INTUITIVE DECISIONMAKING: TACIT KNOWING IN ACTION
BY U.S. ARMED FORCES OFFICERS IN 2011

by

JON H. MOILANEN

B.A., University of Wisconsin-Oshkosh, 1973

M.A., Indiana University of Pennsylvania, 1987

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Department of Educational Leadership

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2012

Abstract

This qualitative inquiry was a naturalistic exploration of participants' perception or understanding of their intuitive decisionmaking processes. A bounded case study explored how a purposeful sampling of U.S. Armed Forces officers−primarily U.S. Army officers−perceived or understood intuitive decisionmaking in the context of their experiences in contemporary military missions. The purposeful sample was comprised of ten volunteer participants attending their professional Intermediate Level Education (ILE) course in 2011 at the U.S. Army Command and General Staff College.

The review of relevant literature used Polanyi's (1958) theory of tacit knowing and personal knowledge [intuition] in making decisions as a philosophical and psychological baseline. U.S. Army doctrine promoted implicit [intuitive] and analytical [deliberate] decisionmaking. Army doctrinal guidance stated that in situations severely constrained in time and requiring an immediate decision, Army leaders rely significantly on intuition. A complementary concept advocated creative and critical thinking in order to adaptively solve problems. However, minimal emphasis on intuitive processes and rescinding the term *intuitive decisionmaking* in Army doctrine indicated a significant gap in Army leader development.

This research augmented professional literature on the *art* and science of military leadership and decisionmaking in the second decade of the 21st century. The exploratory study encouraged further research on how U.S. Armed Forces officers perceive discrete elements or emergent patterns among complex environmental stimuli; understand their tacit knowledge to sense situational cues affecting a problem; and develop their intuitive acumen as a complement to experience and learning toward professional expertise. The participants' candid insights on their lived and vicarious experiences in intuitive decisionmaking suggested similar leadership value to the adult education community. Other practical benefits included an improved self-efficacy of participants to trust their personal intuition and expertise, and to further explore their tacit knowledge for effective day-to-day living in an ever-changing complex and uncertain world. The experiences of participants indicated the believability of Polanyi's premise that "we can know more than we can tell." (Polanyi, 1964, p. x).

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Approved by:

Major Professor
Sarah Jane Fishback, Ph.D

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Dedication

To *Sweet Jenny* – My Wife and Best Friend

with whom, I am.

And had I been without,

would never be.

Preface

This dissertation was a qualitative study to explore the nature of intuitive decisionmaking as perceived or understood by intermediate U.S. Armed Forces officers in 2011. A small purposeful sample of ten commissioned officers−Army, Navy, and Air Force−shared their recollections, insights, and perceptions or understanding of intuitive decisionmaking.

The audience that this case affected most directly was the purposeful sample. They heard themselves as they expressed their sense-making of *intuition* that resided behind the veneer of a personal or vicarious intuitive experience. Their vignettes sometimes uncovered a cue or prompts that enacted an intuitive decision; however, other experiences remained masked with a comment that they "just knew." The larger audiences that gained awareness from this study were the U.S. Army and the adult education community-at-large. All audiences were interested in *learning*.

A definitive answer to research questions continued to elude the researcher and the participants on how to fully understand the phenomenon of intuitive decisionmaking. But findings provided avenues for continued research, and recommendations from the study pointed to azimuths that appeared lucrative for further exploration. The quest continues:

> I want to talk about learning….I am talking about any learning in which the experience of the learner progresses along this line: "No, no, that's not what I want"; "Wait! This is closer to what I'm interested in, what I need"; "Ah, here it is! Now I'm grasping and comprehending what I need and what I want to know!" (Rogers, 1983, pp. 18-19).

Chapter 1 - Introduction

We can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell.

Polanyi

This research explored participants' perception or understanding on the phenomenon of intuitive decisionmaking. The contextual conditions were their recollections of personal and vicarious experiences during contemporary military missions.

The U.S. Army described two fundamental forms of decisionmaking as analytic or intuitive, and stated that decisionmaking often combines deliberate analysis and intuitive knowing. This combination was a cognitive network of critical and creative thinking for adaptive problem solving. U.S. Army doctrine stated that when time is not available for deliberate analysis of conditions and an immediate decision is required, leaders use *intuition* in their decisionmaking (*The Operations Process*, 2011, p. 5-12). However, minimal emphasis on intuitive processes in Army doctrine was compounded when the Army rescinded the term *intuitive decisionmaking* in Army doctrine in 2011. These actions widened a significant gap in the Army leader development on decisionmaking. This doctrinal gap suggested that Army leaders may not be as effectively prepared to act correctly in moments of complex crisis when intuitive decisionmaking was required. This study's quest was to better understand the nature of intuitive decisionmaking in the real world life experiences and lifelong learning of the participants.

This research elicited what each participant perceived or knew as intuitive decisionmaking. Examples of intuition were often recalled as personal cues or prompts that triggered knowing intuitively what to do. Other recollections suggested how a participant internalized their experiences−personal or vicarious−in order to fortify their self-efficacy to make effective future intuitive decisions in time-constrained crisis.

Background

The United States of America has been at war for over ten consecutive years. The U.S. Army has been engaged constantly in large and small scale combat operations since the attack on the United States of America on September 11, 2001.

As participants in this research were preparing to start their midcareer professional education course, the Army's Chief of Staff stated, "This is the longest period of continuous combat ever for our all-volunteer force" (Casey, 2010, p. 20). In October 2011, U.S. Secretary of Defense Panetta commented on the continuous leadership challenges facing leaders in the Armed Forces. He said:

> We've been at war for 10 years, putting a heavy burden on our men and women in uniform to defend our nation and to defend our interests. More than 6,200 have given their lives, and more than 46,000 have been wounded during these wars that we've engaged in since 9/11. These conflicts have wrought untold stresses and strains on our service members and, obviously, on their families as well. But despite it all, we really have built the finest, most experienced, most battle-hardened all-volunteer force in our nation's history (Panetta, 2011, para. 5).

In accepting their Federal commission and oath of office, U.S. Armed Forces officers knew that they could be ordered to place their life, and the lives of others in danger, on a moment's notice during the normal conduct of their duties. Army officers and officers of the other U.S. Armed forces were the leaders in a *profession of arms*. The challenge was significant. In October, 2011 as the newly assigned Chairman of the U.S. Joint Chiefs of Staff, General Dempsey stated, "We must continue to learn, to *understand*, and to promote the knowledge, skills, attributes, and behaviors that define us as a profession." (Dempsey, 2011a, para. 9).

During this same period, Secretary of the Army John M. McHugh stated that a vital Army mission was to sustain an organization of people─the Army─as leaders and soldiers "who can operate with comfort and confidence in an environment of *uncertainty* [emphasis added]" (McHugh, 2010, p. 16). Integral to the Army's response was a campaign of professional learning designed to improve how leaders understand and act in the *complexity* and uncertainty of contemporary environments. A doctrinal adaptation to traditional military decisionmaking had emphasized understanding complex problems more fully before seeking to solve them (Dempsey, 2010). This concept demanded critical and creative thinking to make sense of *dynamic* conditions. The 2011 update of this Army decisionmaking doctrine amplified that in time constrained environments, [the decisionmaker] may "rely even more than normal on their expertise, *intuition*, and creativity" (*The Operations Process*, 2011, p. B-38).

The Real World Environment

Army doctrine spotlighted uncertain and complex conditions of the contemporary "real world" and emphasized the types of dangerous enemy that will be confronted: "Expect to remain engaged for the next several decades in a persistent conflict against an enemy dedicated to U.S. defeat as a nation and eradication as a society" (*Operations*, 2008, p. viii). Other doctrinal challenges indicated that the decisions Army officers make and the actions that result would have a cumulative effect on vital interests of the United States of America.

The newly appointed Chief of Staff of the Army highlighted the ongoing pace of change and *requirements* for leader development and effective decisionmaking: "Let me put a fine edge on what it means to be *adaptable*….Faster, flatter, more collaborative and always resource sensitive….It means *revision of doctrine* [emphasis added], training methodologies, and leader development strategies" (Dempsey, 2011, para. 20). Nonetheless, by the end of 2011 the professional dialogue on intuitive decisionmaking appeared to be unresolved, and crises were expectant and ongoing in the real world of the participants.

During this period, U.S. international missions spanned wartime crises in or near Afghanistan; multinational transitions and turmoil in the Mideast, Africa, and regional areas such as Iraq and Iran; as well as contingencies for rapid deployment to any area of the world on missions ranging from peaceful humanitarian relief in a natural disaster to the combat of general war among nations. As priorities of effort shifted among military missions on a global scale, the U.S. Secretary of the Army and the Chief of Staff of the Army reported to the U.S. Congress: "The campaigns in Iraq and Afghanistan continue to create demands that have our Army operating *beyond sustainable capacity* [emphasis added]" (McHugh & Casey, 2010, p. 6). In November 2011, the Honorable J. M. McHugh commented to a public audience that "America should also be reminded that our sons and daughters are still in harm's way−and not just in Iraq and not just in Afghanistan, but, in fact, in some 80 countries across this planet−doing the hard work of freedom−quietly−effectively."

During 2011, U.S. Army leaders reported that challenges were ever-present, and "the war is not over yet; we still face a ruthless foe" (McHugh & Casey, 2011, p. 11). "An uncertain and complex future security environment demands that Army leader development prepare leaders to operate with competence and confidence in ambiguous, frequently changing circumstances" (*Army Leader Development*, 2009, p.13). The Army had published its assessment on these

essential professional missions and stressful requirements in support of U.S. Federal policies: Army leaders were to optimize their analytical skills and intuitive sensing for efficient and effective decisionmaking and actions.

Stated succinctly in earlier Army doctrine, "There are two ways to make decisions: analytic and intuitive" (*Mission Command*, 2003, p. 2-3). Intuition "in this context is the insight or *immediate understanding* [emphasis added] that rapidly dismisses impractical solutions and moves to a feasible COA [course of action]" (p. 2-4). Leaders were expected to adapt rapidly−in some cases instantaneously−to changes in their environment. Advances in decisionmaking were to be evidenced in "exploiting emerging opportunities by applying a combination of intuition [and] analytical problem solving" (*Army Leadership*, 2006, p. 11-3).

An issue emerged in U.S. Army doctrine. Intuitive decisionmaking was described with a multitude of terms to characterize personal attributes that complement the ability to make intuitive decisions, but did not describe a practical essence of intuitive decisionmaking. In an analytical model, Army doctrine displayed a precise sequence of actions for deliberate solving of problems. However, Army doctrine had historically presented intuition as an ill-defined cognitive process when compared and contrasted to the Army's analytical decisionmaking model.

U.S. Army doctrine evolved. The 2010 version of *The Operations Process* described decisionmaking, but did not add clarity to the concept of intuition. An excerpt stated that "decisionmaking is a cognitive process—it happens in the minds of individuals. Individuals receive information and process it differently based on their intellect, education, culture, and past experiences" (p.1-6). Depending on the situation, leaders were to rely heavily on *intuition* [emphasis added] in order to inform their decisionmaking. "Sometimes that knowledge appears as *immediate knowing or feeling* (*intuition*) [emphasis added]" (*The Operations Process,* 2010, p.1-6). In other situations, cognitive effort was to use a more deliberate process.

Based on the situation, Army leaders were to consider multiple methods to help them understand situations and make decisions. These ways included critical and creative thinking, rapid decisionmaking and synchronization, the military decisionmaking process (MDMP), and procedures with a basis "to analyze a mission, develop a plan, and prepare for an operation" (p. C-1). The 2011 update to *The Operations Process* doctrine accented that "when lacking time to perform the MDMP or quickness of action is desirable, commanders make an immediate

adjustment decision–using *intuitive* decisionmaking….Validating and refining action is a rapid and largely intuitive activity" (2011, pp. 5-12 and 5-14).

Although this doctrinal description was less than exact regarding intuition, the Army had acknowledged earlier that "doctrine cannot be reduced to science; it is inherently *art* [emphasis added]" (*Mission Command*, 2003, p. 1-3). The *art of command* suggested an avenue for expanded inquiry.

Foundations in Tacit Knowing Literature

This research used the philosophical tenets of Polanyi's (1958) theory of tacit knowing and personal knowledge as a foundation to focus the relevant literature review on intuition and decisionmaking. Polanyi (1958) suggested that critical and creative thinking can discern, with tempered empirical and aesthetic appreciation, key aspects of an environment. However, Polanyi (1958) stated clearly that knowledge cannot be completely explicit. He proposed that *dynamic* interrelationships of constituent elements in an environment are often obscured based on the bias or capacity of an individual to perceive or understand. In such an instance, implicit cues to meaning in a specific environment often remained beyond a personalized ability to perceive and understand their significance (Polanyi, 1958, 1964, 1966).

Earlier 20th century scientific propositions on gestalt psychology and perception studies by Wertheimer (1913, 1945) and his close associates Koffka (1935) and Köhler (1947) influenced Polanyi on how people associate varied stimuli in a particular setting in order to make implicit meaning (Polanyi, 1966). Wertheimer (1945) promoted investigating beyond an apparent relationship, such as a stroboscopic effect where there is a perception of movement represented by a series of stationary images displayed for a moment in very rapid succession. The illusion was apparent motion where no motion actually existed. He researched for meaning of such a phenomenon as part of an integrated whole or *joint form,* and a meaningful understanding of a joint form and the interrelationship of discrete parts, the joint form, *and* impacts of an encompassing contextual space.

Schön (1987) presented an elegant educational model in a similar context of appreciating, practicing, and learning the science and *art* [emphasis added] of a profession. He stated this learning as "an art of problem *framing*, an art of implementation, and an art of improvisation–all necessary to mediate the use in practice of applied science and technology" (p. 13). Schön's

example of assessing architectural projects in a design studio class suggested that "learning to design sometimes takes the form of making explicit what one already knows how to do… *intuitively* [emphasis added] you look at the shape and you know it is wrong, but it's hard to get down to the reason" (p. 87).

Polanyi (1966) proposed that perception and understanding can be advanced in some people through dedicated training, recurring experiences, and mentorship as in the development of an artisan, and is even more pronounced in the form of artistic genius. This model and its praxis reinforced self-efficacy when complemented with constructive and timely expert feedback on performance, and an individual's critical self-reflection and ability on cognitive-affective-biological sensings (Bandura, 1997; Schön, 1987).

Avenues of Exploration in Army Literature

The intent of gaining a better understanding of intuitive decisionmaking from a U.S. Army perspective was critical to this exploratory study. The perception by participants on improved understanding was elusive. Yet by inference, the Army doctrinal description of intuition indicated that *tacit knowing* existed and allowed a person to apprehend an issue and perceive an immediate meaning. This perception was emergent as a comprehension for immediate decision on action. In earlier doctrine, the Army expected leaders "to visualize *intuitively* the effects of possible decisions" (*Mission Command*, 2003, p. 1-21). This statement suggested an immediacy of understanding−intuitively−to know. Even more salient in professional expectation, Army doctrine stated, "because uncertainty and time drive most decisions, commanders *emphasize* [emphasis added] intuitive decisionmaking as the norm" (p. 2-12).

Perception appeared to be tacit integration of implicit knowing. A priori knowledge, unrecognized consciously by an individual at the moment of intuition, appeared to be based on past experiences and stored memory unknown explicitly by the individual (Goldberg, 2005). The Army indicated this possibility as follows: "This 'art' comes from a combination of the [leader's] experience, training, and study" (*Mission Command*, 2003, p. 2-4).

Reviewing U. S. Army literature in the two previous decades indicated many projects to study and codify how Army officers use *tacit knowledge* and learn to make effective decisions rapidly in complex, uncertain, time-constrained environments. The Army used social science and behavioral science experts from its own organizational resources and experts from civilian

academia and social science fields. (Halpin, Banks, Black, Foland, Jacobs, Thompson & Fallesen, 1994; Hedlund, Sternberg, Horvath, Forsythe & Snook, 1999; Hogarth, Williams, Horvath, Snook & Wattendorf, 1998; Cianciolo, Antonakis & Sternberg, 2001; Matthew, Cianciolo & Sternberg, 2005; Fisher, Spiker & Riedel, 2009).

Much of the Army research had been sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in locations throughout the Army. Critical thinking and analytic decisionmaking remained an approved adult learning model in U.S. Army doctrine. Flexibility, agility, and versatility were lauded as leader attributes to assist in making rapid decisions to resolve complex, ambiguous problems in dynamic situations.

Evidence suggested that intuition may have a significant role in these types of "in-action" decisions. Nonetheless, less research by the Army in recent years on intuitive studies indicated less interest to explore a paradigm for educating adults in time-sensitive situations which require *intuitive* decisions. Current research attention appeared to be more focused on the deliberate functions of critical thinking (Fischer, et al. 2009). This suggested that a significant lapse existed in perceiving, understanding, and applying intuition in Army leader decisionmaking.

Contemporary Perspectives of 2011

As the officers who participated in this research prepared to graduate from their professional military education experience at Fort Leavenworth in December 2011, the U.S. Chief of Staff of the Army (CSA), General Odierno, stated his assessment of the contemporary world conditions to members of the U.S. Senate:

> The world is more unstable than ever: continued terrorism threats, an unstable Middle East, Iran, Pakistan, North Korea, rising powers, failed and failing states [nations]…all are issues that will be present for the near term and well into the future (Odierno, 2011, para. 12).

In mid-December 2011, the Vice Chief of Staff of the Army (VCSA), General Peter Chiarelli, presided at the graduation ceremony for the Intermediate Level Education (ILE) course at the Army's Command and General Staff College in Fort Leavenworth, Kansas. The research participants were aware that U.S. military forces were exiting Iraq and major combat actions continued in Afghanistan. The participants knew that even with this major shift of U.S. Armed

Forces and U.S. presence in the Middle East, a complex and *uncertain* environment with operational stresses was one certainty after graduation and their subsequent deployments to duties at diverse locations throughout the world. General Chiarelli stated:

> We are navigating what is uncharted territory…We've always had volunteers in our force. We've never fought for 10 years, let alone in an all-volunteer force. We have never downsized when we still have forces committed [to combat]…this is uncharted territory (Chiarelli, 2011, para. 13).

A dilemma remained for these midcareer leaders of how to effectively perceive or understand their intuitive decisionmaking. They had been educated, experienced, and succeeded in a deliberate process of military decisionmaking, and clearly understood this analytic method. In direct contrast, an intuitive decisionmaking process appeared to exist, but lacked a definitive description, perception, or understanding by the participants. Their recurring use of metaphors when discussing personal or vicarious intuitive decisions suggested a continuing dilemma.

Statement of the Problem

The problem of this qualitative research was how to perceive or understand the phenomenon of intuitive decisionmaking when by common definition the concept of intuition is an enigma. The *Merriam-Webster Online Dictionary* defines intuition as "direct knowledge or cognition without evident rational thought" (n.d., para. 4). The *Oxford English Dictionaries* description corresponds to this implicit description of intuition as, "the ability to understand something immediately, without need for conscious reasoning, [that is,] a thing that one knows or considers likely from instinctive feeling rather than the conscious ability to understand something immediately, without the need for conscious reasoning" (n.d., para. 1).

If this independence of reasoning precludes critical thinking at the moment of decision as a means to audit how intuitive decisionmaking occurs, understanding a model for intuitive decisionmaking was problematic. Nonetheless, the U.S. Army expected its leaders to use intuitive decisionmaking as a doctrinal norm.

Purpose

The purpose of this qualitative study was to explore the nature of intuitive decisionmaking as perceived or understood by intermediate U.S. Armed Forces officers in 2011. This research

sought to discern how ten commissioned leaders in this study−the participants−perceived the *conditions* that triggered their intuitive decisionmaking, or understood the *contextual effects* in personal or vicarious experiences of intuition.

The primary interest group of this research was U.S. Army officers and how they perceived or understood intuitive decisionmaking. Being at their midcareer professional education experience, they had ample time to reflect on current Army doctrine on intuition and decisionmaking (*Mission Command*, 2010, 2011). The purpose retained an Army focus even when an opportunity emerged to explore the professional insights of one U.S. Navy officer and one U.S. Air Force officer who volunteered to participate with eight U.S. Army officers in the purposeful sample of this study. Their personal perspectives and experiences as members of the U.S. Armed Forces demonstrated a valuable addition to this research. However, assessing Navy and Air Force doctrine was outside the scope of this particular research project. The settings for application of intuitive decisionmaking by all of the officers in the purposeful sample existed within the complex and uncertain environments of contemporary military missions and their own lifelong learning.

Research Questions

Research questions probed participants' perception or understanding of intuitive decisionmaking. The two main exploratory research questions were as follows:

- What is a participant's perception on the phenomenon of intuitive decisionmaking?
- What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?

These two questions were the basis for a group of approximately 20 research sub-questions that framed the protocol for interviewing each participant. The group of questions sought to determine how participants believed that they made meaning of their intuitive decisionmaking. Discerning experiences−personal or vicarious−allowed for participant responses that ranged   from vague conjecture to distinct descriptions in a flexible and adaptive verbal protocol. Each interview attuned to the participant and their candid dialogue with the researcher. Appendix D – "Interview Questions Protocol" explained a rationale of how these sub-questions assisted in the exploration of the two primary research questions.

Methodology

This qualitative bounded case study concentrated on the subjective meaning-making of each participant. Within a case study method, a phenomenological interest focused on "exploring how human beings make sense of experiences and transform experience into consciousness, both individually and as shared meaning" (Patton, 2002, p. 104).

Creswell's (2008) six step design for qualitative research was adapted and applied to this research and provided a logical sequence for research flow through framing a problem to be explored, conducting literature review, stating a purpose of the research, collecting data, analyzing and interpreting data, and reporting the research findings with resultant recommendations by the researcher (p.52). This adapted model is illustrated and explained in Chapter 3 of this dissertation.

The researcher was the primary instrument in this qualitative case study research, and collected and interpreted verbal and nonverbal communication with participants in an inductive manner (Merriam, 2002, pp. 5 and 179). Collection, assessment, and interpretation techniques centered on a small purposeful sample of ten participants and their individual responses from semi-structured interviews. However, the semi-structured interview process was emergent (Creswell, 2008). The questions and manner of interview evolved through phases of a focus group, a pilot interview experience, and the individual interviews of ten purposeful sample participants.

First, and prior to collecting narratives from a purposeful sampling, the researcher conducted a focus group of five U.S. Army majors from the same CGSC Intermediate Level Education (ILE) course as the purposeful sampling. This action sensed the veracity of proposed interview questions and the credibility of the research problem and purpose. The researcher adjusted question and interview techniques to enhance the interview process and case exploration.

Second, a separate group of two U.S. Army officers participated in a pilot interview in order to assess the interview protocol, narrative exchange, and a nonverbal collection plan by the researcher, interpretation process, and measures for verification to be used by the researcher. The researcher's assessment of piloting techniques indicated qualitative validity of the design and procedures for the case study research of the purposeful sampling.

Third, a purposeful sampling for research consisted of eight U.S. Army officers, one U.S. Navy officer, and one U.S. Air force officer. Research coordination and interpretation with a purposeful sampling, a group of peer experts supporting the researcher, and the researcher's self-reflections resulted in an integrated conclusion to this qualitative inquiry. Details are explained in Chapter 3 and Chapter 4 of this dissertation.

Participants' perception or understanding of intuitive decisionmaking, and what contribution personal or vicarious experiences had on a participant's perception or understanding of intuitive decisionmaking were addressed in the researcher's interpretation in Chapter 4 and Chapter 5 along three primary lines of inquiry as follows:

- Relationship of research findings to existing professional research and Army doctrinal principles on intuitive decisionmaking.
- Researcher personal reflections on the significance of observations and possible lessons learned on intuitive decisionmaking.
- Research inferences and recommendations for future study and exploration on the phenomenon of intuitive decisionmaking (Creswell, 2008, p. 57).

Population

U.S. Armed Forces officers were a readily available sample from a much larger population. Over 330 officers attended an Intermediate Level Education (ILE) course in 2011 at the U.S. Army Command and General Staff College (CGSC) at Fort Leavenworth, Kansas. The population was comprised from a population of 74,517 U.S. Armed Forces officers in the Army, Navy, Marine Corps, and Air Force as of January 31, 2011 (*Active Duty Military*, 2011). The population and purposeful sample are discussed in more detail in Chapter 3 of this dissertation.

Participants

Ten commissioned officers in the U.S. Armed Forces comprised a purposeful sample of six Army majors; one Air Force major; one Navy commander; and two Army lieutenant colonels. The research was conducted as a bounded case study during their attendance of a professional intermediate level education (ILE) course at the Army Command and General Staff College (CGSC), at Fort Leavenworth, Kansas, in 2011. The ILE course was an opportunity for these midcareer officers to be in a stabile work environment for about one year. During this

schooling, they were not deployable to dangerous duty assignments; they experienced a consistent daily educational schedule; and they had the opportunity to reflect on previous duties, lifestyle, and intuitive decisionmaking. Army doctrine reinforced this expectation to develop "…distinct bodies of knowledge and impart[ed] expertise through formal, theoretical, and practical education" (*The Army,* 2005, pp. 1-10 and 1-11).

