwuegbuzie2.pdf>.
185. Donald A. Schön, *The Reflective Practitioner* (New York, NY: Basic Books, 1983), 54-59.
186. Government Accountability Office, *Intelligence Community: Additional Actions Needed to Strengthen Workforce Diversity Planning and Oversight* (Washington, DC: Government Accountability Office, 2020), <https://www.gao.gov/assets/gao-21-83.pdf>.
187. David C. Rubin, "Introduction," in *Autobiographical Memory*, ed. David C. Rubin (New York, NY: Cambridge University Press, 1986), 3-16.
188. Jennifer M. Talarico, Kevin S. LaBar, and David C. Rubin, "Emotional Intensity Predicts Autobiographical Memory Experience," *Memory & Cognition* 32, no. 7 (2004): 1118-32, <https://link.springer.com/article/10.3758/BF03196886>.
189. Andrew H. Van de Ven, *Engaged Scholarship: A Guide for Organizational and Social Research* (Oxford, UK: Oxford University Press, 2007), 143-56.
190. Johnny Saldaña, *The Coding Manual for Qualitative Researchers* (Los Angeles, CA: Sage Publications), 1-40.
191. Saldaña, *The Coding Manual for Qualitative Researchers*, 1-40.
192. Saldaña, *The Coding Manual for Qualitative Researchers*, 1-40.
193. Van Maanen, *Tales of the Field*, 1-34.
194. Van Maanen, *Tales of the Field*, 1-34.
195. Gregory F. Treverton, "Risks and Riddles," *Smithsonian Magazine* 38, no. 3 (2007): 98-102, <http://www.smithsonianmag.com/people-places/risks-and-riddles-154744750/?all>.
196. Treverton, "Risks and Riddles," 98-102.
197. Festinger, *A Theory of Cognitive Dissonance*, 9.
198. Bargh and Chartrand, "Studying the Mind in the Middle," 253-85.
199. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
200. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.

201. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.
202. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63.
203. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.
204. Kaufman and Beghetto, "Beyond Big and Little," 1-12.
205. John Ferris and Michael I. Handel, "Clausewitz, Intelligence, Uncertainty and the Art of Command in Military Operations," *Intelligence and National Security* 10, no. 1 (1995): 1-58, <https://doi.org/10.1080/02684529508432286>.
206. Ferris and Handel, "Clausewitz, Intelligence, Uncertainty and the Art of Command in Military Operations," 1-58.
207. Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
208. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29; Klein, *Seeing What Others Don't*, 27-28.
209. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29; Klein, *Seeing What Others Don't*, 27-28; Festinger, *A Theory of Cognitive Dissonance*, 9.
210. Klein, *Seeing What Others Don't*, 27-28.
211. Ohlsson, "The Dialectic between Routine and Creative Cognition," 8-29; Klein, *Seeing What Others Don't*, 27-28.
212. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107; Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
213. Bargh and Chartrand, "Studying the Mind in the Middle," 253-85; Mace, "Priming Involuntary Autobiographical Memories," 874-84.
214. Damasio, *Descartes' Error*, 128-30; Frijda, "Emotion Experience and its Varieties," 264-71.
215. Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.
216. Minas et al., "Triggering Insight," 788-826.
217. Ohlsson, "Information-Processing Explanations of Insight and Related Phenomena," 1-44.
218. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107; Klein and Jarosz, "A Naturalistic Study of Insight," 346-47.
219. Edward Vul and Harold Pashler, "Incubation Benefits Only After People Have Been Misdirected," *Memory & Cognition* 35, no. 4 (2007): 701-10, <https://link.springer.com/article/10.3758/BF03193308>.
220. Sophie Ellwood et al., "The Incubation Effect: Hatching a Solution?" *Creativity Research Journal* 21, no. 1 (2009): 6-14, <https://doi.org/10.1080/10400410802633368>.