These U.S. Armed Forces officers from the Army, Navy, and Air Force had operated as leaders for most or all of their military careers in a state of war. Making effective immediate decisions in crisis situations had been crucial for these midcareer Army officers when outcomes might result in lifesaving, injury, or death of themselves, the people under their control and responsibility, as well as other people in the immediate environment of a military action. The U.S. Navy ("Enhancing Intuitive Decision," 2012) and U.S. Air Force ("711th Human Performance," 2012) expected their officers to use intuition when appropriate in stressful conditions comparable to the Army officers. Their naval and air force insights provided complementary perspectives valuable to this research. However, assessing Navy and Air Force decisionmaking doctrine was outside the scope of this particular research project.

Senior Army civilian and military leaders stated that unexpected situations were expected to occur in contemporary military settings applicable to all U.S. Armed Forces. Their professional judgments estimated that conditions would "vary in intensity and scope, and last for uncertain durations" (McHugh & Casey, 2010, p. 2). Numerous additional senior U.S. Armed Forces and Federal officials stated that such diverse conditions would require *immediate* decisions and actions (Krulak, 1999; Duggan, 2005; McCaffrey, 2007; Gates, 2011a).

Several years earlier, the serving U.S. Secretary of the Army characterized this complex reality with a metaphor to young U.S. Army leaders: "For you, it is likely that your career never will be free of war–it will be an era of persistent conflict and persistent engagement. You will not get an inter-war break. You will be changing tires on a speeding vehicle for most of your career" (Geren, 2008, para. 4). In 2011, the U.S. Secretary of Defense offered evidence from current global events that the U.S. Armed Forces would continue to be involved in continuous forms of complex conflict as the norm (Gates, 2011b).

Limitations

This study on intuitive military decisionmaking acknowledged limitations applicable to the specific context of this research as follows:

- **Scope.** Findings and recommendations of this study would emerge from a small purposeful sample in a particular professional domain.

- **Conceptual Outcome.** Defining an explicit concept of intuitive decisionmaking process would be problematic when standard dictionary descriptions of *intuition* indicate a process beyond rationale thought.

- **Conditional Environment.** Participant responses to the researcher interview would be influenced by historical and contemporary events in the participant's personal lived or vicarious experiences of decisionmaking.

- **Researcher Perspective.** Absolute negation of researcher perspective would not be achievable; however, a regular introspection and assessment by the researcher would minimize personal bias to the maximum qualitative extent possible.

- **Research Venue.** This research would be a qualitative exploration using a bounded case study.

- **Adult Education Meaning.** The research findings would not be appropriate for generalization.

Assumptions

The following assumptions framed this research. These assumptions supported a fundamental assumption stated by Merriam (1998): "One of the assumptions underlying qualitative research is that reality is holistic, multidimensional, and ever-changing; it is not a single, fixed, objective phenomenon waiting to be discovered, observed, and measured as in quantitative research" (p. 202).

Five philosophical vantage points assisted in shaping the foundational assumptions in this research. Creswell (1998) considered issues promoted by Guba and Lincoln (1988) of ontology, epistemology, axiology, methodology, and added his own assumption on rhetoric. Explaining these five terms in plain language set the stage for a challenging and exhilarating exploration. First but not necessarily primary among the assumptions, the ontological perspective assumed multiple realities existed, and used numerous quotes of the participants to express evidence in their "voices." Second, the

epistemological perspective sought to minimize the relational distance between the researcher and each participant. The former professional career as a U.S. Army officer was a substantial factor in establishing credibility with each participant and enhancing candid dialogue. Third, the axiological perspective acknowledged that values and biases existed in both the researcher and each participant. Openly discussing personal, cultural, and professional expectations encouraged candid verbal exchange between the researcher and each participant. Fourth, the methodological perspective demonstrated a contextual inductive approach to the research exploration. The process of qualitative research was clearly an emergent design that revised questions throughout the research, adapted to perceptions as expressed by each participant, and sustained a focus on the two research questions. Fifth, the researcher retained the language—formal, slang, or colloquial in nature—of each participant in their first-person descriptions of personal or vicarious experiences. The audio recording and transcription of what was said conveyed their vivid sensations in emotions, cognitions, and physical symptoms. Words have meaning, and this inductive process promoted the accurate interpretation of meaning as spoken by participants.

This perspective underpinned a key philosophical assumption in qualitative research that "reality is constructed by individuals interacting with their social worlds…[and] how they make sense of their world and experiences" (Merriam 1998, p. 6). In this qualitative research, the aim of better understanding the perception of intuitive decisionmaking was assumed to be:

- Enhanced by participants' personal or vicarious reflections of situational conditions in praxis.
- Influenced by individual participant self-efficacy, cultural values, and point in time.
- Appreciated more explicitly through interpretation of thick, rich personal narratives.
- Explored with participants who will contribute in a candid and truthful manner.

Definitions

Defining terms was inherent to establishing a common approach of exploring a case, phenomenon, and problem. Several terms that were essential to a uniform understanding of researcher interpretation of data in this research are as follows:

Adaptive decisionmaking. Adaptive decisionmaking is a dynamic process "to interpret the situation *while it is happening* [emphasis added] and choose from a number of possible actions" (Wlodkowski, 2008, p. 292).

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Art of command. The art of command is the "conscious exercise of authority to fulfill command responsibilities through understanding, visualizing, describing, directing, leading, and assessing operations….Commanders blend intuitive and analytic decisionmaking.". (*Mission Command*, 2011, pp. 3-1 and 3-3).

Case study. A case study is a readable, descriptive picture of or story about a person, program, organization, and so forth, making accessible to the reader all the information necessary to understand the case in all its uniqueness. The case study offers a holistic portrayal….and is context sensitive (Patton, 2002, pp. 447 and 450).

Creative thinking. Creative thinking involves something new or original. Creative thinking leads to new insights, novel approaches, fresh perspectives, and new ways of understanding and conceiving things…using adaptive approaches (drawing from previous similar circumstances) or innovative approaches (coming up with completely new ideas). In both instances, [Army] leaders use creative thinking to apply imagination and depart from the old way of doing things (*The Operations Process*, 2011, pp. 1-9 and 1-10).

Creativity. Creativity constitutes one of the highest forms of human expression. Innovativeness largely involves restructuring and synthesizing knowledge into new ways of thinking and doing things…[Self-efficacy in creativeness can] Override established ways of thinking that impede exploration of novel ideas and search for new knowledge (Bandura, 1997, p. 239).

Critical thinking. Critical thinking is purposeful and reflective and applies self-regulating judgment about what to believe or what to do in response to observations, experience, verbal or written expressions, or arguments. Critical thinking seeks to determine the meaning and significance of what is observed or expressed, and whether adequate justification exists to accept conclusions as true based on a given inference or argument (*The Operations Process,* 2011, p. 1-9).

Doctrine. "Doctrine is a guide to action, not hard and fast rules. Doctrine links theory, history, experimentation, and practice…It provides an authoritative statement on how the Army conducts operations…Doctrine provides the intellectual tools with which to diagnose unexpected requirements" (*The Army*, 2005, pp. 1-20 and 1-21).

Experience. Experience can be defined with multiple descriptions such as direct observation of or participation in events as a basis of knowledge; the fact or state of

having been affected by or gained knowledge through direct observation or participation; the practical knowledge, skill, or practice derived from direct observation of or participation in events or in a particular activity; the conscious events that make up an individual life or…the conscious past of a community or nation or humankind; something personally encountered, undergone, or lived through; or, the act or process of directly perceiving events or reality (In *Merriam-Webster Online Dictionary,* 2011).

Gestalten. The fundamental "formula" of Gestalt theory might be expressed in this way. There are *wholes*, the behavior of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the *intrinsic nature* of the whole. It is the hope of Gestalt theory to determine the nature of such wholes…Gestalt theory has to do with concrete research; it is not only an outcome but a device: not only a theory about results but a means toward further discoveries….The programme to treat the organism [man] as a part in a larger field necessitates the reformulation of the problem as to the relation between organism and environment. The stimulus-sensation connection must be replaced by a connection between alteration in the field conditions, the vital situation, and the total reaction of the organism by a change in its attitude, striving, and feeling (Wertheimer, 1924, Retrieved from http://gestalttheory.net/archive/wert1.html).

Hueristic. A heuristic is any systematic reasoning, exposition, or argument that juxtaposes opposed or contradictory ideas and usually seeks to resolve their conflict. A heuristic serves as an aid to learning, discovery, or problem-solving by experimental and especially trial-and-error methods. Heuristics also allow for self-educating techniques and informational feedback in order to improve performance (Hueristic. (n.d.), In *Merriam-Webster Online Dictionar*y. Retrieved from http://www.merriam-webster.com/dictionary/ heuristic).

Intelligence. "Intelligence is the purposive adaptation to and selection and adaptation of real-world environments relevant to one's life. Simply stated, it is mental self-management" (Sternberg, 1988, p. 72).

Intermediate Level Education (ILE). Intermediate Level Education is the U.S. Army's midcareer professional military education (PME) course provided by the Command and General Staff College in order "to prepare field grade officers with a warrior ethos and

warfighting focus, for leadership positions in Army, joint, multinational, and interagency organizations executing full spectrum operations….to develop operations career field officers with a warfighting focus for battalion and brigade command capable of conducting full spectrum operations in joint-multinational-interagency environments, and who have the requisite competencies to serve successfully" (*Intermediate Level Education,* 2011, Retrieved from https://cgsc2.leavenworth.army.mil/dsa/ile/mission.asp).

Intuitive decisionmaking. "Intuitive decision making is the act of reaching a conclusion which emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character" ([legacy] *Mission Command*, 2003, p. 2-4).

Intrinsic motivation. Intrinsic motivation "reflects the primary propensity of organisms to engage in activities that interest them and, in so doing, to learn, develop, and expand their capacities" (Ryan & Deci, 2000, p. 16).

Judgment. Judgment incorporates both quantitative (observation based) and qualitative (opinion based) indicators. Human judgment is integral to assessment. A key aspect of any assessment is the degree to which it relies upon human judgment and the degree to which it relies upon direct observation and mathematical rigor. Rigor offsets the inevitable bias, while human judgment focuses rigor and processes on intangibles that are often key to success. The appropriate balance depends on the situation (*The Operations Process*, 2011, p. 6-7).

Leadership. Leadership is the ability "to influence people–by providing purpose, direction, and motivation–while operating to accomplish the mission and improving the organization…is a lifelong process" (*The Army*, 2005, pp. 1-18 and 1-19).

Lifelong learning. Lifelong learning is a holistic decisionmaking process that includes intrinsic interest in a phenomenon, self-efficacy, adaptive behavior to conditions in a particular setting, and recurring personal evaluation (Bandura, 1997).

Metacognition. Metacognition is a cognitive appraisal and control of one's cognitive activity; that is, thinking about the adequacy of one's own thinking. In metacognitive functioning, individuals monitor their regulative thought; evaluate its adequacy in a solution to problems; and, if necessary, make corrective adjustments in a way in which they structure problems, construct solutions, and select strategies to implement them (Bandura, 1997, p. 230).

Military decisionmaking process. The military decision making process (MDMP) is an

iterative deliberate planning methodology that integrates the activities of the commander,

staff, subordinate headquarters, and other partners to understand the situation and

mission; develop and compare courses of action; decide on a course of action that best

accomplishes the mission; and produce an operation plan or order for execution (*The*

Operations Process, 2011, Appendix B-1).

Perception. Perception is the process of organizing and using information that is received

through the senses (Perception. (n.d.). In *Psychological Dictionary Online*. Retrieved from

http://www.all-about-psychology.com/psychology-dictionary.html)

Personal knowledge. Personal knowledge is an intellectual commitment….a fusion of the

personal [subjective] and the objective….Such knowing is indeed *objective* [emphasis added

by Polanyi] in the sense of establishing contact with a hidden reality; a contact that is defined as

the condition for anticipating an indeterminate range of yet unknown (and perhaps

inconceivable) true implications" (Polanyi, 1964, pp. xiii and xiv).

Phenomenon. Phenomenon is "anything that can be perceived as an occurrence or fact by

the senses; any remarkable occurrence or person" (Phenomenon. (n.d.). In *Collins English*

Dictionary: Complete and Unabridged. Retrieved from http://dictionary.reverso.net/english-

definition/phenomenon/).

Self-efficacy. "Perceived self-efficacy refers to beliefs in one's capabilities to organize

and execute the course of action required to produce given attainments…In given domains of

functioning, efficacy beliefs vary in level [of challenge or impediment], strength [in personal

judgment of capability and intention], and [situational conditions or] generality" (Bandura, 1997,

pp. 3, 21-22, and 42-43).

Tacit. Tacit means "expressed or carried on without words or speech; implied or

indicated (as by an act or by silence) but not actually expressed" (Tacit. (n.d.). In *Merriam-*

Webster Online Dictionary. Retrieved from http://www.merriam-webster.com/ dictionary/tacit).

Tacit knowing. Tacit knowing is more fundamental than explicit knowing: we can know

more than we can tell and we can tell nothing without relying on our awareness of things

we may not be able to tell…all thought contains components of which we are subsidiarily

aware in the focal content of our thinking, and that all thought dwells in its subsidiaries,

as if they were parts of our bodies. Tacit knowing is a "from-to" conceptual construct that

"in an act of tacit knowing we *attend from* [emphasis added by Polanyi] something for attending *to* [emphasis added by Polanyi] something else (Polanyi, 1964, p. x; Polanyi, 1966, p. 10).

Understanding. Understanding is the knowledge gained from the process of coming to know or understand something; the capacity to apprehend general relations of particulars; the power to make experience intelligible by applying concepts and categories and to form an opinion or reach a conclusion through reasoning and information (Understanding. (n.d.). In *Merriam-Webster Online Dictionary*. Retrieved from http://www.merriam-webster.com/dictionary/understanding).

Human Rights and Ethical Safeguards

This research was conducted in compliance with Kansas State University (KSU) policy for research with human subjects. The Committee on Research Involving Human Subjects and Institutional Review Board (IRB) administered this program in accordance with *Kansas State University Committee for Research Involving Human Subjects Institutional Review Board (IRB)* (2010).

Due to participants being students at the U.S. Army Command and General Staff College (CGSC), this research was compliant with U.S. Army Command and General Staff College requirements for research with human subjects. The Quality Assurance Office (QAO) of CGSC implemented U.S. Department of Defense regulations and instructions, and Army regulations as directed in CGSC Bulletin No. 40, *Research within the CGSC* (2010).

Significance of The Study

The significance of this study spotlighted a critical requirement for continued qualitative research on the phenomenon of intuitive decisionmaking. The critical significance of the study was magnified during semi-structured interviews with a ten-participant purposeful sample of U.S. Armed Forces officers.

First, in the quest to better understand the nature of intuitive decisionmaking in the real world life experiences of the participants, the study revealed a key gap in Army doctrine. In October 2011, the term *intuitive decisionmaking* was rescinded from Army doctrine. The Army had traditionally stated that there were two ways to make decisions: analytic and intuitive.

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Intuition was described simply as immediate understanding for decision and action. However, intuition was ill-defined as a cognitive process when compared and contrasted to the Army's deliberate-analytical model. The study suggested that Army doctrine was inadequate to effectively describe the process of intuitive decisionmaking.

Next, the relevant adult education literature continued to discuss the possible or probable cognitive processes that occur in an individual to allow intuition to emerge as conscious thought. However, the concept of intuition was generally defined as direct knowledge or cognition without evident rational thought. Whether philosophical, psychological, or neuro-scientific in nature, the process of how intuition occurs remained an enigma. The study indicated that additional experimentation and exploration of intuition by the physical and social sciences were necessary.

Third, as a case study, no generalizations to a population were expected or stated in this study. Nevertheless, the recollections, insights, and expressed feelings of a ten participant purposeful sample suggested that a gap existed in their professional military education of *what* intuition is and *how* intuition functions in making an immediate decision. Several of the participants performed admirably in crisis situations; that was not the issue. The study indicated that the Army's professional military education system required a more informative discussion on the *art* and science of intuitive decisionmaking as a complement to the Army's analytical decisionmaking model.

Finally, participants in this study indicated the significant and positive impact of *self-efficacy* on their decisionmaking. The essence of intuitive decisionmaking appeared to be implicit. However, through their telling of personal or vicarious experiences, a more explicit description emerged on their personal perception of intuition in military decisionmaking. They seemed to gain an improved appreciation of their critical and creative thinking skills to make sense of complex, dynamic, and uncertain conditions. The participants indicated that intuitive decisionmaking was an essential competency as a leader.

Summary

This exploration of intuitive decisionmaking indicated that a small purposeful sample of commissioned officers of the U.S. Armed Forces required an improved understanding of intuitive decisionmaking. A review of Army literature identified that the *art* of applying intuitive

decisionmaking had received minimal emphasis in Army doctrine. In October 2011, the ability to understand and use intuitive decisionmaking effectively was further diminished when the term *intuitive decisionmaking* was rescinded from Army doctrine.

This study's quest was to better understand the nature of intuitive decisionmaking in the real world experiences of the ten participants. Each commissioned officer had a unique ability to verbally articulate his sensations, thoughts, and personal images of intuition. Nonetheless, when participants described tangible conditions in particular contexts, they acknowledged the presence of compelling yet impalpable stimuli. These participants' responses suggested that the doctrinal gap limited an effective use of intuition and *decisive action* in moments of complex crisis.

Polanyi's (1958) famous quote, "We can know more than we can tell" concluded with a statement that "we can tell nothing without relying on our awareness of things we may not be able to tell" (p. x). This supposition illustrated a contextual richness that emerged from Polanyi's theory of personal knowledge. He claimed that "we keep modifying, subsidiarily, our interpretation of sensory clues by striving for clear and coherent perceptions, or enlarging our skill without focally knowing how by practicing them in ever new situations" (p. 112). Thus, a quest to understand intuition and the decisions that can result may require: (1) intrapersonal analysis of what "we *can* [emphasis added] tell" through explicit intellectual focus; (2) practical analysis of contextual conditions in focused praxis as promoted by Wertheimer (1945); and (3) rigorous self reflection-*in*-action and reflection-*on*-action (Schön, 1987). These perspectives, combined with passionate aspiration to discern perception into understanding, proposed an improved personal and professional self-efficacy in making intuitive decisions (Bandura, 1997).

This research enhanced learning how to accept or question intuition when situational conditions require immediate decision and action. This research augmented professional literature on the *art* of military leadership and leader development in the second decade of the 21st century. Similarly, adult education literature and the body of knowledge obtained qualitative insight from the perspectives of a ten-participant purposeful sample and researcher on the presence and value of making intuitive decisions in crisis. This research identified recommendations for continued exploration and study on the phenomenon of *intuitive* decisionmaking.

Chapter 2 - Review of the Literature

Introduction

This chapter reviewed relevant literature on the phenomenon of intuitive decisionmaking integral to adult learning and the participants of this research study. Merriam and Brockett (1997) spotlighted the importance of appreciating a professional literature base with its provisions of historical perspective, speculative viewpoints, and continuous update of professional thought, theory, and knowledge.

To shape this specific avenue of qualitative inquiry, four topical areas surveyed in relevant professional literature were as follows: (1) modern psychological exploration of "thinking about thinking" with particular attention to gestalt psychology as developed by Wertheimer (1913, 1945); (2) modern philosophical underpinnings on intuition and a theory of implicit knowing promoted by Michael Polanyi (1958, 1964, 1966); (3) recent professional assessments of intuition and decisionmaking in social science praxis (Schön, 1987; Sternberg, 1988; van Manen, 1990; Klein, 1998, 2003; Hedlund, Williams, Horvath, Forsythe, & Snook, 1999; Hogarth, 2001; Cianciolo, et al., 2001; Myers, 2002; Goldberg, 2005; Creswell, 2008; Day, Harrison & Halpin, 2009; Fisher, et al., 2009; and Kahneman & Klein, 2009; Betsch, C., 2010; Glöckner & Witteman, 2010; Kahneman, 2011); and, (4) principles of contemporary U.S. Army research and doctrine (U.S. Department of the Army, 2003, 2006, 2010, 2011) used to explain and professionally educate effective intuitive decisionmaking.

Defining intuition in decisionmaking has been open to controversy given the many perspectives of contemporary research and study on the phenomenon. Nonetheless, "most definitions agree that intuition is based on automatic processes which rely on knowledge structures that are acquired by different kinds of learning. They operate at least partially without people's awareness and results in feelings, signals, and interpretation" (Glöckner & Witteman, 2010, p. 3).

Gestalt Expression and Intuition

To Think about Thinking

Formative scientific studies and theorizing of gestalt psychology in the early to mid 20th century was heavily influenced by the contemporary research of Max Wertheimer. His book *Productive Thinking* (1945) emphasized the requirement for deep, rich thinking to effectively understand the environment that we live in. Wertheimer described a deep understanding beyond a simple stimulus and effect. His desired result was to reach perceptively beyond a mere scientific rationale. He firmly believed that study of gestalt psychology was holistic. He sought to understand the relationships among and encompassing discrete elements of an entity−a phenomenon−and the summative *whole* of that environment. Even more important, he wanted to understand the integrated *effects* of an integrated [holistic] environment which was more than the sum of its constituent parts. The experiments with stroboscopic effect that were regularly associated with him were merely a means to this psychological end.

For Wertheimer, effectively perceiving the integrated relationships of an entity would lead to clear comprehension and illumination of an entirely new understanding of interrelated meanings. This understanding appreciated inductive and deductive analyses of *how* a particular phenomenon occurred. His concurrent and inseparable appreciation was the impact that the "whole" had on discrete elements that emerge among a particular constellation of stimuli in a phenomenon. He focused his attention on the *integrated* meaning, elements, and summative purpose of a phenomenon.

Wertheimer's Emergent Gestalt on Thinking

Max Wertheimer, the psychologist most often associated with the modern term of gestalt, was credited by colleagues such as Koffka (1935) and Köhler (1947) as the "father" of gestalt psychology. In 1924, Wertheimer described his concept of gestalt in a psychological society address titled, "On Gestalt Theory." He stated, "the fundamental 'formula' of gestalt theory might be expressed in this way. There are *wholes*, the behavior of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the *whole* [emphasis added]."

Gestalt was "founded on the position that the whole is entirely *different* [emphasis added by King and Wertheimer] from a sum of the parts, indeed is *prior to* [emphasis added by King and Wertheimer] the parts; wholes are integrated, segregated systems that have an inherent structure of their own, and the structure of the whole in fact determines the nature of the parts" (King & Wertheimer, 2005, p. 97). The integrated structures or systems were in dynamic interrelation with its constituent parts *and* with the whole.

As early as 1905, Wertheimer contemplated the essential issue of this whole-part relationship in personal notes and professional correspondence. Wertheimer posed a belief that something new must emerge from a comprehensive relationship of a *gesamtgebilde,* that is, a *joint form* and its significantly different meaning from a mere entity comprised of constituent parts (King & Wertheimer, 2005, pp. 73-74).

Koffka accented the importance of this context and being as, "The whole is more than the sum of its parts. It is more correct to say that the *whole* is something else than the sum of its parts, because summing up is a meaningless procedure, whereas the *whole-part* relationship is meaningful" (1935, p. 176). Koffka attributed an additional description to Wertheimer as "parts are coordinated in a hierarchical system around a central point. Such structures [*Gestalten*] are in no way less immediate that their parts; indeed one often comprehends a whole before anything regarding its parts is apprehended" (King & Wertheimer, 2005, p. 54).

Köhler (1947) complemented Wertheimer's definition of gestalt and emphasized understanding gestalt as much more than shape or form. Gestalt is about "facts of organization, and thus to the problem of specific entities in sensory fields….The word refers to a specific object and to organization" (King & Wertheimer, 2005, pp. 177-178). Köhler added that "the processes of learning, of recall, of striving, of emotional attitude, of *thinking*, *acting*, [emphasis added] and so forth, may have to be included" (p. 179).

A visualization of the integrated relationships and how a gestalt may appear or be thought of were complex and difficult to simplify (See Figure 2.1.). A gestalt may, and probably would, have a distinctly different meaning from what is initially apprehended. For example, an initial image of a singular smooth-surfaced shape may actually be configured from a grouping of hexagon-like shapes with distinct relationship to entities directly adjacent to each other and within a larger summation of form. An original apprehension, interpreted as a comprehension, may in fact not be an accurate image of reality.

Figure 2.1 A Visualization of Gestalt Perception
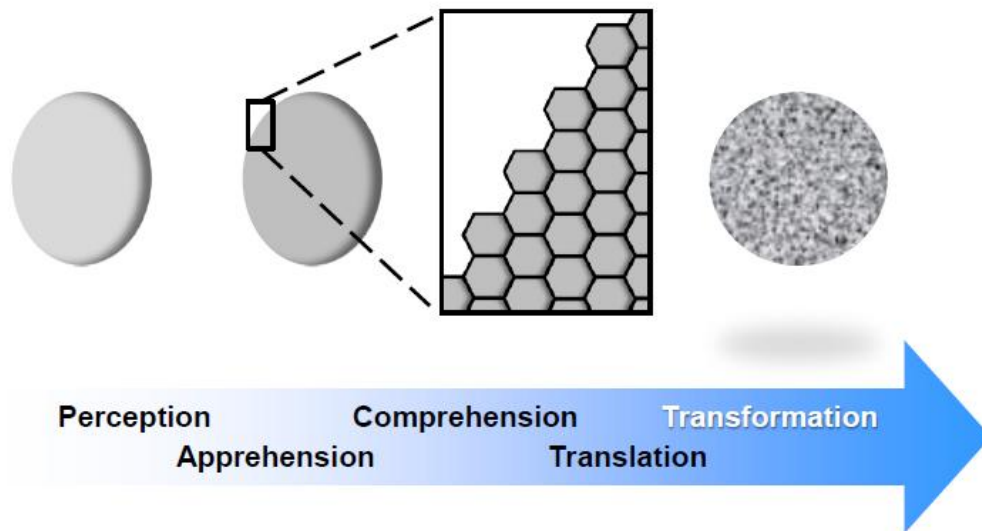
Figure 2.1. Visualization of gestalt as a concept of perceiving interrelationships with a particular context and subsequently knowing new meaning. This example sequences from a simple geometric illustration of whole, to a discerning of parts comprising the whole, and then, a holistic appreciation and understanding of the whole to components, within a context, in order to realize a new meaningful *joint* configuration.

In Figure 2.1., the composition of whole was understood as a completely different interrelationship of parts and whole. The *joint form* was visualized with multiple spatial and meaningful relationships, and results in a new configuration being recognized as circular rather than oblong in shape.   This fundamental principle can be exemplified in natural camouflage as a means to protect a creature from a predator. Many forms of wildlife have color or tonal qualities that provide a natural disguise. The white spotted brown fur of a fawn looks like speckles of light that penetrate a canopy of trees to the shaded forest undergrowth. The mottled browns and blacks of a partridge's feathers mask it in the tangled brush and grasses of a hedgerow. Upon closer inspection, the discrete aspect of perceiving and then recognizing a young deer or wild fowl emerged from an environmental condition−a joint form−that moments earlier was a totally different stimulus to the senses.

Examples of such natural camouflage used visual subterfuge for concealment and disguise. Camouflage was a general resemblance as in blending into colors or structure-form of

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an immediate environment, or can be of a special resemblance as in mimicking another object completely within an immediate environment such as an insect with the characteristics of a leaf or a stick (Newark, 2007, pp. 13-14). This cryptic effect may be a useful comparison when describing the *whole-part* relationship of gestalten. Camouflage, a concept familiar to participants in the purposeful sample, acquired new meaning when particular cues or clues emerged as an instant recognition of an entity within an environment. Moments earlier, that entity had remained unrecognized.

Critical thinking analyzed believed-to-be facts and verified knowledge, while creative thought postures possible and even improbable alternatives to meaning. This dynamic relationship of *thinking about thinking*−thinking critically and creatively−was sometimes revealed as an epiphany. A completely new meaning transformed an initial perception into a more comprehensive understanding of a phenomenon.

Productive Thinking and Perception

Wertheimer's scientific perspective on thinking about thinking was often understood as investigation focused on perception of apparent physical movement. It was not. His experiments were a means to investigate a phenomenon. He explored perception, and acquired a refined meaning of gestalten with critical and creative thinking. Notwithstanding, Wertheimer (1945) desired rigorous scientific research without a limiting empirical reductionist outcome. He concentrated on the human dimension of thinking.

Asch (1980), asked to provide a testimonial in honor of Wertheimer, reflected on Wertheimer's interest in thinking clearly. "For him thinking was inseparable from striving and feeling. With the capacity to perceive and think goes the need to perceive clearly and the need to understand." Asch emphasized that, "Underlying this basic orientation of Wertheimer's was a vivid sense of what it is to an organism sensitive to the forces of its environment" (King & Wertheimer, 2005, pp. 9-10).

Koffka (1935) commented on Wertheimer's solution to a dilemma of psychology when using principles of empirical science and an aesthetic sense of meaning: "To explain and to understand are not different forms of dealing with knowledge but fundamentally identical. And that means: a causal connection is not a mere factual sequence to be memorized…but is intelligible" (pp. 531-585). Wertheimer sought to display this phenomenological understanding

of what and how something occurred when gestalten, or *meaningful configurations*, are apprehended and then comprehended in a specific environment.

Wertheimer used several principles to describe gestalten. Although these concepts were sometimes referred to as laws, the concepts were more correctly categorized as something less than a law or unequivocal in truth. These principles presented his approach on an apparent insight beyond perception. Understanding gestalten depended on individual acuity, and was not necessarily a universal recognition skill among individuals. King and Wertheimer (2005) summarized the concise organizational characteristics of gestalt principles (pp.155-156):

- Principle of *Prägnanz*. This principle is the overarching concept of "a tendency for the organization of any whole or gestalt to be as good as the prevailing conditions allow."
- Principle of "Proximity or Nearness." This principle asserts that perception will tend to group items together based on their proximity to each other.
- Principle of "Similarity." Here, the elements of color, shape, or texture tend to be perceived as a group based on similarity of the particular element.
- Principle of "Good Continuation." This principle states that items appearing in a consistent direction tend to be perceived as connected or having continuity.
- Principle of "Closure." A grouping of items will tend to be perceived as either being complete or an incomplete part of a whole to become an understandable whole in its configuration.

Köhler (1959), presenting to the American Psychological Association, described Wertheimer's subjective appreciation of "apparent movements." Köhler stated that if an individual perceives motion where no motion actually exists, as in a stroboscopic effect, "the apparent movement confirmed Wertheimer's more general suspicion: we cannot assume that the *perceptual* scene is an aggregate of unrelated elements because underlying processes are already functionally interrelated when that scene emerges, and now exhibits corresponding effects" (para. 4).

In their earlier cooperative research, Köhler (1920) had collaborated on Wertheimer's concept that the *whole*, as experienced, had a significant role beyond just physical moment, sequence, and connection. The concept of *prägnanz* demonstrated how individuals think and learn beyond a reductionist calculation of piece-parts or summation, and that meanings reside within, and emerge from, a particular context for expanded comprehension.

In his theory of productive thinking, Wertheimer addressed learning that results from requestioning and discerning the sense-making triggered by a phenomenon. King and Wertheimer (2005) referenced Wertheimer's *Productive Thinking* (1945) on apprehending a phenomenon. Wertheimer (1945) said:

A certain region in the field becomes crucial, is *focused* [emphasis added]; but it does not become isolated. A *new, deeper structural view* [emphasis added] of the situation develops, involving changes in the functional meaning, the grouping, etc., of the items. Directed by what is required by the structure of a situation for the crucial region, one is led to a reasonable prediction, which–like the other parts of the structure–calls for verification, direct or indirect. Two directions are involved: getting a whole consistent picture, and seeing what the structure of the whole *requires* of its parts (p. 212).

Nonetheless, these principles received challenges as critical review attempted to refine an understanding of perception and gestalt. Vicario (1998), having demonstrated challenges to the implied unification in Wertheimer's use of terms such as factors or principles, preferred to use *principles of description* [emphasis added by Vicario] as a more effective definition (p.268). He proposed that as psychological research continues to study gestalt phenomena, this description may entice critical and creative thinking on what occurs in sublime hidden cognition and what causes an insight or the knowledge to appear.

This constant comparison of holistic assessment and detailed examination of a phenomenon created a compelling pressure to think critically and creatively about regions of thought that may remain obscured in a strict analytical approach to discovery. A key principle of Wertheimer's productive thinking was to seek meaning beyond just empirical trial and structural understanding. One of his examples was a study of melodies because in "musical grasping the issues are vividly felt" (Wertheimer, 1945, pp. 245 and 255). Exploration required a perceptive metacognition of what is occurring at a particular time and place. Wertheimer (1945) acknowledged *artistic appreciation* as a means to discern hidden meanings of a gestalt.

Psychologist Michael Wertheimer (1997) summarized a contemporary perspective of his father's [Max Wertheimer] productive thinking with a contrast of reproductive thinking "which can be accounted for reasonably well by the associationist paradigm" to productive thinking as "insight-based reasoning" and "going from a state of confusion about some issue that is blind to

the core structural features and properties of that issue, to a new state in which….is clear, makes sense, and fits together" (Wertheimer, para. 3 and 16).

Gestalt experimentation on insight and sense-making inspired other related forms of social science exploration. For example, Polanyi acknowledged that "it is the mechanisms underlying the formation of gestalt, that I first derived my conception of tacit knowing in personal knowledge" (1966, p. 95). Yet, Polanyi stated that his theory of personal knowledge was "so different from that of gestalt psychology" (1958, p.55) and its empirical focus. Scientific detachment in inquiry was only part of the quest. Mitchell (2006) cited Eric Voegelin in a comparison of Polanyi's thinking: "The human situation is inevitably one of participation" (p. 153). Polanyi spotlighted a crucial element of *knowing* as a personal and responsible act, both physical and mental, to perceive a meaning in context as "a place that has particular physical characteristics, a particular culture, a particular language, and particular habits, customs, and mores" (p. 168). Social context and a keen interest in humanity led Polanyi to his philosophical exploration of knowledge beyond an isolated empirical explanation.

Polanyi and Tacit Knowing

Michael Polanyi (1958) was a modern philosophical entry point to understanding intuition. He professed a thoughtful approach to knowing with constructivist and humanistic perspectives on an individual's ability to shape and improve a better lifelong learning world. In *Personal Knowledge* (1958) in a section titled "The Educated Mind," he said, "Thus our sense of possessing intellectual control over a range of things, always combines an anticipation of meeting certain things of this kind which will be novel in some unspecifiable respects, with a reliance on ourselves to interpret them successfully by appropriately modifying our framework of anticipations" (p. 103).

A Philosophical Entry Point: Polanyi

Evolving from over four decades of research and reflection, Polanyi stated his beliefs in a theory of personal knowledge, tacit knowing, and intuition (1958, 1964, 1966). His theory provided an overarching philosophical context to the research of this dissertation on intuitive decisionmaking. His seminal concept of tacit knowing expressed his perspective of intuition in pursuit of discovery. Mitchell (2006) likened Polanyi's passion for tacit discovery as aesthetic

appreciation and practical knowledge as "when a puzzle piece makes a picture come into view or a turn of a key brings a lock's tumblers into place" (p. 167). Polanyi's (1958) philosophical approach, grounded in his extensive scientific experience, labeled personal knowledge as a knowing that cannot be entirely explicit. He posed a form of knowledge−*tacit*−that is more fundamental than a clearly quantifiable and explainable knowing.

Trained and acclaimed as a scientist in the early twentieth century [Albert Einstein complimented Polanyi's research (1913-1914) in chemistry and thermodynamics (Mitchell, 2005, p. 4)], Polanyi developed his philosophy of tacit knowing by first "rejecting the ideal of scientific detachment" (Polanyi, 1958, p. xiii). Polanyi progressed from a professional perspective of pure analytical investigation to a set of philosophic principles grounded in science and *art*.

These principles merged the magnificent and implicit capacity of the human mind in a pursuit of knowledge "that is determined at every stage [of inquiry] by undefinable powers of thought" in a search for discovery (Polanyi, 1964, p. ix). Tacit knowing, according to Polanyi, was "the adaptation of our conceptions…to new things that we identify as variants of known kinds of things [and] is achieved subsidiarily, while our attention is focused on making sense of a situation in front of us" (Polanyi, 1958, p. 112).

Polanyi stated there were two kinds of awareness to personal knowledge: *subsidiary* awareness and *focal* awareness. A key distinction was "subsidiary awareness and focal awareness are mutually exclusive" (Polanyi, 1958, p. 56). He related a harmony of focal awareness to explicit knowledge, whereas tacit knowing resides in implicit, subsidiary awareness (Polanyi, 1964). These two intimate concepts of his theory displayed a philosophic foundation of how to perceive and understand tacit knowledge and the personal ability to be intuitive in making decisions.

The Value of Subsidiary Particulars

In *The Tacit Dimension* (1966), Polanyi explained that tacit knowing "shows that all thought contains components of which we are subsidiarily aware in the focal content of our thinking, and that all thought dwells in its subsidiaries…[thinking] has a *from-to* [emphasis added by Polanyi] structure" (p. x). Polanyi based his theory of personal knowledge on "things of which we are focally aware can be explicitly identified; but no knowledge can be made wholly explicit" (1964, p. x) (See Figure 2.2.).

Polanyi's example of driving a nail into wood with a hammer illustrated how both focal awareness and subsidiary awareness function. They complemented each other in a *from-to* [emphasis added] relationship. Focal attention on the nail head, as the nail is held between thumb and finger against a board, was the object of focal attention. The feeling of a hammer in hand, swing and arc, and velocity and contact of the hammer to the nail were "instruments" of that awareness that "are not watched in themselves; we watch something else while keeping intensely aware of them. I have a *subsidiary awareness* [emphasis added by Polanyi] of the feeling in the palm of my hand which is merged into my *focal awareness* [emphasis added by Polanyi] of my driving the nail" (1958, p. 55).

Figure 2.2 Visualizing Subsidiary Particulars and Focal Awareness Context
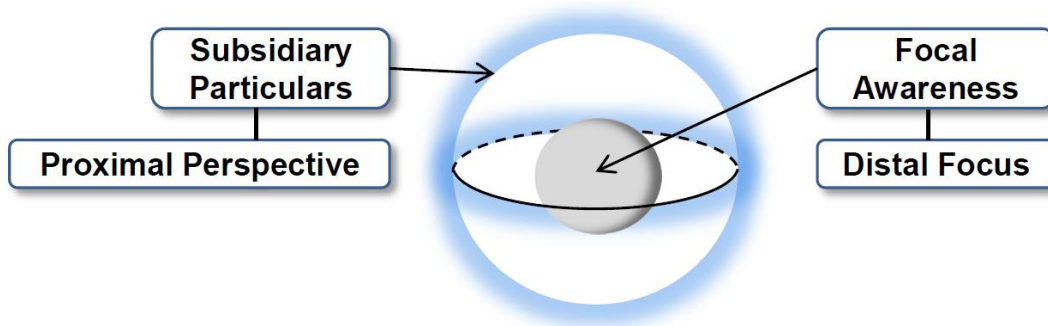
Figure 2.2. Visualization of subsidiary particulars to indicate the context of attending to a focal point of awareness. According to Polanyi, these supporting roles exclusive from the focal entity, were simultaneously integral to the mutually compatible configuration that comprises the pattern-like meaning. Given that *distal* is a specific distant point *to* [emphasis added] which an individual is attending, the *proximal* is an encompassing environmental point *from* [emphasis added] which an individual perceives a domain of numerous practical and subsidiary signals. This collective provides coherence to an immediate focused, distal experience. Adapted from *Personal Knowledge* by Polanyi (1958).

Polanyi made another distinctive point that all particulars become meaningless if we lose sight of the pattern which they jointly constitute. They must be "apprehended jointly" (Polanyi, 1966, p. 57). Using the example of nail and hammer again, visualization of a hammer in a hand striking a nail illustrated the focal attention of a joint configuration; however, if the feeling of the hammer in hand becomes the focal awareness, the individual no longer retained the coherence of

the former action in progress and endangered hitting the finger or thumb with the hammer, rather than hitting the nail.

Polanyi emphasized the value of such *hidden realities*. Learning this value was progressive. He stated, "Any tradition fostering the progress of thought must have this intention: to teach its current ideas as stages leading on to unknown truths which, when discovered, might dissent from the very teachings which engendered them" (1966, p. 82). His statement sounded philosophic, yet it suggested a practical aspect of learning skill. Polanyi believed strongly in the gradual development of expertise. He described this as "connoisseurship" where a novice "must go through a long course of experience under the guidance of a master" (p. 54). He stated that much learning was ongoing subsidiarily while a participant is making sense of an explicit situation. This learning was modifying "interpretation of sensory clues by striving for clear and coherent perceptions, or enlarging our skill without focally knowing how by practicing them in ever new situations" (p. 112).

Patterns emerged. Polanyi noted the unidentifiable particulars of a gestalt as "clues or tools…used as such and not observed in themselves" (1964, p. xiii), and that "perception is a comprehension of clues in terms of a whole" (1958, p. 97). This dilemma was a situation of "being 'subsidiarily aware' of these particulars within our 'focal awareness' of the coherent entity that we achieve" (1964, p. xiii). Polanyi stated another example "when the eye divides the field of vision into 'figure' and 'background,' it [thinking] prepares to see the figure retain its identity" (1958, p. 38). This pattern-making differentiated what had been apparent random or unordered elements. An order and value were established from cues that made sense to the participant.

Polanyi acknowledged gestalt as "…the outcome of an active shaping of experience performed in the pursuit of knowledge" (1966, p. 6) with a mutually supporting scientific and philosophic outlook. He used terms of integrating and shaping interchangeably, and centered his theory on the integration of the unidentifiable particulars surrounding a known object of attention. Furthermore, Polanyi stated:

> This sharing or integrating I hold to be the great and indispensable tacit power by which
> all knowledge is discovered and, once discovered, is then recast into logic of tacit
> thought, and this changes the range and perspective of the whole subject. The highest

forms of integration loom largest now. These are manifested in the tacit power of scientific and artistic genius (1966, p. 6).

The Focal and Proximal Synergy

Polanyi used a metaphor relationship for *proximal* and *distal* to illustrate the function of subsidiary and focal awareness of tacit knowing in the *from-to* relationship. First, he noted that "in an act of tacit knowing we *attend from* [emphasis added by Polanyi] something for attending *to* [emphasis added by Polanyi] something else" (1966, p. 10). Polanyi used an anatomical context of *proximal* and *distal* to illustrate this functional relationship. Proximal was more than a near-point of reference; proximal included the environment that encompassed a distal point of attention. The proximal "includes the [implicit or subsidiary] particulars, and the distal…is the comprehensive meaning" (p.34). In this case, the proximal may be "the knowledge that we may not be able to tell" (p.10). Polanyi theorized that we attend from the proximal toward the distal as a functional structuring of *context* in order to determine meaning. A simple example of this relationship is camouflage and the moment of perception followed by recognition when the true object is known.

Next, Polanyi described a phenomenal structure of tacit knowing. "In the appearance of a distal entity [meaning], we are aware of that *from* [emphasis added by Polanyi] which we are attending *to* [emphasis added by Polanyi] another thing, in the appearance of that thing" (1966, p. 11). This "from-to" change in perception was an awareness of something different from what had been recognized previously and indicated new perspective and refined meaning. As such, a third relationship was semantic where meaning emerged from an environment at a specific place and time. Perceiving those conditions occurred from a particular vantage point at that place and time. Fourth, he supported an ontological perspective in the meaningful relationship of "understanding of the comprehensive.…Thus the proximal term represents the *particulars* [emphasis added by Polanyi] of this entity…for attending to their joint meaning" (p. 13).

Understanding how this joint configuration makes sense to an individual was tacit knowing. In *Personal Knowledge* (1958), Polanyi related tacit knowing to the moment of illumination in an act of discovery. The concept of camouflage conveyed a simple example of hidden meaning illuminated suddenly by tacit knowing. The tacit aspect could remain tacit or acquire recognition as explicit knowledge.

Polanyi illustrated this concept with Poincaré's four stages of discovery: preparation, incubation, illumination, and verification (Poincaré, 1908/1913). Often, a period of preparation was overt and explicit. Sometimes this preparation phase merged with incubation as thinking that was implicit, apparently forgotten, or not conscious to a participant. And then, an epiphany suddenly emerged–illumination–a tacit knowing became coherent (See Figure 2.3.).

Polanyi indicated discovery [meaning] was the moment of illumination (Mitchell, 2006). Verification was a period of effort to confirm what a participant knows. The Poincaré model was not a wholly logical process. The concept of problem solving included problem elements of a "logical gap" and risk taking. Mitchell (2006) cited Polanyi that known data were the "clues to the unknown; as pointers to it and parts of it" (p. 81). Yet, "the interpretive framework of the educated mind is ever ready to meet somewhat novel experiences, and to deal with them in a somewhat novel manner" (Polanyi, 1958, p. 124). Polanyi suggested that "the practice of skills is inventive" (p. 128) and that a passionate approach to trying out possible ideas and solutions was in the realm of explicit trial and proof. However, during a stage of incubation, whether emergent or unconscious, "the intuitive powers of the investigator are always dominant and decisive" (p. 130).

Figure 2.3 The Moment of Illumination in the Poincaré Model of Discovery
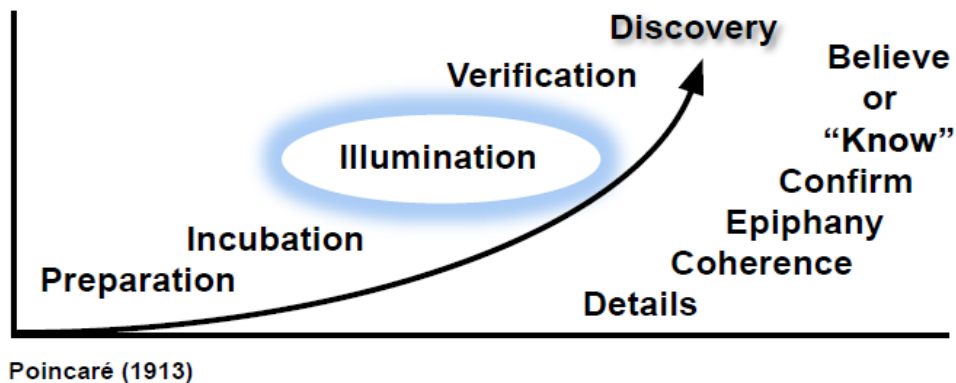
Figure 2.3. Poincaré model of discovery to exemplify the moment of illumination, that is, the epiphany or intuition that revealed solution to a dilemma. Polanyi (1958) believed tacit knowing was a process-*in*-action and unknown to the individual. An individual incubated cognitive and somatic stimuli, often implicit rather than rational in thought, of a particular physical setting or a cognitive condition. Meaning, recognized at a rational level of consciousness, could emerge as an epiphany–a sudden and illuminating perception. Understanding could follow. Adapted and applied model of discovery from *The Foundations of Science* (Poincaré, 1908/1913).

Polanyi's understanding of tacit knowing was not mystical. According to Polanyi (1958), "it depends on natural ability, fostered by training and guided by intellectual effort. It is akin to artistic achievement and like it is unspecifiable, but far from accidental or arbitrary" (p. 106). He opened a valid avenue of inquiry by knowing there is much we cannot tell or understand, and that the future holds an "indeterminate range of unsuspected results" (1966, p. 61).

The bi-directional relationship of Polanyi's focal and subsidiary awareness was a way to envision the environment of intuitive decision. However, another illustration of context included a three domain approach in order to improve appreciation of tacit knowing. Arvidson (1997) cited field of consciousness research by Gurwitsch (1964, 1966), and visualized three domains of awareness linked to attention: theme, thematic-field, and margin. *Theme* was a construct for the focus of attention and centers a field of awareness. This concept equated to Polanyi's concept of *distal* to indicate a point of focal conscious awareness.

Arvidson (1997) used a different approach of "singling out" an issue and "synthesis" of intuition as a "sudden reorganization of the field of consciousness…in which the previous theme is replaced with a new theme. The dynamic ability to sense new meaning through synthesis is the rapid emergence and momentary stabilization of thematic consciousness…the transformation of what was previously presented as thematic into a constituent of the new theme" (p. 49). He described this perception as a moment of crystal clarity and *wholeness*.

The thematic field that Arvidson proposed was the *relevant* [emphasis added] context or background which provided cues or insight to a focal point or idea of attention. Arvidson noted that "the most relevant thematic-field items are presented as (perceptually, but not necessarily physically) close to the theme" (p. 45).

An illustration of concentric spheres suggested a similar field of subsidiary particulars and tacit knowing in Polanyi's theory of personal knowledge. A larger domain encompassing a thematic-field, according to Arvidson, was "margin." He described margin as the least important dimension specific to a theme of immediate focal attention. This third domain presented a concept of sensing implicit cues among subsidiary particulars which are or are not relevant to a specific theme. The three domains were present concurrently with outermost or marginal items "otherwise not relevant to the presented possible lines of context or relevance dictated by the theme" (p. 45) (See Figure 2.4.).