221. Isaksen and Akkermans, "Creative Climate," 161-87.
222. Josh Kerbel and Anthony Olcott, "Synthesizing with Clients, Not Analyzing for Customers," *Studies in Intelligence* 54, no. 4 (2010): 11-27, <https://www.cia.gov/static/348826ddda4ef2b3786266010cb1881b/Synthesizing-with-Clients.pdf>.
223. Uri Bar-Joseph and Arie W. Kruglanski, "Intelligence Failure and Need for Cognitive Closure: On the Psychology of the Yom Kippur Surprise," *Political Psychology* 24, no. 1 (2003): 75-99, <https://doi.org/10.1111/0162-895X.00317>.
224. Jervis, *Why Intelligence Fails*, 189-93.
225. Martin Petersen, "What I Learned in 40 Years of Doing Intelligence Analysis for US Foreign Policymakers," *Studies in Intelligence* 55, no. 1 (2011): 13-19, https://www.globalstudies.uci.edu/files/docs/2014/what_i_learned.pdf.
226. Keith Sawyer, *Group Genius: The Creative Power of Collaboration* (New York, NY: Basic Books), 11-12.
227. Robert E. Quinn, *Deep Change: Discovering the Leader Within* (San Francisco, CA: Jossey-Bass Publishers, 1996), 134-43.
228. Teresa M. Amabile et al., "Leader Behaviors and the Work Environment for Creativity: Perceived Leader Support," *The Leadership Quarterly* 15, no. 1 (2004): 5-32, <https://doi.org/10.1016/j.leaqua.2003.12.003>.

229. Scott G. Isaksen, "Leadership's Role in Creative Climate Creation," in *Handbook of Research on Leadership and Creativity*, ed. Michael D. Mumford and Sven Hemlin (Northampton, MA: Edward Elgar, 2017), 131-58.
230. Csikszentmihalyi and Sawyer, "Creative Insight," 329-63; Sadler-Smith, "Wallas' Four-Stage Model of the Creative Process," 342-52; Wallas, *The Art of Thought*, 79-107.
231. James G. March, "Exploration and Exploitation in Organizational Learning," *Organization Science* 2, no. 1 (1991): 71-87, <https://doi.org/10.1287/orsc.2.1.71>.
232. March, "Exploration and Exploitation in Organizational Learning," 85.
233. Fingar, *Reducing Uncertainty*, 1-18.
234. Amy C. Edmondson, "Psychological Safety and Learning Behavior in Work Teams," *Administrative Science Quarterly* 44, no. 2 (1999): 350-83, <https://doi.org/10.2307/2666999>; Bill McEvily, Vincenzo Perrone, and Akbar Zaheer, "Trust as An Organizing Principle," *Organization Science* 14, no. 1 (2003): 91-103, <https://doi.org/10.1287/orsc.14.1.91.12814>.
235. Adrian Wolfberg, "Re-Thinking Time: Adopting a Mindset for Interpreting Threats and Imagining Opportunities," *Research Short* (Washington, DC: National Intelligence Press, 2022); Barbara Adam, "The Temporal Gaze: The Challenge for Social Theory in the Context of GM Food," *British Journal of Sociology* 51, no. 1 (2000): 125-42, <https://doi.org/10.1111/j.1468-4446.2000.00125.x>.
236. Sawyer, *Group Genius*, 71.
237. Adrian Wolfberg, "Dark Side of Clarity: Its Effect on Knowledge Production and Decision-Making," *Salus Journal* 5, no. 1 (2017): 1-26, http://scci.csu.edu.au/salusjournal/wp-content/uploads/sites/29/2017/03/Wolfberg_Salus_Journal_Volume_5_Number_1_2017_pp_1-26.pdf.
238. Fingar, *Reducing Uncertainty*, 1-18.
239. Hargadon and Bechky, "When Collections of Creatives Become Creative Collectives," 484-500.
240. Wallas, *The Art of Thought*, 79-107.