Figure 2.4 Visualizing Subsidiary Particulars in Thematic Field for Intuition
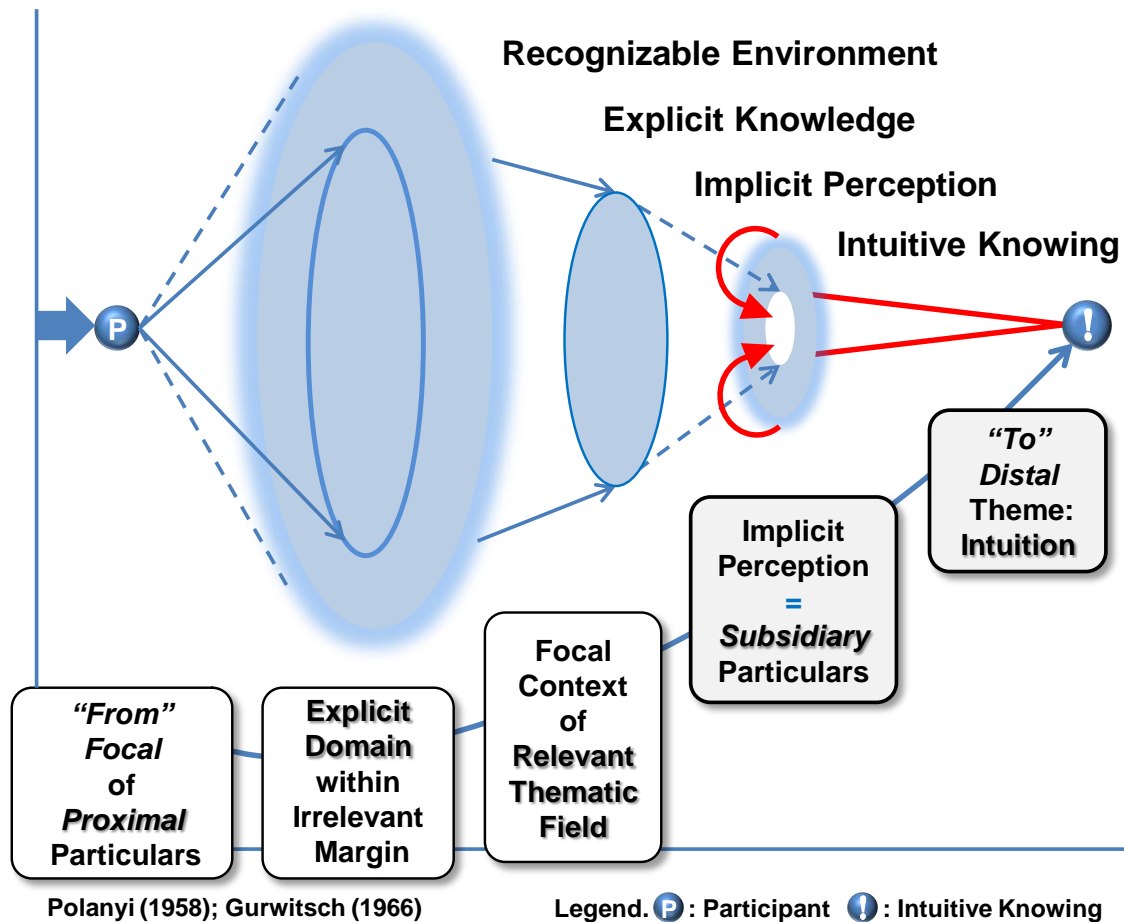
Figure 2.4. Visualizing Polanyi's tacit knowing as integral to the intuitive comprehension of a focal entity or action. Polanyi moved from a proximal presence to a distal focus point. Gurwitsch's model facilitated understanding Polanyi's intuitive knowing by transiting explicit general awareness to a relevant thematic field. In the model, stimuli marginal to the thematic field was ignored. Implicit awareness of "subsidiary particulars" that encompass a distal point of attention prompted tacit perception and intuitive understanding. Polanyi's premise "that we can know more than we can tell" suggested the instantaneous, *intuitive knowing* how to act in a specific condition. As adapted and applied from Polanyi (1958) and Gurwitsch (1966).

Recognizing which cues were significant was learning through experience and reflection on perceptions that lead to a decision to act. Perception was a personal experience, and as such, "perception is not a science of the world, it is not even an act, a deliberate taking up of a

position; it is the background from which all acts stand out, and is presupposed by them" (Merleau-Ponty, 1945/1962, p. xi). He added to his existential viewpoint: "There are truths just as there are perceptions: not that we can ever array before ourselves in their entirety the reasons for any assertion" (p. 459), and, "the consistency of a thing perceived, of a geometrical relationship or of an idea, is arrived at only that I give up trying by every means to make it more explicit, and instead allow myself to come to rest in it" (p. 461). Studying the experiences of professionals who regularly operate with crisis situations, as expressed in their stories of intuition and decisionmaking, provided insight on how something implicit emerged to prompt and convince that a particular way of explicit action was appropriate. U.S. Armed Forces officers were such a group of professionals who expect to operate in and anticipate decisionmaking in crisis situations.

Professional Praxis and Learning Intuition

Intuitive Decisionmaking in Life Learning Praxis

A selected overview of modern research and thinking about intuition and decisionmaking in the last 75 years established how intuitive awareness and deliberate learning has evolved from philosophical thought of the 20th century to ongoing exploration and experimentation in the present decade (Kahneman & Klein, 2009; R. G. Brockett (personal communication, November 5, 2010); R. J. Wlodkowski, (personal communication, November 2, 2010). Examples in this dissertation, selected primarily in the profession of medical nursing, reflected on practical use of intuition in crisis decisionmaking (Benner & Tanner, 1987; Lyneham, Parkinson & Denholm, 2008a, 2008b; Patel, Gutnik, Karlin & Pusic, 2008; Dowding, Spilsbury, Thompson, Brownlow & Pattenden, 2009).

Even with indications of scientific method to chart potential paths for future advanced research, quantitative means may not always provide an ability to adequately understand, describe, and apply intuition (Polanyi, 1964). Comparatively, qualitative study of a select group of adult leaders may lead to insight and appreciation on a purposeful sampling of professional experiences in intuitive decisionmaking. This outcome occurred in this research. Participants' narratives−presented in their own words, recollections, and reflections−promoted an advance to improved contemporary adult education. The study indicated that there was an *art* and science of intuition and decisionmaking in crisis.

Two of the more frequently discussed forms of intuition in professional literature were naturalistic decisionmaking (NDM) promoted by Klein (1986), and the heuristics and biases (HB) approach of Kahneman and Tversky (1973). Both approaches had similarities, but both approaches also displayed distinctive differences. The NDM modeled possible, probable, or provable causes in a particular intuitive decision based on cues in the context of a situation. The HB model illustrated a "skeptical attitude to expertise and expert judgment" and a caution to possible biases and overconfidence which may adversely affect simplified decision points (Kahneman & Klein, 2009, p. 517). In both models, the likelihood of quality in intuitive judgment required an understanding of the *conditions* [emphasis added] of a particular environment, and the opportunity to "learn the regularities of that environment" (p. 515). Kahneman and Klein (2009) concluded that "subjective experience [solely] is not a reliable indicator of judgment accuracy" (p. 515).

Research by Klein, Calderwood, and Clinton-Cirocco (1986) examined expert performance in high stress occupations when quick decisions were required to minimize practical hazards and injury or death. After studying fire department commanders in crisis situations at fires, a finding emerged that these commanders usually experienced an immediate conclusion on a satisfactory action to implement in emergent conditions. With more than a decade of practical and virtual experience, fire department commanders used a *mental simulation* to envision if a first mental impression made sense. They could execute the action immediately, or modify action *in real time* [emphasis added] as the situation unfolded on the scene of the fire. According to Klein, "This recognition-primed decision (RPD) strategy is effective because it took advantage of the commander's tacit knowledge" (Klein, et al. 1986).

Assessing Naturalistic Decisionmaking

In *Sources of Power*, Klein (1998) assessed his psychological observations of the previous two decades and ongoing development of how people think and act in crisis. He believed "two primary sources of power are pattern recognition (the power of intuition) and mental simulations" (p. 289). He also spotlighted that storytelling, with its merging of metaphors and analogues, created an ability to relate and better understand past events for application to the present and possibly the future. These connections may be "seeing the invisible," or as Klein described this comparison-contrast, the "perceptual discriminations and expectancies" (p. 288).

Klein promoted a naturalistic decision making (NDM) model that he developed during his research in the 1980s. A conference on NDM sponsored by the Army Research Institute in 1989 confirmed several parallel investigations by researchers on the phenomenon of naturalistic decisionmaking (Klein, 1997). Momentum continued through the next decade (Klein & Wolf, 1995; Klein, Wolf, Militello & Zsambok, 1995) to identify aspects such as *expertise* and experience linked to the importance of *situational context* in making a satisfactory first decision in conditions of *uncertainty*. Interviews with research participants probed what cues might be implicit and initially unknown to the expert. Besides implied or distinct environmental cues, researchers visualized the patterns that occurred as described by the recollection of participant experts. The research indicated that some decisions are performed without explicit analysis.

Naturalistic decision making, refined by Klein's Recognition Primed Decision (RPD) model, can be sequenced as a three-echeloned RPD. Two echelons impacted on visualizing intuition. Klein and Klinger (1991) illustrated a simple match where solution is obvious to the individual, and decided on immediately for action. This action was intuitive-oriented. Next was a situation that required momentary evaluation and dynamic modification to an initial course of action in progress. Rapid yet conscious synchronization of emergent conditions of change and context required an additional decision. A third echelon was similar to the previous synchronization, but added more complexity and ambiguity when "confronted with time pressure" (p. 16). (See Figure 2.5.)

The most complex level of decision was a situation with conditions that were changing rapidly, and preliminary decisions were about to become obsolete that would not satisfy the emergent conditions. Perceptive evaluation revealed flaws in action that required modification, or an option was judged inadequate and rejected in favor of the next most typical action. All of these model variations had a decision basis in prior *experience* in order to effectively evaluate and decide.

In semi-structured interviews, Klein and fellow researchers identified methods that used aspects of naturalistic decisionmaking in field settings "to elicit the cues and contextual considerations influencing judgments and decisions" (Kahneman & Klein, 2009, p. 517). Klein accented that experiences are important in the formation of expertise and that "expertise depends on perceptual skills" (p. 287). Gladwell (2005) supported the developmental perspective of expertise as a combination of experience and *reflection*. His study of cases in varied professional disciplines suggested that "being able to act intelligently and instinctively in the moment is

possible only after a long and rigorous course of education and experience" (p. 259). Perception and experience appeared to be intimately connected.

Figure 2.5 Recognition-Primed Decision (RPD) Strategy: Intuitive and Emergent
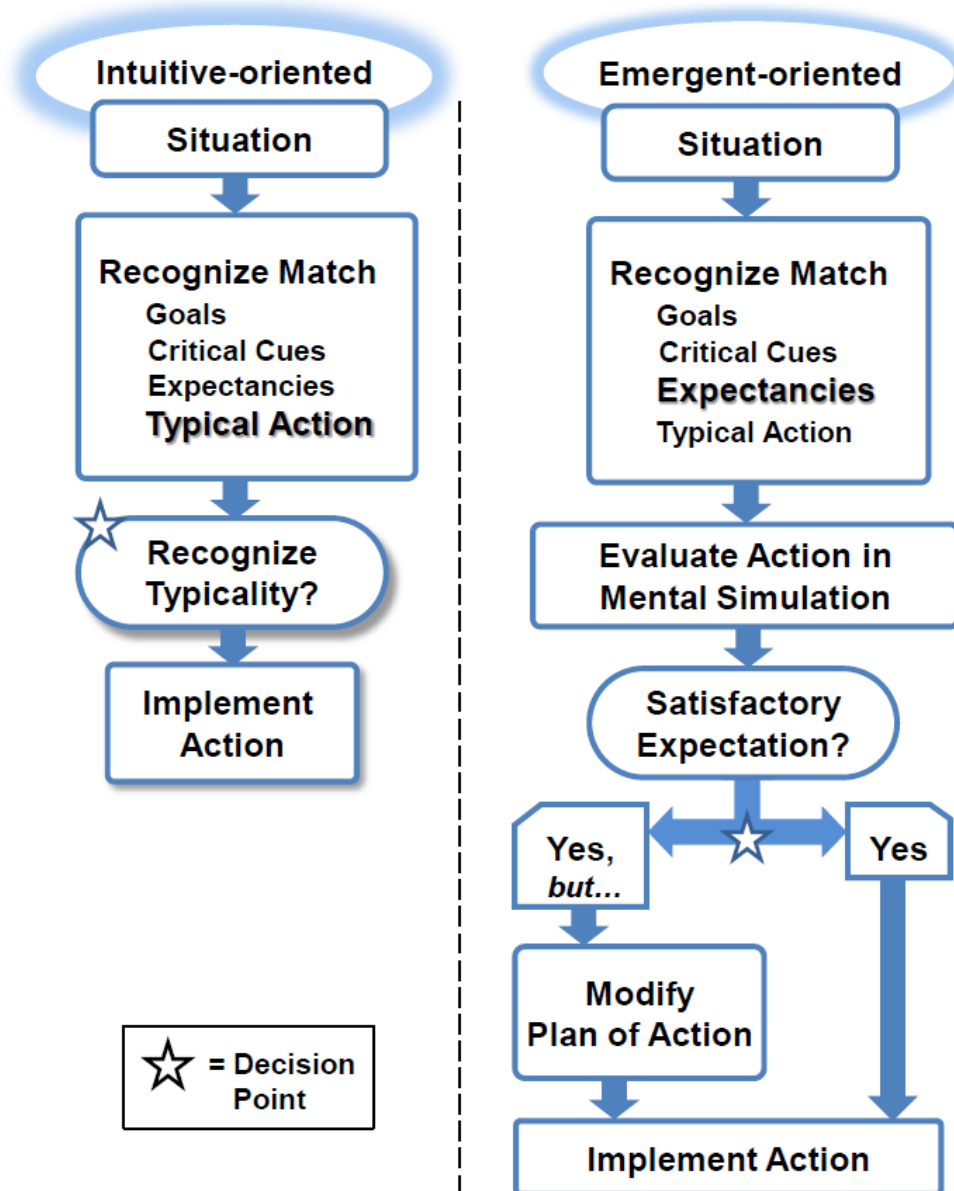
Figure 2.5. Research by Klein and Klinger (1991) on expert decisions without performing analysis. A RPD model (Klein, 1989) presented decisionmaking as immediate coherence− [typical] intuitive, or emergent in conditions which prompt real-time decision and action based on expert experience. Adapted and applied from "Naturalistic Decisionmaking," by Klein and Klinger (1991) in *Human Systems IAC Gateway*, XI, pp. 17-18.

Lehrer (2009) illustrated the importance of how a situation is presented and often skewed how an individual may interpret conditions and a decision to act intuitively or deliberately to that interpretation. "Emotions, instincts, and mental shortcuts" could encourage making a wrong decision (p. 76).

Naturalistic decisionmaking was a valued adjunct to analytical thinking. What was *not* [emphasis added] present or stated can be significant. Klein (1998) provided the following example:

> When you give someone instructions or receive instructions for carrying out a task, you may begin appraising whether any important aspects of communicating intent have been left out, or you may appreciate the skillful way some characteristics of intent were described (p. 292).

In *The Power of Intuition* (2003), Klein complemented the value of intuition "with analysis to support your intuitions" (p. 284). He recommended evaluating a first impulse or impression based on previous experiences and imagining−conducting a quick mental simulation–of possible action outcomes. This understanding of context in an immediate instance appreciated the likelihood of success, delayed results, or failure. When asked to define intuition, Klein stated that "intuition is how you turn *experience into action* [emphasis added]. It is the set of hunches, impulses, insights, gut feelings, anticipation, and judgment stemming from previous events in life" (p. 293).

Notwithstanding, decisionmaking can sometimes be better addressed with a model of formula or rules. Parameters, such as heuristics, can simplify decisions. A *heuristic* is any systematic reasoning, exposition, or argument that juxtaposes opposed or contradictory ideas and usually seeks to resolve their conflict. A heuristic serves as an aid to learning, discovery, or problem-solving by experimental and especially trial-and-error methods. (*Merriam-Webster Online Dictionar*y, 2011). Heuristics also allow for self-educating techniques and informational feedback in order to improve performance. An example of a heuristic is, "Executing a good plan now is better than waiting to conduct a flawless plan later."

However, modeling how to guide toward a solution with a heuristic can have numerous flaws in execution. For example, consider the heuristic, "If you are having difficulty understanding a problem, try drawing a picture." This alternate approach may appear elegant in concept, but assumes a host of issues such as being able to communicate effectively with graphic

symbols toward a satisfactory solution. Other potential issues included the ability to accurately sketch the critical elements of the problem, or correctly portray the fundamental nature of the problem.

Kahneman differed in his opinion of intuition and coined the term "illusion of validity" to describe his concern with opinions based on clinical intuitive judgments rather than statistical data. Proponents of a heuristics-bias approach intended to "compare expert performance by formal models and rules and to expect [intuitive] experts will do poorly in such comparisons" (Kahneman & Klein, 2009, p. 518). Conditions that cause imperfect intuition can be a specific setting as unfamiliar, an anchoring phenomenon that biases a decision by the manner in which an initial question is posed, or an absence of skill. Expertise may be *domain specific*. Kahneman and Klein called this "fractionalized expertise" (p. 522). The opposite of recognized familiarity was recognizing an anomaly to what is expected and the opportunity for novel solution. "Recognizing anomalies …are detecting violations of patterns in the *external* [emphasis added Kahneman and Klein] situation" (p.523). They believed that detecting an anomaly or pattern in an *internal* [cognitive process] situation was less likely, even for experts. *Overconfidence* can result.

Nonetheless, the two models of NDM and HB had some common ground on the assumption of intuitive judgments and preferences: "they are automatic, arise effortlessly, and often come to mind without immediate justification" (Kahneman & Klein, p. 519). The Kahneman and Klein collaboration in 2009 resulted in conclusions on conditions that indicated a level of credibility for intuitive expertise. Several of those conclusions were as follows (pp. 524-525):

- Skilled judges [leaders] were often unaware of the cues that guide them.
- "True experts…know when they don't know…Nonexperts certainly do not know when they don't know."
- Key determinants in trusting intuition are knowing the specific context of an intuition, and if the individual has had to learn the regularities of that particular environment toward expertise.
- "Validity and uncertainty are not incompatible…warfare are examples."
- If an environment provides valid cues and good feedback, skill and expertise will eventually develop in individuals of sufficient talent.

- Intuitive judgment can emerge from a developed skill or inappropriate use of heuristic process.

Considering Heuristics and Intuition

Heuristic principles can assist an individual to reduce complex tasks to simpler judgmental actions. This technique can be very useful, especially in time compressed situations that require a decision, but can also lead to significant systematic errors. Tversky and Kahneman (1974) commented that heuristics can be fraught with unintended bias. Error can include lack of an appropriate code to relevant available information. The possibility of bias existed in a judgment of actual probability and the stress of a conflict in an individual's total belief system. "Anxiety narrows focus of attention, often resulting in overfocusing or tunnel vision" (Baumann, Sniezek & Buerkle, 2001, p. 155).

Glöckner and Witteman (2010) suggested that "good choices" reflect decisions when information is representative and sufficient information is presented without bias. The issue of precluding bias was possible, but may involve conscious and unconscious processes at a particular time and situation, as well as involve individual motivation and emotional factors.

An issue of linking perception and experience questioned a vantage of clarity when researchers think they are studying similar, or the same phenomenon when they "are investigating markedly different things" (Yates, 2001, p.17). Yates developed a linkage of a decision's efficiency or deficiency with an idea that decisionmakers might "know too few facts that really matter and too many about things that don't" (p. 32).

Yates (2001) introduced a form of automatic decisionmaking as "effortless, uncontrollable, and often cognitively inaccessible" (p. 22). In Yates analysis, two problematic issues in naturalistic decisionmaking may require additional study: (1) individual differences in learning ability; and (2) implications of basic learning principles. One assumption was that repetition of tasks will eventually evolve to expertise. If outcomes other than expertise are possible, a concern was the development of "experienced incompetence" (p. 24). Expertise needed to be verified to a desired standard of performance. He voiced a concern that ingrained dysfunctional decisionmaking was "bad habits" and might be automatized. In this case, a more realistic expectation would be to attempt select adjustments to naturalistic decisionmaking procedures that had been confirmed in previous experiences (p. 25).

Uncertainty complicates. According to Tversky and Kahneman (1974), three particular issues in judging under conditions of uncertainty were as follows: representativeness, availability, and anchoring from a known point. *Representativeness* can be inaccurate when "similarity, or representativeness, is not influenced by several factors that should affect judgments of probability" (p. 1131).

An *availability* frame related to the ease with which an occurrence can be recalled. Tversky and Kahneman (1974) noted that: "Lifelong experience has taught us that, in general, instances of large classes are recalled better and faster than instances of less frequent classes; that likely occurrences are easier to imagine than unlikely ones; and that associative connections between events are strengthened when the events frequently co-occur" (p. 1128).

Notwithstanding, Hall (2002) provided anecdotal evidence that physicians make errors in judgment due to institutional biases that stressed the desire for objective assurance of a result rather than including a humanist approach of insight and intuition. She also cautioned that medical decisions were "more complicated than the simple provision of more information" (p. 217), and can be skewed for recall and risk-taking based on "emotional strength of a memory" (p. 220). This phenomenon of *anchoring* exemplified Tversky and Kahneman (1974) comments that " different [decision] starting points yield different estimates, which are biased toward initial values" (p. 1128). They also stated that experts and "their intuitive judgments are liable to similar fallacies in more intricate and less transparent problems" (p. 1130).

Exemplifying the Intuitive in Praxis

Whether a problem was simple or complex, "intuition has seldom been granted legitimacy as a sound approach to clinical judgment" (Benner & Tanner, 1987, p. 23). However, they provided perspectives with which to assess and support the concept of intuitive judgment and decision from the Dreyfus research team findings (1985) as follows:

- Pattern recognition.
- Similarity recognition.
- Commonsense understanding.
- Skilled "know-how."
- Sense of salience.
- Deliberative rationality.

These approaches were fallible, but were useful as multiple means of search and deliberation. They suggested "trying on" various approaches to understanding a problem and to not be limited to just one immediate interpretation of an environment (Benner & Tanner, 1987, p. 29). This deliberate aspect of assessing an intuition did not negate intuitive value but suggested a supportive complement to intuition when time allows such consideration. However, feature detection and template matching schemes were often too simplistic to understanding pattern recognition in the "ambiguous and fuzziness of unstructured, real-life situations" (Benner & Tanner, 1987, p. 24; Dawson, 1993; Dane, 2007).

When using similarity recognition to discern patterns, a logical complement was to use dissimilarities for contrast of what is not occurring and what action should occur. To illustrate what aspect of "commonsense understanding" means, Benner and Tanner (1987) quoted an expert clinician explanation of this sensing as, "Stupid stuff – what [patients] look like, how they talk, how they eat their breakfasts" (p. 25). Benner and Tanner illustrated skilled "know-how," indicative of embodied knowing, with the image of an experienced nurse inserting an intravenous catheter with the sensation of the catheter tip to the patient's skin being an extension of the expert nurse's fingers and tactile knowing. This example was similar to an illustration by Polanyi (1964) as he describes the understanding that a blind person experiences in tapping a cane to some unseen immediate environment. The tip of the cane became, for the blind person, a physiological extension of recognizing and knowing. The blind person perceived and knew.

For Benner and Tanner (1987), sense making of salience was perceiving and understanding that certain *cues* or indicators in a host of surrounding stimuli are more important than other stimuli. Clarity may not be coherent, and yet, previous extensive experience can signal a critical prompt to act immediately in a certain manner (Eisenberg, 1979; Elstein & Bordage, 1988; Engel, 2007). Benner and Tanner described observations of this level of expertise in nurse care:

> The [expert] nurse who no longer relies on an analytical principle (rule, guideline, maxim) to connect an understanding of the situation to an appropriate action. The expert nurse, with an enormous background of experience, has an intuitive grasp of the situation and zeros in on the accurate region of the problem without wasteful consideration of a larger range of unfruitful possibilities (p. 28).

Benner and Tanner (1987) acknowledged that clinical lectures and procedural rules have an important place in nurse training and education. However, to nurture a nurse's "well-honed

sixth sense" and to learn "how expert nurses use intuition," Benner and Tanner recommended the recurring use of case studies with detailed *feedback* on assessed case relationships, recognizing principles of specific causes and effects, and emphasizing encouragement and validation by expert nurses (pp. 23 and 31).

Earlier research by Benner (1984, 1985) modeled expert nurse practice with the inclusion of intuition. A phenomenological study in 2008 by Lyneham, Parkinson, and Denholm reconstructed the expert [intuitive] stage of Benner's model into three phases as follows:

- Cognitive intuition.

- Transitional intuition.

- Embodied intuition.

This triad suggested a subconscious phase of assessment in decisionmaking. Then, a transition occurred to conscious thought or physical sensation, and transformed as expert confidence in cogent thinking. These phases combined with physiological and cognitive signals to prompt an immediate decision.

Not all research agreed with Benner. English (1993) disputed Benner's (1985) model of skills acquisition, and in particular, the lack of clarity on defining intuition and perception. English acknowledged principles of social learning theory by Bandura (1965) and the ability to develop expertise in a specific domain or context. However, he believed the ascending levels of skill proficiency proposed in the Dreyfus and Dreyfus model, and used by Benner (1982, 1985) as a baseline, did not appear to answer two of English's fundamental questions. These issues were: "Do [expert nurses] use intuition, and [whether or not] such a mental process as intuition exists in this context" (p. 390).

Searching for clarity to understand perception and intuition, English (1993) offered a feature-detection model. He posed that recurring experiences amass a "picture of expectations of events" (p. 391). A schema evolved that comprises commonality and interrelated expectations (Christensen, 2006). When an episode occurred, the expert attuned to unexpected information as a perception. This signal prompted study of an apparent inconsistency with an expectation, and required a search for coherence. English doubted that "Dreyfus's model offers any novel or superior interpretation of cognitive processing" (English, p. 392). For nurse situational analysis

of a patient malady, English favored that "insightful and attentive recognition of patient's needs derives from…diligent observation, sound clinical [scientific] knowledge, and experience" (p. 392).

Knowing the Intuitive as Holistic Appreciation

Given the three integral elements (cognitive, transitional, embodied) of intuitive process from Lyneham et al. (2008), cognitive levels of explicit reflection and learning indicated a combination of experience and knowledge. This integration was grouped, in part, as "the ability to unpack or rationalize the decision after the event" (p. 383). Concurrently, some aspects of this "unpacking" were implicit and stored as tacit knowledge. Next, transitional intuition was a phase of connecting this cognitive reflection with embodied physical sensations, but differed from cognition in an inability to explicitly describe the knowing. A study participant struggled with a description this way: "Just seeing things I don't know what I am seeing that is different…but I know something is going to happen and the gut wrenching tells me to listen to what is there but I can't see" (p. 384). Lyneham et al. posed that this knowing "is an encounter in which they [emergency care nurses] become aware of an impending clinical event before it occurs and with no understanding as to why they know what they know" (p. 386). Finally, embodied knowing appeared to be the integration of extended periods of professional knowledge and experience which transformed implicit understanding into explicit practice capacity, decision, and action.

Ruth-Sahd and Tisdell (2007), having conducted a phenomenological study with novice nurses, identified three dimensions supportive to intuitive knowing. These dimensions were (1) prior life and job experiences, (2) the importance of a "spiritual source" (p. 127), and (3) a sense of trust with co-workers and patients. Mutual perspectives of adequate time and physical space to observe patient symptoms and sense emotional states combined with the value of tactile touch that "raised an awareness toward intuitive hunches" (p. 133). The concept of an *intuitive mentor* was mentioned by many of the participants as a catalyst to foster the participant's self-perception of intuitive knowing. Participants expressed the value in their ability to see these mentors as *role models* who "read people," or "zeroed in on situations which allowed them act quickly," and "took in the whole situation at once" (p. 127).

Lyneham et al. (2008) cited the Dreyfus and Dreyfus (1986) study and the distinction in phrases of *knowing that* and *knowing how* [emphasis added by Lyneham et al.] The "knowing that" aspect was the realm of rules and norms that shaped a particular task, whereas the "knowing

how" was the knowledge and confidence of performance in a given context. On occasion, this knowing acquired an embodied perspective, such that "a nurse may not be consciously aware of their practice because it has become a part of their being. There was a deep involvement in their environment and the expert does not see a problem in a detached way" (p. 381).

Emergency nursing expertise exhibited six themes within a paradigm of intuitive practice according to Lyneham et al. (2008) as follows:

- Professional knowledge.
- Professional experience.
- Physiological somatic markers
- Vicarious connection with the patient's condition.
- Consideration of multiple causal assessments.
- Trust in one's own ability during professional practice.

Dealing with a degree of uncertainty *is* a norm (Hall, 2002). This last theme of *trust* could be accented as perceived self-efficacy "to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3).

Of the six themes in intuitive practice, the Lyneham et al. (2008) researchers suggested that the latter three themes of feeling, syncretism, and connection "are the essential nature of the phenomenon of intuition" (p. 104). These cognitive markers combined with physical symptoms to form a *holistic* appreciation of a condition and context.

Feeling was described by participants as different from a "fight or flight" sensing; they described "feeling inherent in intuition precedes the event and the fight or flight reaction." One participant called it "a scrunching stomach and then you go trying to find out" (p. 105). Another participant represented intuition as a "quiet voice that nags at you until you do something to shut it up" (p. 105).

Lyneham et al. (2008) used the term "syncretism" to mean outside the rational self. The *Merriam-Webster Online Dictionary* (2011) defines *syncretism* as the combination of different forms of belief or practice. This perspective indicated an attempt to unite and harmonize stimuli without critical examination or logical unity.

For *connection* to sense particular cues in a specific medical setting, Lyneham et al. (2008) noted that relating with a patient's condition is "not verbal or physical, it is an energy, a

powerful force that draws the nurse to the patient" (p. 104). One nurse visualized connection "as if they are in a bubble. You are aware of it, it's not anything that you can touch" (p. 104).

Characterizations of nurses and their use of intuition, identified by Miller (1993) and referenced in Lyneham et al. (2008), group five descriptions as follows: "willingness to act on intuition, the skilled clinician, having a connection with clients, interest in the abstract, and a risk taker" (p. 103). She also noted characteristics in nurses of tending to be extroverted and perceptual. However, intuition can be fallible. Participants recognized the possibility of decision error. When time was available, nurses pursued "traditional and tangential information pathways to support their [intuitive] diagnosis" (p. 107). This additional search aspect aligned with a rational process and normal procedural guidelines in assessing and conducting emergency medical care.

When time is a constraint in decisionmaking, triage is a technique in a dynamic environment that required timely expert decisions on actions to be administered to a patient. The *Merriam-Webster Online Dictionary* (2011) defines *triage* as the sorting of and allocation of treatment to patients and especially battle and disaster victims according to a system of priorities designed to maximize the number of survivors. A research study by Patel, Gutnik, Karlin, and Pusic (2008) in an emergency department of a teaching hospital identified that experienced nurses favor decisionmaking on their intuitive knowledge with consideration to published guidelines for triage classification. Novice nurses remained more fixed to published guidelines in triaging patients. Citing a conclusion by Gerdtz and Bucknall (2001), Patel et al. stated "the goal of triage nursing is not to reach a diagnosis, but to focus on observing and quickly collecting as much relevant data as necessary and assign a category based on this information" (p. 505).

The Patel et al. (2008) study documented triage nurses' perception of triage decisionmaking. Although text-based guidelines provided a baseline for training and education, experienced nurses used a set of "well-developed *heuristics* rather than external guidelines" (p. 513). This heuristic modeling comprised specific key indicators of disease or condition. The initial "look" of a patient and defined guidelines were the norm most of the time, but surges in the volume of patients, limited resources, and traumatic reaction of family members accompanying a patient stressed nurse decisionmaking. In such conditions, the experienced nurses used heuristics developed in their professional practice and often consulted with other expert nurses. These nurses stated that feedback was very difficult to obtain from the hospital on patient care outcome

and their quick triage decisions. Notwithstanding, Patel et al. found "that experienced nurses base their decisions more on their "intuitive knowledge" (p.515), and acted on personal expertise that "becomes internalized and implicitly used" (p. 503).

The Dowding, Spilsbury, Thompson, Brownlow, and Pattenden (2009) study of heart failure specialist nurses (HSFN) noted the importance of this internalized knowing in analytical and intuitive decision context. These nurses made decisions regularly in conditions that remain uncertain and complex. They believed that "the more complex a decision task, the more likely nurses are to use less analytical decision processes" (p. 1315). Wilson (2002) believed certain perspectives of experience can be constructed into an acceptable personal story for meaning, while acknowledging that the story is always incomplete. He suggested that "gut feeling" can be triggered by situational conditions but can be accurate or misrepresent the factual stimuli indicating a cause and effect. His advice suggested the "trick is to gather enough information to develop an informed gut feeling and then not analyze that feeling too much" (p.172). In another analogy, he contrasted and compared this trust and decision as not opening the door to a locked room, but seeing a solution through the haze of personal theories and expectations on meaning.

Hammond, Hamm, Grassia, and Pearson (1987), suggested that "intuition is the most efficient mode of reasoning in situations where an individual is faced with a lot of interrelated perceptual information, where there are no external 'rules' to follow and time is limited" (p.1314). Their continuum perspective was a bipolar model of explicit analysis and implicit knowing with a "quasi-rationality" ranging between these two principles. Hamm (1988) believed that the intuitive process is a rapid, unconscious averaging of implicit information known to the individual, and had the characteristic to interrelate with analytic thought in order to make a decision. Hammond et al. (1987) placed a task for decision in a four element context: (1) perceptible or objective level of information available; (2) conciseness of the fundamental task; (3) the expectation of accuracy in a desired outcome; and (4) time available in which to make a decision. Dowding et al. (2009) pondered how nurses internalize their professional learning. They proposed that expertise may be "a combination of reading of relevant literature, interactions with other professionals, and tacit knowledge from their own and other people's experiences" (p. 1321).

"The credibility of an investigator's representation is strengthened if it is recognizable to participants" (Riessman, 2008, p. 197). Using the language of expert practitioners on their own

intuitive experiences enhanced an appreciation of the phenomenon. For example, using the expressions of nurses in varied time-sensitive or emergency medical situations conveyed a sense of personalized meaning when opinions and decisions rely on something more than explicit rules. This trust in personal intuition, as an adjunct to objectively assess overt conditions in a patient, indicated expert intuition was usually conducted in a specific domain of knowledge. Intuitive decisionmaking may have conditional factors of "time pressure, uncertainty, high stakes, ill-defined goals, and other [disruptive] features of field settings…in all their complexity and messiness" (Salas & Klein, 2001, p. 7).

The former examples concentrated on the nursing profession to demonstrate the value of intuitive decisionmaking in a professional discipline that operates frequently in crisis. Other professions illustrated similar value when an even more intense requirement for intuitive decision occurs. Some professions deal with momentary decisions with immediate personal danger or life and death in the balance. Klein and Wolf (1995) revised firefighter manuals, based on their research of naturalistic decisionmaking, to highlight cues that indicated a pending critical and dangerous action in specific firefighting domains. Fire commander decisions, often immediate and direct, included when firefighters would evacuate a burning building, or remain inside a structure to attempt extinguishing a fire. Implicit cues at the time of decision were eventually identified by the decisionmakers and researchers after detailed analysis of what conditions were observed or felt at a moment of crisis. Other research included military and emergency service leaders and a professional belief that "it is better to make a good decision fast and prepare to execute it well rather than agonizing over a 'perfect' choice that comes too late" (Klein, 2003, p. 80).

Pursuing Tacit Knowledge for Wisdom

Educational psychologist Robert Sternberg was associated directly with numerous research initiatives on tacit knowledge. These studies included U.S. Army research on decisionmaking since the 1990s (Horvath, Forsythe, Sweeney, McNally, Wallendorf, & Williams, 1994; Horvath, Hedlund, Snook, Forsythe, & Sternberg, 1998; Hedlund et al., 1999; Sternberg, Forsythe, Horvath, Snook, & Wagner, 1999; Hedlund, Antonakis, & Sternberg, 2001; Antonakis, Hedlund, Pretz, & Sternberg, 2002; Antonakis, Cianciolo, & Sternberg, 2004; Matthew et al., 2005).

Sternberg's *The Triarchic Mind* (1988) presented his theory of human intelligence that proposed tacit knowledge is fundamental to understanding intelligence. His triarchic stated "that one needs to understand the relationship of intelligence to three things: the internal world of the individual, the external world of the individual, and the experience with the world that mediates between the internal and external worlds" (pp. 57-58).

Sternberg (1988) stated another basic premise in his theory that intelligence was a form of mental self-management comprised of "three basic elements: adapting to environments, selecting new environments, and shaping environments" (p. 11). He visualized three processes "involved in thinking" as metacomponents, performance, and knowledge acquisition (p. 59). These components functioned in an integrated manner with critical thinking to guide decision and action, while performance and knowledge acquisition provide feedback to reinforce effective learning.

Sternberg described intelligence as "not quite like cognitive processes such as perception, learning, and problem solving, but neither is it totally different from them….[Furthermore,] this performance is based upon cognitive (as well as motivational and affective) functioning (p. 70). Sternberg (1988) emphasizes the requirement to "actively seek external feedback" (p. 114).

Learning in experience was a progression of initially "performing a task when it is relatively novel and [eventually] rendering that performance automatic" (Sternberg, 1988, p. 60). Novelty had two conditions: "Novelty can be a function of the situation in which tasks are presented as well as a function of the tasks themselves" (p. 61). However, automatization, although useful in conditions that demand immediate action, was not the desired ultimate outcome of learning in this context. Experience should serve three intellectual functions of "adaptation, selection, and shaping" in order to "achieve the best possible response to the demands of the environment" (pp. 66-67).

Inductive reasoning was the kind of experience that individuals use most often in the "purposive adaptation to, selection of, and shaping of real-world environments relevant to one's life and abilities" (Sternberg, 1988, pp. 65 and 115). Nevertheless, disparate perspectives noted by Sternberg were instances where "flashes of insight or 'leaps of logic'" (p. 171) existed and did not appear related to prior knowledge. (See Figure 2.6.).

Figure 2.6 Triarchic Relationship of Human Intelligence for Decisionmaking
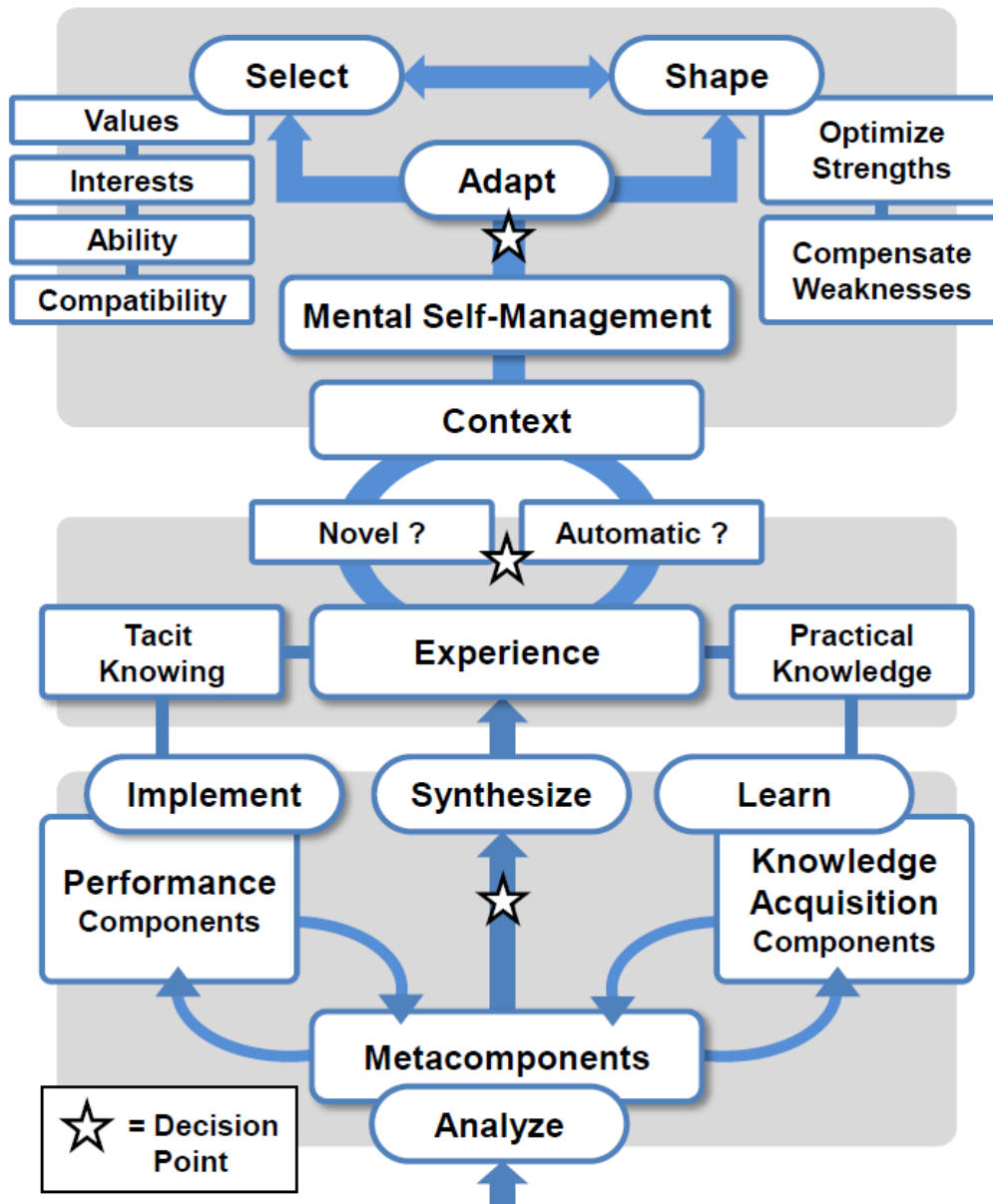
Figure 2.6. Model of intelligence with much of knowledge as practical, tacit, and usually not taught directly. Gray boxes represent Sternberg's three main components of his theory of human intelligence: (1) metacomponential; (2) experiential; (3) and contextual. Mental self-management is the act of decisionmaking. Adapted from *The Triarchic Mind* by Sternberg (1988), pp. 65 and 213.

Research with his colleague Davidson (1984) indicated that in these cases of insight, particular information was understood in its importance to the focused situation. "Seemingly

unrelated bits of useful information" (p. 176) acquired practical meaning in that the focused situation had similarities or dissimilarities with previous personal experiences. Their interpretation of performance suggested the "ability to detect and use clues embedded in the context of" (p. 176) the particular circumstance.

The "practical intelligence," as coined by Sternberg, led directly to his discussion of tacit knowledge in the everyday world. Sternberg and Wagner (1988) stated that "much of the knowledge on which performance in real-world settings is based on *tacit knowledge* [emphasis added by Sternberg], that is, "knowledge that is not openly expressed or stated" (p. 213).

Sternberg, citing research on tacit knowledge with Wagner (1985), posed that this type of knowledge was practical knowledge and informal. They believed that although this knowledge is not usually taught directly, tacit knowledge can be accessible to conscious awareness. Sternberg (1988) listed several heuristics that suggested illustrations on how tacit knowing may be triggered to interact with cogent thought and effective use of metacomponents, performance, and knowledge acquisition. Examples of such or "rules of thumb" were as follows (pp. 216-219):

- Know what the problem is before you tackle it.
- Make sure the time you put in is commensurate with the importance of the problem.
- Take a second look at first impressions.
- Know when to wait and when not to wait.
- Know what you need to know and what you don't need to know.
- Treat others the way you would like to be treated.
- Know your [leadership] strengths...and weaknesses.
- Learn from your mistakes and those of others.
- Determine the extent to which you can change an environment.

Effective tacit knowledge appeared to be a function of individual expertise in a specific domain or field of knowledge. Sternberg's experiments indicated that types of tacit knowledge "are not independent factors but suggest an underlying general fund of knowledge and skill" (p. 228). A contextual environment was critical to how effective an individual's tacit [thought] style is and "depends on the fit of a given style to a given problem, and upon the match between his [or her] pattern of abilities and the styles he [or her] uses in their expression" (p. 294).

Wagner (1987) distinguished a framework of tacit knowledge when applied to two conditions of (1) a localized personal environment in decisionmaking, and (2) a global or the socialized interaction with other people. Sternberg (1988) described the localized focus on short-term tasks with the individual as the responsible action agent, whereas a global orientation considered long term audit and impacts of a decision.

He compared practical and ideal perspectives. These aspects influenced tacit decisions, and suggested that "an awareness of both the practicality and the quality of alternative courses of action is important to success" (p. 224).

Sternberg (1988) presented a quest for continuing investigation when "understanding the nature of tacit knowledge and its role in competent performance in real-world settings – has yet to be completed (p. 228). This appeared to support critical thinking and an embedded sensing of primary and secondary options that can emerge through experience and reflection.

Over ten years later, Sternberg's research still sought to better understand how tacit knowledge was acquired and used (Sternberg, Forsythe, Hedlund, Horvath, Wagner, Williams, Snook, & Grigorenko, 2000). By 2005, Sternberg explored the concept of wisdom and referred to an intellectual process that is typically cyclic. Related to his earlier theory of intelligence, he cited the metacomponents of rational thought: recognizing a problem, defining its nature, representing problem information, formulating problem solutions, monitoring success of a solution, and "evaluating feedback regarding the solution" (Sternberg & Jordan, 2005, p. 348). He spotlighted critical thinking in such rational processes because "when we are educated to rely on our memories rather than our critical thinking, we become susceptible to committing a whole variety of everyday inductive fallacies" (p. 333).

Sternberg suggested that his "theories take ideas that are fairly intuitive and commonplace, formalize them, and present them in a testable way…characterizes phenomena in common-sensical ways" (Glăveanu, 2010, para. 2). Intuition was one of the catalysts to be considered in wisdom, as Sternberg and Jordan (2005) accented the importance of wisdom and ethics in an attempt "to understand the apex of human thought and behavior" (Foreword). In this desire to understand, Sternberg stated that one of the best contemporary psychologists studying wisdom as Paul Baltes.

Optimizing Context in Uncertainty

Kunzmann and Baltes (2005), as colleagues at the Max Planck Institute of Human Development, stated three main factors in a model of wisdom. First in this modeling was "*facilitative contexts* [emphasis added by Kunzmann and Baltes], as determined for example by person's gender, social context, or culture." Next came *expertise-specific factors* [emphasis added by Kunzmann and Baltes] such as life experience, professional practice, or receiving and providing mentorship; and finally, *person-related factors* [emphasis added by Kunzmann and Baltes] such as certain intellectual capacities, personality traits, or emotional dispositions" (Sternberg & Jordan, 2005, pp. 119-120).

This model displayed the importance of experience and the factual knowledge of everyday challenges and opportunities. Similarly from a meta-criteria perspective, wisdom emerged in (1) a lifelong experience of learning; (2) recognition of relativism and tolerance in solving dilemma; and (3) awareness and ability to cope with uncertainty. A representation, as adapted by the researcher in Figure 2.6, illustrated the synergy of intellect and individual characteristics that exhibit a direct interrelationship with internal aspects of an individual, practical life contacts with other individuals and experiences, and, the development of expertise within an individual's culture.

Recent research from European educational and research institutions approached intuition along avenues of heuristics, emotional impacts, and a learning perspective of intuition. This latter concept expanded on the research of Hogarth (2001). This learning perspective posed that intuition relied on mental representations that reflect the entire stream of prior experience. In this concept "intuition is reproductive; it primarily reflects experience" (Plessner, Betsch & Betsch, 2008, p. ix). Opinions differed. Epstein (2008) acknowledged the importance of pattern recognition but rejected it as the principle attribute of intuition. He believed the defining characteristic of intuition was the tacit information acquired during experience that allowed "a more creative and productive manner than if they [decisionmakers] were to rely solely on the linear, analytical reasoning of their rational system" (p. 34).

Nonetheless, definitions on intuition remained divergent based on a particular researcher's perspective. Betsch, T. (2008) accepted the intimate relationship of intuition and experience, but stated a "crucial difference between rehearsal and intuition is that the output of the former is a mental representation of an entity, whereas the latter is a feeling toward it" (p. 5).

He stated an interesting observation that "intuition is more likely to produce conservatism in judgment and decisions because it is primarily driven by consolidated knowledge," but was immediate (p. 8). Value existed in the quest to integrate deliberate thinking and implicit knowing when new information required an individual to adapt rapidly to novel situations.

Betsch, C. (2008) referenced an assumption that "factors within the environment trigger the selection of a [decision] strategy" (p. 233). She referred to learning experiences collected in metacognition rules that can emerge as routines or preferences, rather than an expectation of one resolute way of decisionmaking. Her definition of intuition was "a basic decision mode that uses direct affective reactions toward the decision option as the decision criterion (affect-based decision making)" (p. 234). In earlier research, Betsch, C. (2004) studied the aspect that "intuition and deliberation are not two poles of one dimension, but they are rather two independent dimensions" (p. 234). As a summary of her research on decisionmaking preferences and their value to the individual decision maker, she concluded (p. 243):

- People differ in the way they rely on their heads [deliberate critical thinking] or their hearts [affect-based knowing].
- The knowledge base of intuition seems to be implicit knowledge, whereas the deliberation is based on explicit knowledge.
- Intuition often uses a feeling as criterion for a decision, whereas deliberation uses cognitions.
- It does matter which decision strategy a person uses: When the individually preferred strategy [for knowledge acquisition] can be applied (i.e., the person experiences decisional fit), the subjective evaluation of the decision outcome is more positive (less negative).

Dunne (1997) envisioned that intuitive insight percolates below the surface of conscious awareness. Stimuli in the surrounding environment were constantly bombarding other previously collected implicit and explicit information. She summarized a perspective on knowledge as "a dynamic interplay of experience and conceptualization" (p. 123). New tacit meaning or connections formed and seemed to emerge suddenly as "coherent information from a background of random noise, through the convergence of isolated threads of experience into an integrated and meaningful pattern of meaning" (p. 126). Personal confidence in moments of such

recognition called upon practiced self-efficacy and the willingness to accept degrees of risk in deciding and acting on an intuition.

Nurturing Self-efficacy for Intuitive Decision

Bandura's social cognitive theory (1986) presented a similar interaction of the individual, other people in a specific societal setting, and the general culture within which the individual exists. His triadic reciprocal causation model had functional interrelationships of "internal personal factors in the form of cognitive, affective, and biological events; behavior; and environmental events all operate as interacting determinants that influence one another bidirectionally" (1997, p. 6). This three-way bidirectional model focused on the agency of efficacious individual action.

Confidence in personal judgment based on intuition was significantly linked to personal confidence in decisionmaking (*The Operations Process*, 2010). Self-efficacy offered an interesting avenue of exploration on intuition when "perceived self-efficacy is a judgment of one's ability to organize and execute given types of performances" and "how well they will be able to perform in given situations" (Bandura, 1997, p. 21). He emphasized the value of personal confidence when he states, "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (p. 3). Although Bandura stated that cognitive production "defies explanation of novel thoughts in terms of cueing of performed cognitions" (p. 5), he also believed that "human agency operates generatively and proactively rather than just reactively" (p.6).

The beliefs they [people] held about their capabilities to produce results by their actions are an influential personal resource as they "negotiate their lives through the life cycle" (p. 162). Bandura (1997) promoted the "growth of intrinsic interest…fostered through affective self-reactive and self-efficacy mechanisms" (p. 219), and accented that problem solving "must be adapted to particular circumstances rather than [strategies] simply applied ritualistically" (p. 225). He further recommended that "people must draw on a reliable knowledge base, use their cognitive skills efficiently to ferret out relevant information, construct options, and test and revise their strategic knowledge based on the results of their decisions" (p. 225). In a practical manner, confirmation of satisfactory results was critical in episodic and lifelong learning.

"Feedback that one's work is of good quality progressively raises perceived efficacy, which, in turn, predicts subsequent performance" (p. 126).

Correspondingly, Bandura (1997) cautioned that integrating multiple pieces of information and the emotional state at a particular period can bias decisionmaking. Heuristics can be an easy way of making decisions but can also be prone to ignoring salient and relevant indicators of conditions as they exist or about to occur. In ambiguous conditions, he promoted inferential thinking for individuals to "draw on preexisting knowledge…integrate predictive factors…test and revise their judgments against the immediate and distal results" (p. 117). Sources for this preexisting awareness included "information conveyed enactively, vicariously, socially, and physiologically" (p. 115). Underpinning this learning of decisionmaking was applying metacognitive skills in order to focus "attention, decipher environmental task demands, draw on relevant factual and operational knowledge, appraise the adequacy and versatility of their [decision maker] skills, conduct tests…and evaluate and revise their plans and strategies depending on the results their efforts produce" (p. 223). (See Figure 2.7.).

Figure 2.7 Triadic Reciprocal Causation Model and Self-efficacy
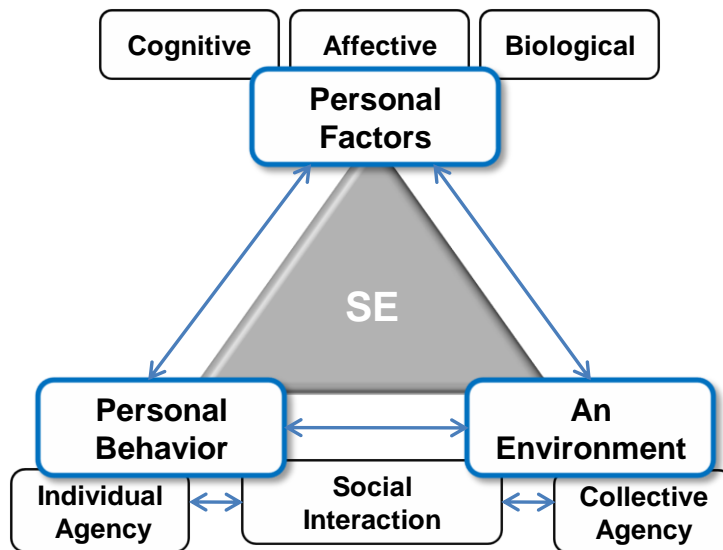
Figure 2.7. Functional interdependence among three main relationships, not necessarily equal in strength, of internal personal factors, behavior, and external environment. Self-efficacy is a product of cognitive processing that can be enactive, vicarious, persuasive, or physiological. Adapted and applied from *Self-efficacy: The Exercise of Control* by Bandura (1997), pp. 6 and 79.

"Success under such conditions requires people to deploy their knowledge and cognitive skills flexibly, creatively, and persistently" (Bandura, 1997, p. 239). These conditions continued in the uncertainty of outcomes in complex tasks, emergent societal expectations, and technological innovations. Bandura used the words *innovativeness* and *creativity* to describe the challenge of overcoming "established ways of thinking that impede exploration of novel ideas and search for new knowledge" (p. 239).

Bandura (1997) recognized the opportunities of making effective decisions in complex and dynamic environments. Although much of his self-efficacy discussion is more oriented to an analytical approach to problem solving, he acknowledged that decisions conducted in the norm of daily life often included "a wide array of information generated by ongoing activities under time constraints…with social and self-evaluative consequences" (p. 451). He highlighted self-confidence as critical to maintaining concentration on a task and the testing of multiple options, rather than shifting reflective thought to self-doubt and possible personal cognitive and affective deficiencies. To counter this potential diversion from effective decisionmaking, he offered the "belief that complex decisionmaking is an acquirable skill" (p. 454).

Given multiple studies on acquirable skill (Bandura, M. & Dweck, 1988; Dweck, 1991; Nicholls, 1984), Bandura linked such skill acquisition to his concept of triadic reciprocal causation. He stated that personal factors such as belief that an action will cause a desired effect, retaining a strategic outlook beyond an immediate situation, and affirming an option with deliberate thought, when time allows such action, are indicative of the cognitive aspect. Behavior aspect is the outcome of choices that are actually decided upon and conducted. The other aspect of Bandura's triad was environmental considerations such as the perceived or objective conditions in a particular setting, the degree of difficulty recognized in that setting, and the constant of time and space when action may require an immediate effect.

Framing Intuition for Social Construction Effect

Bandura promoted active participation in learning as processes of cognition, motivation, affect, and selection. He cited research (Bandura, 1986; Corbin, 1972; Feltz & Landers, 1983; Kazdin, 1978) to suggest when individuals visualize themselves conducting effective actions, they improve their subsequent performance. Experience is elemental to social constructivism and

confidence in individual learning. "Perceived self-efficacy and cognitive simulation affect each other bidirectionally" (Bandura, 1997, p. 117).

In the concept of ability as an *acquirable skill* [emphasis added by Bandura], individuals "adopt a functional learning goal. Challenges provided opportunities to expand their knowledge and competencies. Errors were a natural part of the learning process. One learns from mistakes" (Bandura, 1997, p. 118). In an analytical manner, Bandura indicated that people must focus attention on a problem, decipher conditions of the situation, compare and contrast relevant factual and operational knowledge, assess personal self-efficacy, evaluate their understanding, and commit to or "revise their plans and strategies depending on the results their efforts produce" (p. 223).

A complementary perspective was belief in the controllability in a particular environment. "Personal efficacy is always exercised within certain environmental opportunities and constraints" (p. 457). Bandura (1997) suggested framing feedback that is clear and concise to the success of an action and that less than satisfactory results be viewed as "negative fluctuations in the context of a trajectory of improvement over time" (p. 457). Intrinsic attitude affected the manner with which experience is processed. Personal confidence in judgment, one of the U.S. Army's characteristics that affect the skill of intuitive decisionmaking, is indicative of a willingness to approach novel solutions and take action.

The means to assess observable actions, cognitive reflections, or somatic sensing during a particular situation may illuminate cues to a decision that were not previously apparent. An after action review (AAR) process created a venue to reflect deliberately on action, and yielded individual learning of how to sustain effective performance or identify specific sequences of action to be aware of that might cue a particular response. Such a feedback process identified why a decision was made and how an action was performed in a time constrained environment (*A Leader's Guide to After-Action Reviews*, 1993). Whether performing a mundane task or reacting to a spontaneous crisis, evaluating its conditions and cues was a critical aspect of learning. The AAR offered critical ways of thinking and reacting explicitly linked to reflection, and could imprint future behavior as an intuitive response.

Affective feedback of somatic information offered differing value dependant on how an individual perceives and interprets those stimuli. Bandura (1997) cited Cioffa (1991) to say that intensity of somatic sensation and the appearance or lack of an uncontrollable threat can convey

very different meanings. Bandura reminded that somatic sensation is appreciated within the context of other indications on self-efficacy too. "These include prior mastery experiences, validation of capability in comparison with others, and appraisals by knowledgeable others" (p. 110). Part of learning mastery was to observe and practice with a master. According to Daloz (1999), "at the heart of development lies a delicate balance between trust and agency–a capacity to let go, to receive clear-eyed what the world has to offer, and also to assert our own power" (p. 244). He states the value of role modeling and mentors. "We need other people to show us, to accompany us, to hold the hope and steady our faith that we will make it. And we need people with whom to practice" (p. 244). In thinking about thinking, he believed that people "need to get better at *thinking* [emphasis added by Daloz]–thinking critically, thinking abstractly, thinking imaginatively" (p. 235).

An issue, then, of improving comprehension of what intuition *is* suggested a dialectic and cyclic approach. In *Mentor: Guiding a Journey of Adult learners*, Daloz (1999) offered that an idea for improved awareness was accepting a holistic view of "moving through and above the problem to see it afresh" (p. 139). This image of a quest, with learner and master dialoging on possible cause-effect relationships, can be enhanced when "a good story transforms our vision of the possible and provides us with a map for the journey" (p. 23).

Practicing Cogent Adult Learning

Hogarth (2001) promoted role modeling and apprenticeship as a form for tacit learning. "Apprentices learn by working alongside their masters and observing what they do" (p. 216). A person's tacit system use similarities and context inputs from neural, sensorimotor, affective, and cognitive systems to indicate conditions and action. A learner considered the conditions in which people learn as a positive or negative reinforcement to effective learning. His terms of *kind* or *wicked* learning structures [emphases added by Hogarth] were essentially about the quality of feedback from the environment that the individual understands. If understanding of stimulus was accurate, a "kind" structure exists; however, if information and "feedback is misleading – no learning or invalid learning can take place" (pp. 185 and 217). This was "wicked" learning.

Intellectual journeys by psychologists and educators in the first decade of the 20th Century illustrated scientific investigation and qualitative exploration that continues into the recent and current decades. Adult learning through practice, concurrent assessment, and subsequent evaluation of outcomes can combine critical and creative thinking to improved

understanding. One venture of exploring intuition and a learning perspective was Hogarth (2001) in *Educating Intuition*. He believed that intuition can be taught. He stated that "it is possible to improve your decisionmaking skills by taking steps to educate your intuition" in a scientific manner (pp. x-xi and 24). The four phases of his educational model are as follows:

- Observation.
- Speculation.
- Testing.
- Generalization.

He believed that "we can influence the rules we use to think intuitively (the *how* of intuition) but not the content (the *what*)" [emphasis added by Hogarth] (p. 26). Furthermore, he stated that "it is possible to learn to use the deliberate system to avoid acting on tacit prejudices" (p. 49).

The characteristics of an individual in how tacit systems are understood and used were integral to perceiving conditions of an environment. Hogarth (2001) stated three types of awareness in his concept of an intuitive framework as follows: (1) a level without conscious awareness that nonetheless is retained by an individual for possible future use; (2) automatic action where the individual is aware "of the action only after it has been taken"; and (3) deliberate action that incorporates explicit decision followed by action (p.196). Hogarth's intuitive framework for learning was to create awareness, encourage imagination, and practice with reflection and iteration for improved intuitive learning. Visualizing through journaling, sketching, and simulations may assist skills of observation, self-assessment, and intrapersonal feedback in learning to accept or challenge domain-specific intuitive responses (pp. 268-269).

For Hogarth (2001), the essence of intuition or intuitive response was that this point occurs with little apparent effort and typically without conscious awareness. He aligned with an experiential basis that assumed learning intuition will occur as part of deliberate learning processes, and that role modeling can transfer acquisition of tacit knowledge. Hogarth suggested seven avenues to improve adult learning within three main parameters of knowing the specific environment, assessing the potential biases of tacit expertise, and practicing a deliberate system of analysis on experience to indicate ways of probable success in future conditions yet to unfold and unknown in their specificity. The seven guidelines (p. 207) in his educational system for intuition were as follows:

- Select, create, or select and create your environment.

- Seek feedback.

- Impose "circuit breakers," that is, periodic reflection on conditions and affect.

- Acknowledge emotions and the potential for bias they express.

- Explore connections and the relative importance toward task success.

- Accept conflict in choice rarely as an *either or* proposition.

- Make scientific method intuitive.

A similar expression by Harbort (1997) suggested a catalytic event when "intuition operates to mediate between the particulars of a given situation and the generalities of common experience, facilitating the formation of intention and the will to action" (p. 142). From his educational perspective on intuition, Hogarth (2001) stated that "the tacit system is particularly sensitive to the use of the *narrative* mode…should consciously use narrative to make connections that would not be suggested by more logical modes of thought" (p. 210). He expanded his idea on visualization as a practice of "perceiving connections automatically" (p. 298).

Visualizing the Unknown to Knowing

Another venture toward understanding intuition was Myers (2002) who caveated his keen interest and experiences on implicit knowing with an acknowledgment, "I know that my intuition sometimes errs" (p.1). Myers echoed the mantra of Polanyi (1958) when Myers stated that "sometimes we intuitively *feel* [emphasis added by Myers] what we do not know we know" (p. 28). Myers wrote from a constructive perspective and emphasizes that intuition is conditional. "Intuition works well in some realms but needs restraints and checks in others" (p. 247).

Myers (2002) defined tacit knowledge as "implicit knowledge, learned by experience but without intention," and described intuition as "our capacity for direct knowledge, for immediate insight without observation or reason" (p. 1). A comparison of intuition to tacit knowledge could be stated as intuition "knows that" and tacit "knows how" (p. 57). According to Myers, expertise was a procedural manner of applying experience which identifies new ways of discerning an issue, making connections among data, and creating holistic sense. Perseverance and personal interest in a supportive environment of resources and mentors, can emerge as insight with no conscious cognition. However, Myers cautioned on misinterpreting intuition as a regular occurrence.

As decisionmaking expertise evolves, rational critical thinking was the companion of intuitive decision-action, when time allows such reflection (Myers, 2002, p. 129). He further stated that "although perception requires attention, unattended stimuli can subtly affect us. Moreover, implanted ideas and images can automatically – unintentionally, effortlessly, and without awareness – prime how we interpret and recall events" (p. 26). Experiences seemed to enhance expertise, and expertise improved the capacity to visualize meaningful patterns. A tacit skill appeared to underlie the conscious ability to visualize. Myers stated that "intuition is *adaptive*. It enables us to drive on automatic and it feeds our expertise, our creativity" (p. 248).

Seeing through the Tacit Past

A third venture concerning intuition was research by Goldberg (2005). He approached concepts of intuition and wisdom within his expertise as a neuropsychologist. His prime premise posed that intuitive decisionmaking is tacit and post-analytic. Wisdom was "the ability to anticipate the events that catch most people completely by surprise" (p. 149). Experience over time was a crucial factor in the implicit and explicit retention of knowledge.

"Intuition is the condensation of vast prior analytic experience; it is analysis compressed and crystallized. In effect, then, intuitive decisionmaking is post-analytic, rather than pre-analytic or non-analytic" (Goldberg, 2005, p.150).

In his book, *The Wisdom Paradox,* Goldberg (2005) shaped a position that experiences over time were integral to a number of cerebral neuro-processes that can result in more effective decisions at an intuitive level. His definition of competence was a particular ability to recognize similarities between new situations and previous experiences with a critical qualifier. His concept of competence demonstrated expertise in a specific domain that uses the storehouse of previous "mental representations [of experience], each capturing the essence of a wide range of specific situations and of the most effective actions associated with these situations" (p. 79). He posed wisdom development is an exceptional capacity to perceive the novel solution well before contemporaries grasp intuitive awareness or new approaches to achieve understanding (p.76).

Experiences and building pattern recognition formed "cognitive templates" that with recurring exposure to stimuli can become "basins of attraction" (Goldberg, 2005, p. 20). Neurogenesis results. Neural connections that are used often would be reinforced with new neural growth and strengthened neural interconnectivity. These strengthened connections function

more efficiently each time the stimulus exercises the neural connection. In a contrasting manner, little used memories atrophy and may not be capable to emerge from implicit to explicit knowing. Experience requires time, as does pattern recognition, at the conscious level and subconscious level. His concise summation is "wisdom and competence are the fruit of maturity" (p. 80).

Goldberg (2005) focused attention on problem solving as fundamentally an issue of "pattern recognition" (p.10). Intuition was not an original occurrence without reference. His comments on a typical pattern or mental representation accented "a very interesting property. It [pattern] contains information not only about the things you have already encountered, but also the information about things you may encounter in the future" (p. 125). The shared properties and features of generic similar experiences overlap and interconnect as generic memories rather than isolated specific instances. He believed that such abstract representations were a repository for patterns or the connectivity from which patterns emerge.

His compelling discussion stated that recurring similar experiences and practice fortify the retention of pattern networks in the brain for "particular motor, perceptual, and perhaps also cognitive skills" (p. 136). A companion to this "pattern expansion" highlighted by Goldberg was his term of "effortless expert." Although not effortless in actual performance, he noted that experience and practice reinforces the mental representation and cause a more efficient metabolic demand on neural brain activity. The example he provided is instructive for making decisions in less than optimum conditions: "Tired, hungry, or under-slept, you will nonetheless be able to perform a familiar task, yet you will fail miserably at a novel task of equal or less intrinsic complexity" (p. 138). Imprinting pattern networks in a domain of expertise for creative processing appeared to improve the opportunity for intuition to surface to conscious epiphany.

Wilson (2002) offered a similar venue for appreciating the tacit nature of making decisions. He posed a premise of an adaptive unconscious. He stated tacit as "the mental processes that operate perceptual, language, and motor functions operate largely outside of awareness" and further defined unconscious as "mental processes that are inaccessible to consciousness but that influence judgment, feelings, and behavior" (pp. 21-23). In probing the implicit perspective of decisionmaking, Wilson suggested questions of "how does the adaptive unconscious decide what to select, how to interpret and evaluate, and which goal to set in motion? In short, what is its agenda?" (p. 35). He listed several requisites. These included: (1) accessibility to selected data; (2) how often a stimulus has been experienced; and (3) how recent

stimuli have occurred in order to activate and become lucid. He referenced "scanning patterns" to describe the sublime nature of implicit accessibility, while multiple types of similar experiences may more firmly imprint a pattern for easier scanning recognition.

Being the Participant-in-Action

Participants in this dissertation research were more than casual observers and recipients of intuition in their professional and individual lives; they were truly participants in creating their own expertise (McGregor, Schunn & Saner, 2007). Dunne (1997) accented an impact of "when we shift from being 'observers' to being 'participants' in the world of information, we change the name of the game immensely. Instead of simply acquitting and utilizing information, we are now generating it, and with that capability comes all manner of opportunity, along with a deeper level of responsibility" (p. 126). A contemporary view stated that "intuitive experiences are relevant to both the professional and personal spheres. In fact, under continued investigation is the role intuition plays in expert versus novice performance of professional responsibilities" (Boucouvalas, 1997, p. 9; Morris, 1990).

In the contemporary era, the U.S. Army continued to explore effective and efficient ways to make decisions (*The Operations Process*, 2011). A primary task is for leaders to "understand and adapt more quickly than their adversaries" (*The U.S. Army Operating Concept 2016-2028*, 2010, p. 34). Army intermediate leaders are expected to use both analysis and intuition in their decisionmaking skills (*Operations*, 2008). The U.S. Army states that its training, professional education, and leader development programs operate in an increasingly competitive learning environment (Pounds & Fallesen, 1994; Pounds & Fallesen, 1997; Pounds and Fallesen, 1998; Noble & Fallesen, 2000). Accordingly, the Army placed renewed emphasis on training, education, and leader development [this includes professional self-development] to produce a new generation of leaders able to succeed in the face of uncertainty and effectively employ emerging technologies within their organizations (Dyer, Centric & Wampler, 2007). Using intuition in decisionmaking, combined with critical and creative thinking, were a lucrative avenue for improved leader performance in time-constrained, complex, and uncertain situations of crisis. "Connecting ideas is important; connecting the right ideas is even more important" (Dempsey, 2011, p. 25).

Projecting Tacit Knowledge in Army Social Science Research

The study of tacit knowledge and intuition in military decisionmaking exemplified a long and direct lineage of social science research over the last several decades by the U.S. Army. The Army Research Institute for the Behavioral and Social Sciences (ARI) is the Army's official research laboratory for training, leader development, and personnel research (*U.S. Army Research Institute*, 2011a, 2011b). In this capacity, ARI was tasked with a special project in 1993 to "identify and explain the 'art of battle command' [The U.S. Army has replaced "battle command" with the term "mission command."] and determine how this concept of leader decisionmaking could "be formally transmitted and taught with Army institutions" (Halpin et al. 1994, p. 1; Horvath, Williams, Forsythe, Sweeney & Sternberg, 1994; Day & Halpin, 2001; Day, Harrison & Halpin, 2009). A significant doctrinal theme was renewed focus on the human element of visualizing conditions and outcomes prior to making decisions.

Major research had been conducted for the Army since the mid-1980s as ARI sponsored several projects on naturalistic decisionmaking (NDM) (Klein, Calderwood & Clinton-Cirocco, 1986; Klein, Zsambok & Thordsen, 1993; Klein & Calderwood, 1996; Klein, 1997). Some principle avenues of research were on situational awareness and recognition decision models. Findings indicated that a rational choice model based on controlled circumstances in laboratory examination was not sufficient for time constrained decisionmaking. Evidence suggested that experience could sometimes identify a satisfactory answer to a dilemma without having to analyze multiple courses of action and choose an optimum solution. Other research of the period (Horvath, et al., 1996; Pounds & Fallesen, 1997; Lussier, Michel & Frame, 1997) gathered promising data for progressive development of assessing tacit knowledge in U.S. Army leaders by using surveys, interviews, and simulations.

By 1998, an ARI research project "established that *tacit knowledge* is both real and consequential within the Army" (Horvath et al. 1998, p. 2). This finding was no surprise and supported a speculation that tacit knowledge is "knowledge that resists introspection and articulation (see Figure 2.8.).

Horvath et al. (1998) defined tacit knowledge as "knowledge that people do not know they have and/or find difficult to articulate" (p. 3). The research findings suggested why this knowledge might remain tacit as follows:

- Pattern Irreducibility. Some knowledge concerns information patterns cannot be reduced to rules or generalizations.

- Context Dependence. Some knowledge is highly dependent upon the context in which it was acquired.

- Routinization. Some knowledge (particularly knowledge of action sequences) can become compiled into routines or procedures that "run" without conscious attention.

- Distribution. Some knowledge is distributed among individuals as a consequence of the division of labor such that no one person possesses the total knowledge of the group.

Figure 2.8 Memory Structure and Tacit Knowledge Acquisition Pathways
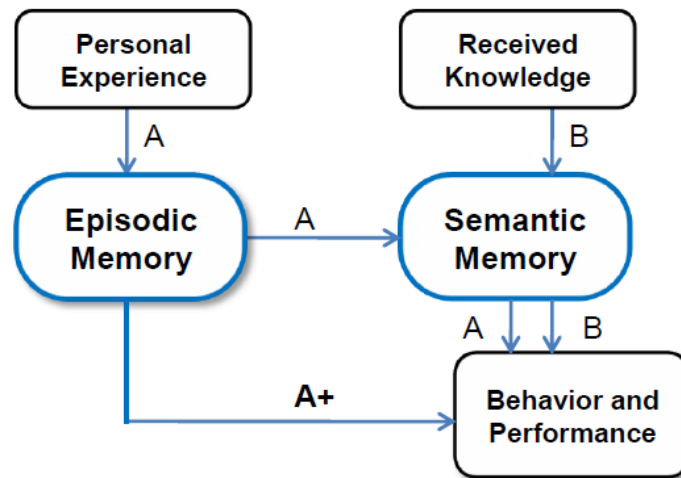
Figure 2.8. A simplified model (Pathway A) of knowledge acquisition with personal knowledge form contextualized personal experience. Personal knowledge can be processed into general knowledge with individual effort (as in Pathway A). Some episodic memory can directly influence behavior without being processed as general knowledge (Pathway A+). Horvath et al. (1998) indicated this knowledge is not readily articulated, and pose that tacit knowledge can be characterized as acquired knowledge on Pathway A or Pathway A+. Received knowledge (Pathway B) resulted from formal instruction, and was applicable for general use as practical generalized knowledge from explicit information that affects intelligence, decisionmaking, and performance. Adapted from Horvath, Hedlund, Snook, Forsythe & Sternberg (1998). This source is ARI Technical Report 1081, *Tacit Knowledge in Military Leadership: Some Research Products and Their Applications to Leadership Development*, pp. 5 and 6.

Another description of tacit knowledge was the ability of "knowing how" rather than "knowing that" (Halpin et al. 1994, p. 28). This knowing how to decide and act appeared to be an implicit acquisition of recognizing patterns developed from extensive experience. Research by Pounds and Fallesen (1994) indicated that problem solving in time-critical dynamic situations may be better served by "a workable –if not optimal–solution" (p. 81). Interviews of U.S. Army officers with increasing levels of practical experience in their profession suggested increasing complexity of tacit knowledge in leader decisionmaking (Horvath et al. 1994). Subsequent research in 1996 on U.S. Army leader decisionmaking included critical thinking to assist in uncovering hidden assumptions and "knowledge of when to use them." This study sought to identify how leaders think and decide and "especially how they interpret what the real problems are and what to do about them" (Cohen, Freeman, Fallesen, Marvin, & Bresnick, 1996, pp. 3 and 37).

In 1998, Pounds and Fallesen studied naturalistic decisionmaking strategies. They suggested that preferences such as clustering information, graphic presentations, verbal description, or a combination of these means affect personal situational awareness. Candidate strategies recommended for improved naturalistic performance were to use experienced tutors or mentors and personal reflexivity, and apply knowledge to novel conditions in time constrained scenarios.

Research products by ARI in 1999 (Sternberg et al. 1999; Hedlund & Sternberg, 1999; Hedlund & Williams et al. 1999; Sternberg et al. 1999) continued to study tacit knowledge and practically-oriented knowledge that U.S. Army leaders use in their on-the-job experiences. "Terms such as 'professional intuition' or 'professional instinct' denote the tacit quality of the knowledge associated with successful performance" (Hedlund & Sternberg, p. 1). This particular study identified three characterizations of tacit knowledge. These features of tacit knowledge in a "complex, context-specific condition" (p. 3) were as follows:

- Tacit knowledge generally is acquired on one's own with little support from the environment as in other people or support media.
- Tacit knowledge is viewed as procedural in structure, as in "knowing how."
- Tacit knowledge is practically relevant in complex and dynamic environments where individuals must learn on-the-job and adapt to rapidly changing circumstances" (p. 4).

A related ARI research project (Hedlund & Williams, et al. 1999) used interviews and requests to Army leaders to tell a story of personal experiences on their personal leadership

learning. In the study findings, knowledge was tacit if four conditions were satisfied: "(1) knowledge was acquired through personal experience; (2) knowledge was intimately related to action; (3) knowledge was not well supported by formal training or doctrine; and (4) knowledge pertained to leadership rather than technical performance" (p. 2).

Sternberg and colleagues (Wagner & Sternberg, 1991; Sternberg & Wagner, 1992; Cianciolo et al., 2001) characterized tacit knowing in multiple studies as *personal* and individual, and a valued implicit knowing action outcome "as opposed to a fact or declarative orientation" (p. 6). Three underlying cognitive processes may be integral to acquiring tacit knowledge. First, selective encoding extracted relevant information from an environment yet unknown rationally to the individual. Next, selective combination was defined as "the perception and imposition of synthesized patterns on the information extracted from the environment" (p.6). Third, selection comparison integrated newly acquired knowledge with knowledge that already exists.

Cianciolo, Antonakis, and Sternberg (2001) studied how to facilitate the acquisition of experience-based tacit knowledge in U.S. Army leaders along two main approaches. One approach, based on Polanyi's (1996) philosophy on tacit dimension and subsequent research, suggested the importance of understanding the situational conditions for use of tacit knowledge. The other approach, originated with Schön's (1983) supposition on self-reflection and action, explained a basis for tacit knowledge development and the ability to "demonstrate effective knowledge without awareness" (p. 9).

A conceptual framework of these two approaches illustrated metacomponents in practical problem solving. Based on research by Antonakis, Hedlund, Pretz, and Sternberg (2002) and the importance of reflection-in-action and reflection-on-action (Schön, 1987), a reframing of a problem can occur when outcomes are unexpected and new procedural or tacit stimuli is assimilated as knowledge.

Subsequent ARI research supported such a model of practical intelligence and tacit knowledge acquisition. In developing expertise, "tacit knowledge permeates much of our automatic cognitive functioning" (Antonakis, Hedlund, & Sternberg, 2002, p. 53). Furthermore, "tacit knowledge is applicable to such complex tasks as leadership, which is based more on implicit than rational-methodical processes" (p. 54). (See Figure 2.9.)

Figure 2.9 Tacit Knowledge Acquisition in a Decisionmaking Model
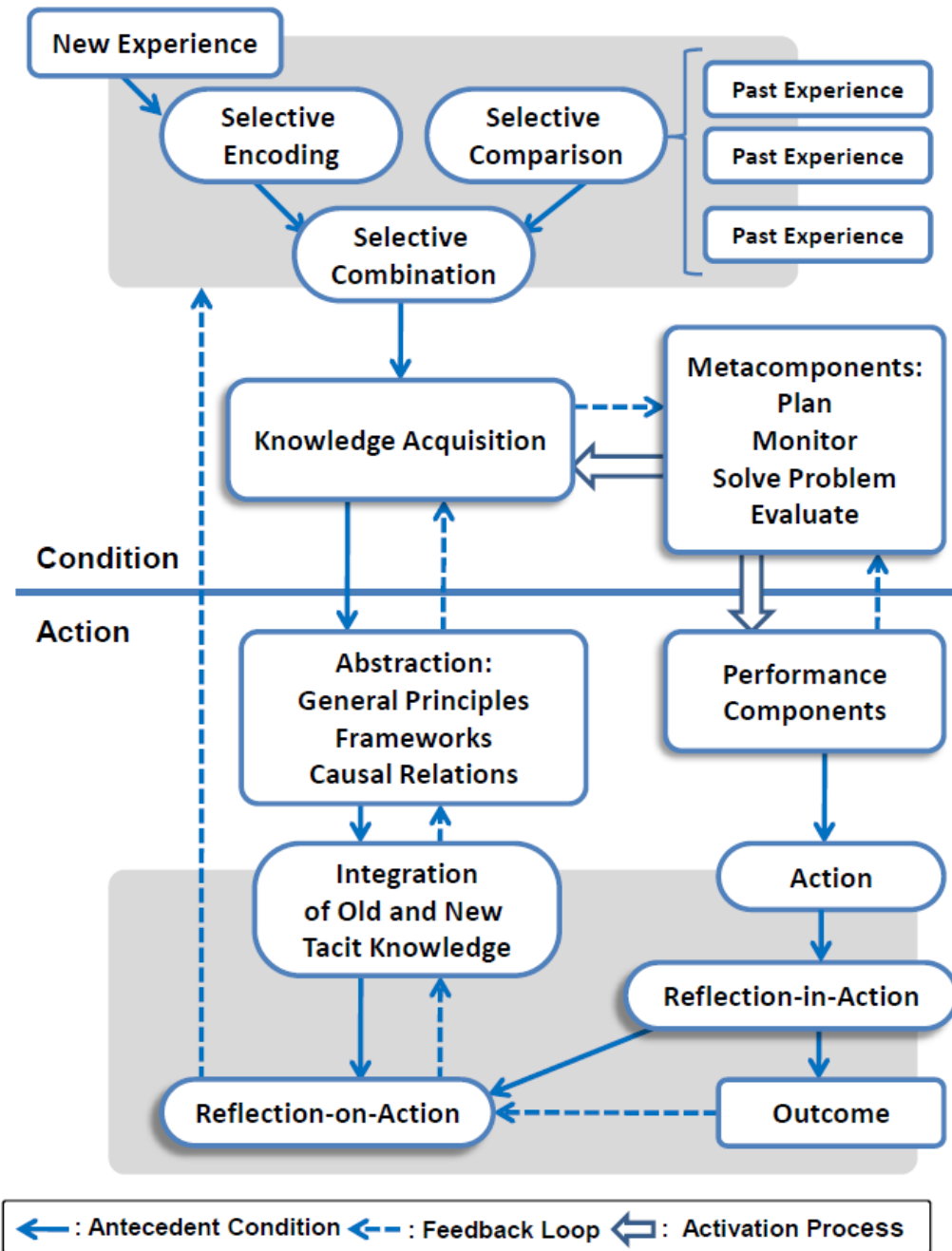
Figure 2.9. Model of acquiring tacit knowledge through reflection-in-action and reflection-on-action. Shaded reflection shapes indicate tacit and practical evaluation of action and the combined condition-action relationship for tacit knowledge acquisition. Adapted and applied from Antonakis et al. (2002) with additive aspects from Schön (1987).

A similar model examined in Antonakis et al. (2001) illustrated a focus on conditional aspects of tacit knowledge and action elements that support acquisition of tacit knowledge. An additional perspective was an understanding of condition-action and the value of reflection on action. The model used tenets of Schön (1987), and his "implicit recognition that research-based models… cannot be made to work until the students acquire an art that falls outside the models" (p. 16). Antonakis, et al. referenced Schön's concept of reflection-on-action as post-analysis. More important from a tacit knowledge perspective was Schön's *reflection-in-action* [emphasis added] as an action is occurring. Reflection occurred while the action is in progress.

Schön (1987) described this concept as "thinking what they [participants] are doing while they are doing it" in a quest to appreciate and understand practice in "situations of uncertainty, uniqueness, and conflict" (p. xi). He used *knowing-in-action* [emphasis added by Schön] to refer to "the sorts of know-how we reveal in our intelligent action–publicly observable, physical performance….We reveal it by our spontaneous skillful execution of the performance; and we are characteristically unable to make it verbally explicit" (p. 25). Stated more simply by Schön, "This knowing-in-action is tacit, spontaneously delivered without conscious deliberation" (p. 28).

Research by Cianciolo et al. (2001) suggested that experience-based knowledge facilitates the acquisition of tacit knowledge. Exploring the experiences of military leaders in the real-world conditions of a particular environment indicated that tacit knowledge was critical to successful performance of practical problem solving.

Sensemaking−the "processes involved in trying to improve one's understanding of a situation, often in response to a surprise"−is essential to reflexivity by fitting data into a frame and fitting a frame around the data" of an experience (Sieck, Klein, G., Peluso, Smith, J. L., Harris-Thompson & Klein, 2007). This research suggested that "most people, even most experts, rely on fragments of local cause-effect connections, rules of thumb, patterns of cues, and other linkages and relationships between cues and information to guide the sensemaking process" (p. vi). In this study, experts attempted to "first clearly understand the situation they faced" and were "much more likely than others [less experienced participants] to formulate high-quality questions geared towards understanding anomalous evidence" (p. 24). Research on self-reflection methods applied to job related and domain experiences indicate that acquisition of aspects in tacit knowing can be taught (Matthew, Cianciolo & Sternberg, 2005).

An Issue of Intuitive Decisionmaking in U.S. Army Doctrine

Decisionmaking and Intuition in U.S. Army Doctrine

A survey of military principles in U.S. Army doctrine displayed a cognitive foundation that U.S. Army officers receive in their training and professional education in order to comprehend intuitive decisionmaking. *Operations* (2011) was one of the U.S. principle doctrinal publications. *Operations* (2011) stated that "commanders continuously combine analytic and intuitive approaches to decisionmaking" (p. 5-4). These principles resided in the leader development and operational doctrine of the U.S. Army.

Other earlier primary doctrinal publications that expressed the principles of decisionmaking in the U.S. Army are *Army Leadership* (2006), *Mission Command* (2003), and *The Operations Process* (2010). Several revisions were in progress to Army doctrine in 2011. These documents and recurring studies by the Army's Research Institute for the Behavioral and Social Sciences (ARI) exemplified a process of how the U.S. Army examines and educates an awareness and understanding of its two doctrinal categories of decisionmaking: analytic and intuitive.

Doctrine is the fundamental and enduring principles of how the U.S. Army thinks and operates; however, U.S. Army doctrine is "a guide to action, not a set of fixed rules" (*Operations*, 2011, p. D-1). U.S. Army doctrine is authoritative, but requires Army leaders to use initiative and creative thinking as they adapt to particular conditions in seeking solutions to problems.

Wlodkowski (2008) noted that critical thinking and analysis have specific roles in decisionmaking as do knowledge and personal skills, but "how and what to do are moment-to-moment choices without a complete and final path of action" (p. 293). Goldberg (2005) offered interesting complements to adaptability in intuition via descriptive and prescriptive knowledge. He believed intuition as "the condensation of vast prior analytic experience…it is analysis compressed and crystallized" (p. 150). Descriptive knowledge was knowledge of the true nature of things, whereas prescriptive knowledge is about recognizing or feeling a personal awareness "about the best course of action…as actor-centered knowledge (pp. 157-158).

In recent decades, the U.S. Army concentrated recurring research on the human dimension of leadership and how leaders make decisions. The Army continued to incorporate that knowledge into its doctrine. *Operations* (2008), stated that "continuously combine analytic

and intuitive approaches to decisionmaking….The two approaches are not mutually exclusive" (p. 5-4).

The merger of these two decisionmaking approaches was addressed in support of tenets in another doctrinal manual, *The Army* (2005). "Doctrine furnishes the intellectual tools with which to diagnose unexpected requirements," and knowing how to use both analytic and intuitive decisionmaking is essential to understanding and applying "practical options based on experience from which self-aware and adaptive U.S. Army leaders can create their own solutions quickly and effectively" (p. 1-21).

In its training and educational strategy (2009) on developing leaders, the U.S. Army required "competent, flexible, and adaptive leaders able to meet twenty-first century challenges" (p. 4-4). These operational challenges existed in a contemporary environment that is ambiguous, uncertain, complex, adverse, and dangerous ("Army Capstone," 2009; "Army Operating," 2010).

Thinking Adaptively in Crisis

Whether dangerous or safe in a particular physical setting, a military leader faced a potential dilemma with the U.S. Army's doctrinal expectation of him or her knowing how to understand and apply intuition in making a decision in crisis (Forsythe, Sweeney & Bullis, 1996; Frame & Lussier, 1997; Hedlund et al., 1998). The implicit nature of intuition cannot be easily quantified (Glöckner & Witteman, 2010). In contrast to intuition, a deliberate decisionmaking technique sequences through a series of practical tasks with specific criteria. This model can be trained and exercised with a measurable outcome to a standard of performance. Critical thinking and concrete knowledge are absolutely necessary in many acts of making a decision. Yet, this deliberate process did not provide understanding of the implicit indicators that often guide to a successful or unsuccessful decision and action. The U.S. Army seemed to realize a requirement essential to leadership, that is, a leader "self-discipline to do *what feels* [emphasis added] or is known to be right" (*The Army,* 2005, p.1-19), but did not provide adequate doctrinal guidance.

An Army concept of "mission command" and "operations process" qualified an emphasis on thoughtful action. The operations process supported how a commander or other leaders implements mission command. A significant gap appeared to exist in how a leader understands and appreciates personal sensory feeling or implicit knowing in order to support making an intuitive decision to act. Doctrinal descriptions indicated the issue:

- *Mission command* is the exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of full spectrum operations. It is commander-led and blends the art of command and the science of control to integrate the warfighting functions to accomplish the mission (*Operations*, 2011, p. 5-2).
- In order to effectively perform mission command, leaders conduct the *operations process* sequence to "understand, visualize, describe, direct, lead, and assess operations. They [must] understand the problem…visualize the end state and the nature and design of the operation…describe the time, space, resources, purpose, and action… direct the warfighting functions…[and] continually lead and assess" (*Operations*, 2011, p. 5-3).

The intuitive aspect of decisionmaking is embedded doctrinally in this process and concept. Notwithstanding, how does the leader know−intuitively−that he or she understands the problem and knows how to accomplish a satisfactory end state?

The U.S. Army Learning Concept for 2015, published in January 2011, described an adult learning model to provide "credible, rigorous, and relevant training and education" in order to develop adaptive, thinking leaders (pp. i and 5). These leaders must be "comfortable with ambiguity and quickly adapt to the dynamics of evolving operations…be adept at framing complex, ill-defined problems…make effective decision with less than perfect information" (p. 10). The concept stated a requirement to be continuously adaptive in a learning model. Two themes are: (1) to improve "the quality, relevance, and effectiveness of face-to-face learning experiences"; and (2) to extend learning in a lifelong "continuum of learning through the significantly expanded use of network technologies" (p. 17). Frequent feedback on ideas and practical performance ensured a positive spiral effect toward improved critical understanding and creative thinking. Senge (2006) stated the importance of such an after action review process to evaluate action and reflect toward practical improvement and learning from our experience" (p. 290), but also emphasized the essentiality of a supportive environment (Senge, Cambron-McCabe, Lucas, Smith, Dutton & Kleiner, 2000). The U.S. Army's learning concept (2011) stated a "collaborative learning environment is nonthreatening; mistakes can be made…[in order] to recognize better solutions" (p.19).

The focus of this lifelong learning model centered on nine competencies with four aspects particularly important to intuitive decisionmaking: (1) adaptability; (2) initiative; (3) critical thinking; and (4) problem solving. Within these two themes and four descriptors, *adaptability* was the central idea. This adaptability required processes that develop "the cognitive, interpersonal, and cultural skills necessary to make sound judgments in complex environments" (*Army Learning Concept*, 2011, p. 16).

Bennis (2004) stated four essential competencies based on his leadership research as follows: "adaptive capacity, the ability to engage others through shared meaning, a distinctive voice, and integrity" (p. 334). London and Mauer (2004) believed "knowledge requirements for leaders include intuitive or tacit knowledge" (p. 238). Antonakis, Cianciolo, and Sternberg (2004) noted a growing interest in practical problem solving ability in leaders, as well as interest linking tacit knowledge. This linkage was "implicit knowledge derived from experience that requires practical problem solving ability" (p. 10).

Illuminating the Dilemma of Intuition

Clearly set in a context of military leadership, reviewing two forms of military decisionmaking–analytic and intuitive–spotlighted a dilemma of understanding intuition and the decision to act on tacit sensation. A definitive analytic process was codified in U.S. Army doctrine as the Military Decisionmaking Process (MDMP). This analytic learning model was a deliberate problem solving process in order to analyze and make a decision. The model exhibited nil constraint on time in which to make a decision. The sequential process analyzed a task, developed and compared options, selected an optimal option for action, and acted.

Unfortunately, this deliberate process did not readily support making decisions in time sensitive contemporary events such as traditional warfare, counterinsurgency or other forms of irregular warfare missions, and civil-military stability operations. These uncertain and complex conditions often required immediate decisions and actions. In such pressing instances of crisis, the U.S. Army advocated intuitive decisionmaking (*Mission Command*, 2003). However, scant doctrinal guidance existed on how to understand and make intuitive decisions.

An abridged form of deliberate decisionmaking in U.S. Army doctrine (2010; 2011) was called rapid decisionmaking and synchronization process (RDSP). This type of method was similar to other actions in progress and complemented other forms of abbreviated

decisionmaking (Glöckner, A., 2008; Glöckner & Betsch, T., 2008). The intention was to determine a satisfactory solution to a problem in a timelier manner than the time consuming procedures of a deliberate sequential decisionmaking process. (See Figure 2.10.)

Figure 2.10 Military Decisionmaking Process (MDMP) Model
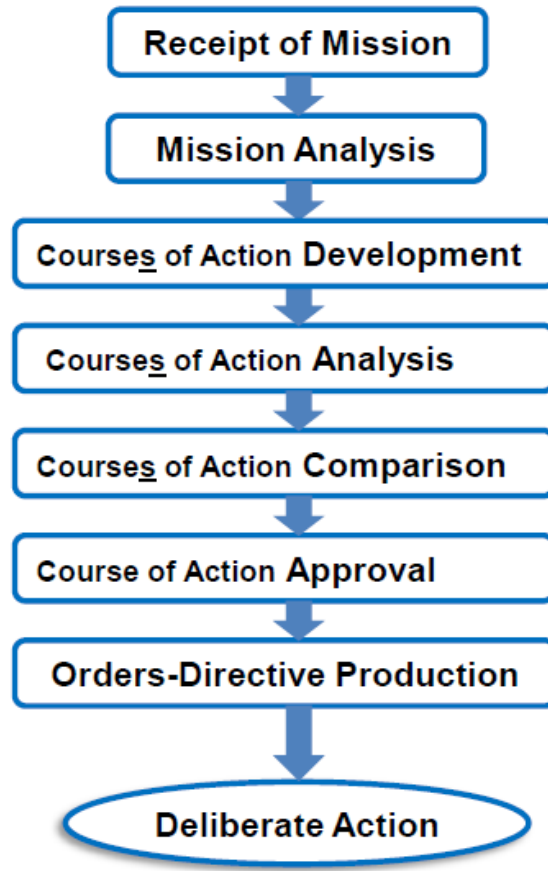
Figure 2.10. A deliberate process of military decisionmaking. Adapted from *The Operations Process (*2011) in "The Military Decisionmaking Process" and "RDSP" found in pp. 5-4 to 5-14 and Appendix B-1 to B-37. Note that this model considers multiple courses of action.

Describing and illustrating intuition in decisionmaking was much more difficult. Army doctrine acknowledged the contrast of an explicit decisionmaking process with an intuitive process, but also stated that Army leaders continuously combine analysis and intuition. Intuition had been described as "the act of reaching a conclusion that emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character" (*Mission Command,* 2003, p. 2-4).

An attempt at defining something nebulous such as intuitive decisionmaking with eight descriptor terms can hamper simple and concrete understanding. The litany on intuitive decisionmaking presented little discussion on processes that allow insightful spontaneity to occur. The U.S. Army's description used a collage of skills such as tactical proficiency and field craft (Fischer & Geiwetz, 1996); attributes such as personal character, physical presence, and intellect (Folds, Booth & Stanley, 2008); and demonstrated competencies to lead, develop, and achieve missions as caveats to a fundamental insight–intuition.

This approach, with a significant expectation of pattern recognition, indicated spontaneity of immediate insight and personal confidence within a particular set of conditions. An essential issue of perceiving and using tacit knowing remained cogent to the act of intuitive decisionmaking. (See Figure 2.11.).

Figure 2.11 Military Rapid Decisionmaking and Synchronization Model
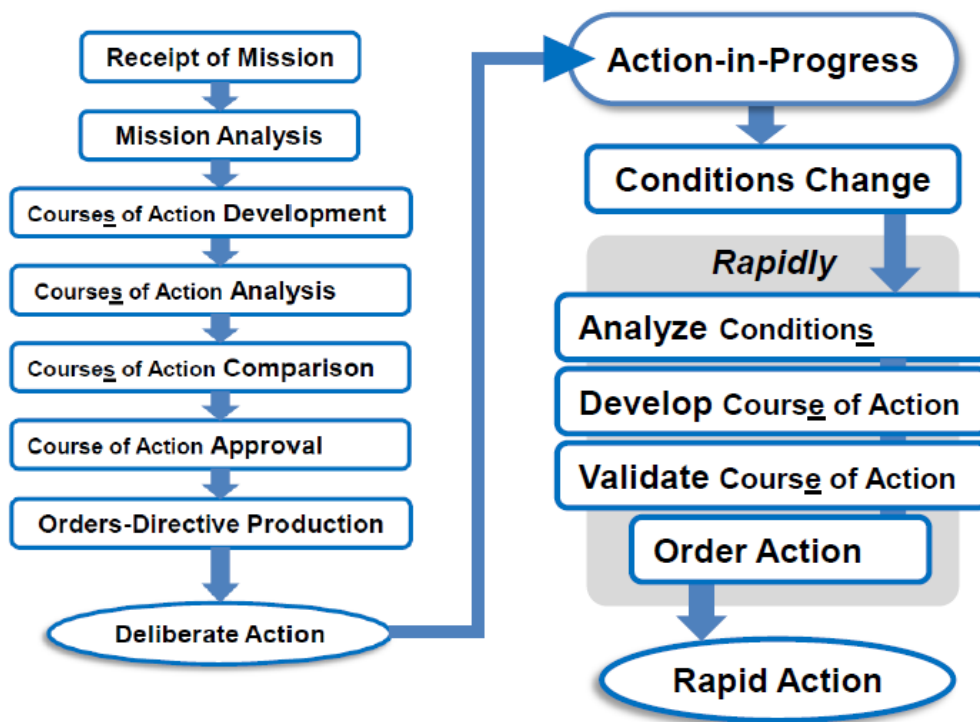
Figure 2.11. A process for rapid synchronization in military decisionmaking. Adapted from *The Operations Process* (2010) in "The Military Decisionmaking Process" and "RDSP" found at pp. 5-10 and 5-14, and Appendix B-38 and B-39.

The rapid synchronization decisionmaking process (RDSP) compared an evolving condition within the current situation to the situation that had been expected to occur. If a planned action was determined to be unacceptable based on the current situation, a new course of action was developed quickly and a decision made to implement an action. The significant difference between the deliberate process and rapid synchronization was reducing considerations−courses of action−quickly to one course of action for analysis and validation. Described as rapid, this technique remained a deliberate process and was not intuitive.

Acknowledging the Intuitive Act

A recent U.S. Army doctrine on decisionmaking, *The Operations Process* (2011), spotlighted the importance of understanding complex problems prior to attempting a solution. This holistic address of problem solving in a contemporary environment was a practical advance in promoting critical *and* [emphasis added] creative thinking. A doctrinal statement in 2010 encouraged decisionmakers to use intuition in order to adapt existing processes when conditions are ill-structured and unclear and emphasized that "leaders combine their experience and intuition with situational awareness to quickly reach situational understanding" (*The Operations Process*, 2010, p. 5-8). The accentuation of design in critical and creative thinking promoted reflexivity by leaders and an aim to seek "new, innovative ways while capitalizing on imagination, insight, and novel ideas" (p. 3-1).

Notwithstanding, a stark contrast existed between the description of deliberate military decisionmaking and intuitive decisionmaking. The deliberate process was described as an explicit and methodical process in *The Operations Process* (2011) spanning over 30 pages, whereas scant discussion of intuition exists in the same doctrinal publication. "Intuition" is mentioned less than 10 times in this publication with one word entries. Even then, intuition was used to describe aspects of deliberate decisionmaking. For example, "under the RDSP [rapid decisionmaking synchronization process], leaders combine their experience and intuition with situational awareness to quickly reach situational understanding" (*The Operations Process,* 2010, p. 5-8). The 2011 update of *The Operations Process* continued to leave gaps in the process description and stated only a short phrase of "using intuitive decisionmaking–in the form of a focused COA [course of action]" (p. 5-12) .

The complexity of the intuitive dilemma required an approach to induce meaning by working backward from the result of an effective intuitive decision. This avenue revealed insightful vantage points of how conditions emerged that were not realized in other task sequence circumstances. As noted by Dewey (1938), "purpose is an endview" (p. 67). He stated that to learn and know purpose, a complex intellectual operation included observing conditions and circumstances, knowing of similar past situations, and judging the potential consequences of a particular action. In fairness to Dewey's description, he presented a pragmatic sequence of decision and action concerning education and experience. Yet, he opened the potential for knowing through more than recollection and deliberate action. He offered the idea of foresight on consequences of acting on an impulse. This might be categorized as the ways, means, and ends of discrete conceptual elements in how to solve a problem. Ways referred to a concept to approach solution, and means were the resources required to act on a problem towards solution. The desired end of this three element construct was the objective or purpose. In this case, *how* [emphasis added] intuitive decision is recognized and used effectively was the end view.

The U.S. Army emphasized pattern recognition as a prompt to intuitive decisionmaking. This type of recognition was "insight and immediate understanding that rapidly dismisses impractical solutions" (*Mission Command*, 2003, p. 2-4). Recognition type decisions were particularly important in situations where available time to make a decision is very limited or immediate. Decisions of this intuitive type required expertise and experience, and were not based on the deliberate processes of a formalized military decisionmaking process (MDMP).

"Intuitive decisionmaking replaces methodical analysis of options with assessment, obtains a satisfactory solution rather than an optimal one, and uses analysis to refine the decision" (*Army Leadership*, 2006, p. 2-4). However, critical thinking as a deliberate process of thought and action, created a firm foundation for understanding a specific situation, perceiving the context of that situation, and being able to sense or know that conditions are or have changed. When facts are questionable or unknown, "gut-level feelings" may be acceptable in determining the decision to act. *Mission Command* (2003) noted that good judgment is critical to the art of command and "…the transformation of knowledge into understanding and quality execution" of a decision (p. 6-2).

Terms in Army doctrine such as "knowledge, judgment, experience, education, intelligence, boldness, perception, and character" (*Operations*, 2011, p. 5-4) attempted to

describe perceptible or known conditions required for intuitive decisionmaking, but did not present an understanding of a *fundamental knowing* process for intuition. Doctrinal terms did not appear to adequately explain how to transform an abstract concept of intuition into a replicable and trusted problem solving process. Notwithstanding, the U.S. Army is committed to augment a traditional military decisionmaking process (MDMP) with cognitive tools to better understand problems before attempting to solve them (Dempsey, 2010). This complement to a MDMP can possibly improve understanding and visualizing risk, complexity, and probable solutions which often demand immediate decisions and action.

An Army general observed recently that "military operations on land require us [the U.S. Army] to *develop the situation through action* [emphasis added by Dempsey]. We aspire to 'know' more than our adversaries, to 'understand' as much as we can before making contact and confrontation, and to be 'precise' in all our actions" (Dempsey, 2010, p. 40). Dempsey's comments suggested deliberate and intuitive adaptability *is* inherent in "mission command [and] is essential for our [U.S. Army] success" (2011c, p. 44). He proposed a requirement to produce agile and adaptive leaders, and suggested that "*inquisitiveness*" [emphasis added by Dempsey] be considered as a leader attribute (Dempsey, 2010, p. 35).

In this regard, a professional quest remained to better understand the phenomenon of intuitive decisionmaking. This obligation to "produce and reward leaders who are inquisitive, creative, and adaptable" was to "prepare our Army for uncertainty – the challenge around the corner that we will undoubtedly be called upon to face" (Dempsey, 2011b, p. 26; Dempsey, 2011d, p. 26). Participant narratives may indicate improved understanding of how intuition functions in their individual experiences of decisionmaking as U.S. Armed Forces officers in 2011. General Dempsey, as the Army's Training and Doctrine Command commanding general, summarized the Army's campaign of *learning* as follows: "we must develop leaders who understand both the 'art' and the 'science' of managing transitions" (Dempsey, 2011d, p. 28).

Summary

Perceiving or understanding how an individual uses intuition to make decisions in crisis was an active and ongoing exploration by a wide range of professional disciplines. Whether philosophical, scientific, or educational in endeavor, one aspect of intuition seemed universal: a form of knowledge exists beyond the realm of absolute empirical proof. Rather than distinctly

separate from explicit knowing, this implicit form of knowing appeared to complement processes of real-world knowledge, practical reasoning, and deliberate decision.

The collective praxis for personal learning required cognitive reflection based on personal or vicarious experiences, feedback from experts, and critical examination of recurring performance and outcomes. The nature of intuition, as perceived by individual participants, appeared to be channeled by experience, expertise, and self-efficacy in their professional competence to make effective intuitive decisions.

Chapter 3 - Methodology

Understanding a phenomenon from the participants' perspectives – the meanings people derive from a situation or understanding a process – requires asking important questions, questions that lend themselves to qualitative inquiry.

Merriam

Introduction

This chapter addresses a methodology for qualitative narrative inquiry on the nature of participants' perception of intuitive decisionmaking. Fraenkel and Wallen (2006) emphasized a common characteristic of qualitative inquiry as a quest to "capture the thinking of participants from the *participants'* [emphasis added by Fraenkel and Wallen] perspective" (p. 431). The participants' perception of how their intuitive decisionmaking occurs was the prime interest in research. The ten volunteer participants were eight U.S. Army officers, one U.S. Navy officer, and one U.S. Air force officer. They were all midcareer officers in their respective military functional areas of expertise.

Professional literature particularly useful in shaping this qualitative research rationale included Guba and Lincoln (1981), Stake (1995), Patton (2002), and Creswell (1998, 2008). Researcher perspectives on qualitative approaches to better understand intuitive decisionmaking and adult educational concepts continued to evolve during the research.

The relevant literature for this research indicated that a proposition of understanding intuition may not be capable of definitive analysis, and might be better discerned through assessment of narratives on personal and vicarious experiences (Hogarth, 2001). The interpretation of participants' stories suggested a way to effectively communicate how a participant perceived intuition and recalled physical or cognitive sensations that resulted in an intuitive decision. Research participants were considered experts of their own experiences on intuitive decisionmaking.

This research implemented a qualitative approach "interested in *understanding the meaning people have constructed* [emphasis added by Merriam], that is, how they make sense of their world and the experiences they have in the world" (Merriam, 1998, p. 6). Research

interview questions introduced initial points of qualitative interest on the personal accounts of participants. The individual stories or vignettes of participants allowed the researcher to collect the reflections of willing participants. Listening to their voices allowed a first-hand opportunity "to explore an educational research problem by understanding the experiences of an individual" and individuals (Creswell, 2008, p. 515). Insight gleaned from participants during the research process guided researcher exploration and a continuum of interpreting and reinterpreting issues that encompassed intuition.

Collecting research data, as a bounded case study, exemplified a researcher-to-participant, one-on-one, semi-structured interview experience. This interview technique yielded considerable richness in detail and personal meaning, and "encourage[d] respondents to fully give their opinions with as much nuance as they [were] capable of" (Sudman & Bradburn (1983a, 1983b). The researcher was responsible and accountable for determining and reporting research findings and recommending avenues of inquiry for additional focused research.

Berg (2007) described the semi-structured interview as a number of predetermined questions presented in a consistent manner, but flexible to develop particular topics with a participant for clarity of mutual understanding that "probe far beyond the answers to their prepared standardized questions" (p. 95). Marshall and Rossman (2006) stated that "in-depth interview strategies are elegant in design, relying on a single primary method for gathering data" (p. 55). As possible meanings started to emerge with the progressive collection of interview data, the researcher identified new directions to pursue in exploring participant perception.

To better understand participant perception techniques, Guba and Lincoln (1981) provided four main groupings used by the researcher to consider in case study (pp. 133 and 371):

- "Chronicle" facts and events for interpretation.
- "Render" thick, rich description of participant voice.
- "Teach" as in communicating knowledge evidenced in participant personal or vicarious experience.
- "Test" credibility, through subjective evaluation, of a "contextual, holistic sense of the situation."

Bounded Case Study Design

This research used a bounded case study method (Yin, 1989; Stake, 1995; Creswell, 2008) as a qualitative exploration of participant experience. *Bounded*, as a descriptive term, means that the case is separated out for research in terms of time, place, or some physical boundaries" (Creswell, 2008, p. 476). Merriam (2002) described an interpretive qualitative approach to research as "interested in understanding what those interpretations are at a particular point in time and in a particular context (p. 4)." She added to this description with focus on "learning how individuals experience and interact with their social world, the meaning it has for them" (p. 4). Merriam (1998) cites Guba and Lincoln (1981) as she restated her own perspective on evaluation that "case study is best because it provides thick, description, is grounded, is holistic, and lifelike, simplifies data to be considered by the reader, illuminates meanings, and can communicate *tacit knowledge*" [emphasis added] (p. 39).

Stake (1995) described case study as the "study of the particularity and complexity of a single case, coming to understand its activity within important circumstances" (p. xi). Stake was clear in stating "case study research is not sampling research. We do not study a case primarily to understand other cases" (p. 4). He declared that "The real business of case study is particularization, not generalization" (1995, p. 8). The researcher retained this principle while interpreting information collected in the interviews with participants.

The highly personal nature of qualitative research was also accented by Stake (1995). The findings of the research "cannot help but be interpretative, and [the] descriptive report is laced with and followed by interpretation…[This] offers opportunity for readers to make their own interpretation of the case" (p. 134) by comparing and contrasting opinion with the researcher's interpretation. This aspect of interpretation suggested a continuum of meaning-making that will emerge after completion of this dissertation.

Design was shaped around the personal and interpersonal meaning-making of participants as they related their own experiences as experts of their personal experience. In this study, participants' comments were assessed and interpreted by the researcher in collaboration with participants and adult education peer experts. Notwithstanding, findings and recommendations were the sole responsibility of the researcher. See Figure 3.1 for the conceptual flow of this study.

Figure 3.1 Conceptual Flow of This Qualitative Case Study Sequence
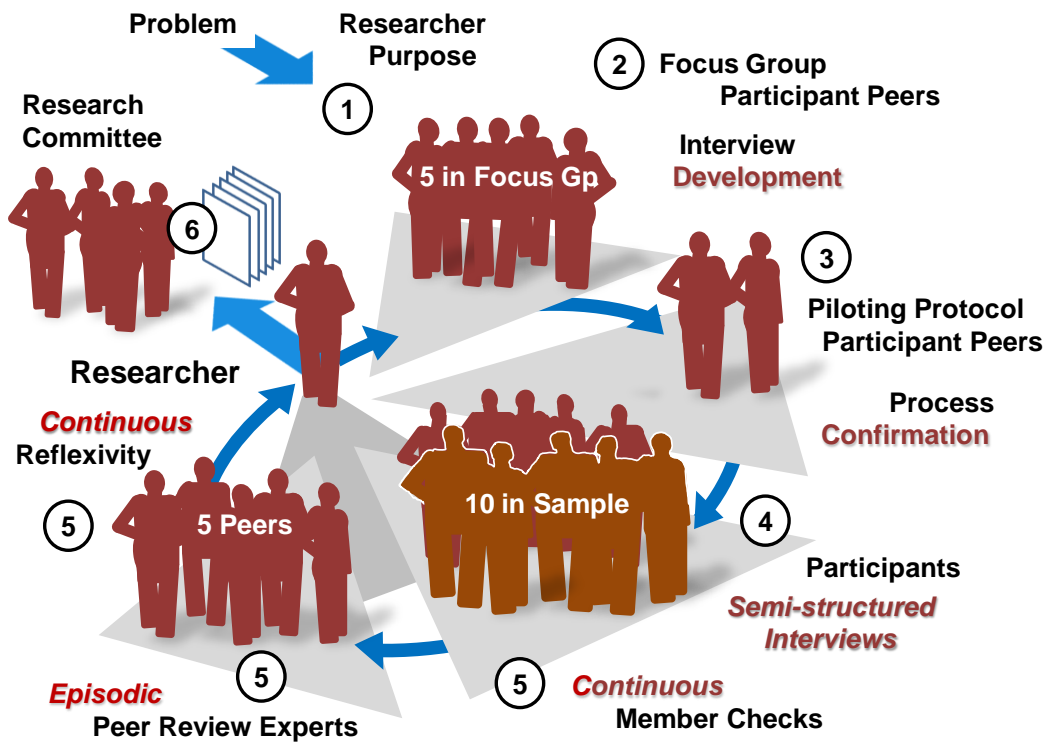
Figure 3.1. This illustration is a sequential flow through six main phases for qualitative exploration with a bounded case study methodology for this research. As adapted and applied from Creswell (2008), *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, Upper Saddle River, NJ: Pearson Education (3rd ed.), p. 52. Original art used by permission of Vykeen Haroldsson.

The qualitative design in this research remained flexible while retaining an inductive intent. In addition to flexibility, Patton (2002) stated that, "qualitative designs continue to be *emergent* [emphasis added by Patton] even after data collection begins" (p. 255). Process and procedure included viewpoints of Creswell (2008) and Mustakas (1994), complemented with characteristics of qualitative design by Patton (2002). These adjustments during the process were recorded as they happened and were points for reflection in the researcher's learning journal. Selected occurrences were discussed as part of the chapter 4 findings of this study.

Research Questions

Two research questions explored *how* [emphasis added] participants make meaning of their intuitive decisionmaking. Research questions that probed participants' perception or understanding of intuitive decisionmaking were as follows:

- What is a participant's perception on the phenomenon of intuitive decisionmaking?
- What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?

Qualitative Process Method

A method adapted and applied from Creswell (2008) provided structure to the qualitative process of this case study research as illustrated in Figure 3.2. The researcher identified the phenomenon of intuitive decisionmaking as worthy of doctoral research and coordinated with the major professor in framing the problem to be explored. Conducting a review of relevant literature indicated a valid purpose for this study and resulted in a proposal to the doctoral research committee comprised of four experts in adult education and educational leadership. Upon approval of adjustments emerging from the proposal defense meeting, the researcher conducted research and collected data. The researcher interpreted data and identified findings stated in Chapter 4. Reflection on findings identified several recommendations for future study by the researcher or other researchers as presented in Chapter 5.

This research was not intended to obtain a phenomenological outcome with an "essential, invariant structure (or essence) or the central underlying meaning of the experience" (Creswell, 1998, p. 52). However, Merriam and Brockett (1997) indicated that a phenomenological *perspective* [emphasis added] by the researcher can add to a way of thinking about adult education in its "feeling, consciousness, and experiences" (p. 42). Creswell noted a phenomenological perspective as seeking "the meaning of lived experiences for several individuals about a concept or the phenomenon" (p. 51). This research focused on the researcher's interpretation of intuitive situations as participants live their lives. Van Manen stated that the "nature of an experience has been adequately described in language if the description reawakens or shows us the lived quality and significance of the experience in a fuller or deeper meaning" (p. 10).

Figure 3.2 Research Organizational Flow: A Qualitative Process Model
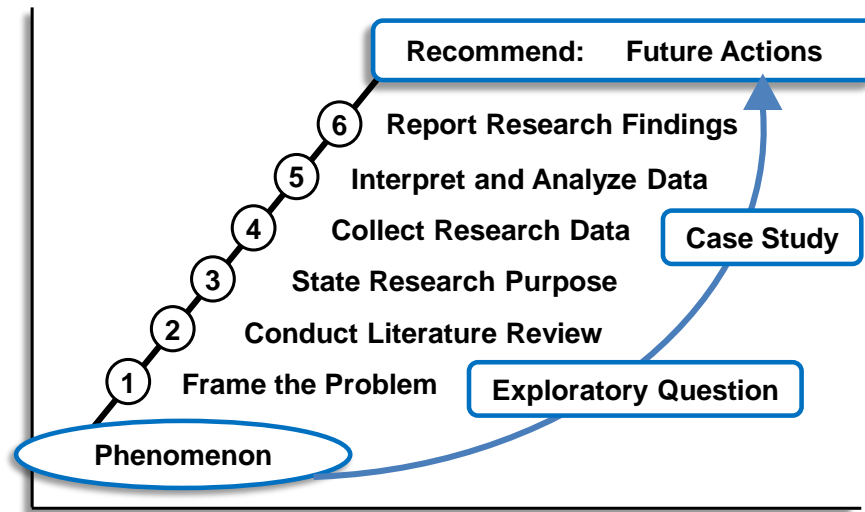
Figure 3.2. A qualitative process model. Adapted and applied from Creswell (2008), *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, Upper Saddle River, NJ: Pearson Education (3rd ed.), p. 52.

In this research, a bounded case study emphasized a qualitative quest to record and interpret the *thinking* of participants from the participants' perspectives (Fraenkel & Wallen (2006)). Collecting research data exemplified a researcher-to-participant, one-on-one, semi-structured verbal interview experience. This interview technique yielded considerable richness in detail on the personal meaning as expressed by participants. Collection and interpretation of verbal and nonverbal communication with participants was conducted in an inductive manner. Design retained an expectation "to be *emergent* [emphasis added by Patton]" (Patton, 2002. p. 255).

This naturalistic inquiry on intuitive decisionmaking recognized that qualitative study has the potential to yield "inevitable conclusions about what is important, dynamic, and pervasive in that field" (Guba & Lincoln, 1981, p. 55). Although the research questions used the adjective *what*, the researcher maintained a broader active listening to the voice of each participant. Booth, Colomb, and Williams (2008) accent the importance of research questions that attend to *who*, *what*, *when*, and *where* [emphasis added by Booth, Colomb, and Williams]. However, they recommended "focus on *how* and *why*" [emphasis added by Booth, Colomb, and Williams] (p. 41). The broader intent of the questions allowed the researcher to focus the recommendations for future near-term and long range qualitative exploration.

Population

In the monthly statistics published by the U.S. Department of Defense of active duty military personnel, the data as of January 31, 2011 in Table 3-1 records the number of U.S. Army, Navy, Air Force, and Marine Corps officers in the rank of major or its naval equivalent of lieutenant commander, and the rank of lieutenant colonel and its naval equivalent of commander (*Active Duty Military*, 2011).

Table 3.1 Officer: Major/Lieutenant Commander and Lieutenant Colonel/Commander

U.S. Active Duty Major/Lieutenant Commander and Lieutenant Colonel/Commander Populations

Rank-Title	Army	Navy	Marine Corps	Air Force	Total
Major/Lt Commander	17,010	10,368	3,910	14,625	45,813
Lt Colonel/Commander	9,763	6,889	1,930	10,122	28,704

Note 1. Abbreviation for *lieutenant* is Lt.
Note 2. These two groups of commissioned officers represent 74,517 of the 234,332 commissioned and warrant officers in the U.S. Department of Defense as of January 31, 2011.
Note 3. U.S. Department of Defense personnel statistics updates are available at http://siadapp.dmdc.osd.mil/

A readily available sample to consider for this research was U.S. Armed Forces officer students available and attending the Intermediate Level Education (ILE) course in 2011 at the U.S. Army Command and General Staff College (CGSC) at Fort Leavenworth, Kansas. This ILE course had 336 students enrolled from the U.S. Armed Forces, U.S. Federal interagency civilian midcareer leaders, and international military officers (M. Nichols, personal communication, March 14, 2011).

Participant Selection

A purposeful sample of volunteer participants was comprised of 10 U.S. Armed Forces officers. Merriam (1998) commented that a sample in qualitative research is "often nonrandom, purposeful, and small" (p.8).

The key characteristic for each participant was experience of at least one combat zone tour of duty such as Iraq or Afghanistan. Areas of operation designated as a combat zone were defined by the U.S. Federal Government. Of the Army officers attending Intermediate Level Education (ILE) course, about 94% had combat operations experience (T. Bruner, personal communication, June 15, 2011) and *CGSS 11-02* (2011).

The researcher used his professional judgment and domain expertise to select and use 10 volunteer participants. In focusing on a small purposeful sample at the ILE, the researcher recalled a comment by Creswell (2008): "The standard used in choosing participants and sites is whether they are 'information rich'" (p. 214). Creswell cited Patton (1990) in this regard. Patton (2002) reiterated this concept on "information-rich cases" for purposeful selection in order to study a central issue in depth (p. 230).

Most U.S. Army officers attending this ILE course were at a midcareer commissioned rank of *major.* Some officers attended this course with the rank of *lieutenant colonel*−the rank next senior above that of *major.* The researcher incorporated six U.S. Army majors, and two U.S. Army lieutenant colonels. Volunteers from other services of the U.S. Armed Forces were accepted with the expectation that they would complement an "information rich" experience. These participants were one U.S. Navy officer with the rank of *commander*, a naval rank equivalent to lieutenant colonel, and one major in the U. S. Air Force.

The U.S. Army majors and lieutenant colonels in the focus group, pilot interview group, and purposeful sample represented three categories of U.S. Army officer as follows: Active Component (AC) of the U.S. Army, Army Reserve (USAR), and Army National Guard (ARNG). Of the 336 officer students in ILE course 11-02, 216 officers were from the active component U.S. Army, 10 were members of the Army Reserve and 11 were in the Army National Guard. The U.S. Navy (USN) had 21 officers and the U.S. Marine Corps (USMC) had no representatives in this ILE. The U.S. Air Force (USAF) had 29 officer student attendees. (*CGSC-CGSS Service 11-02 (*2011)).

Other demographic data were collected as supplemental information to the primary selection criterion of combat experience and is included in the biographical sketches of each participant. Information included military rank, participant age, gender, race, marital status, level of civilian and military educational certification.

Each participant had served between 10 to 31 years of military service with leader experiences in a number of duties which ranged administrative, logistical, or specialized support positions in Army organizations, as well as company level command experience in Army organizations. Four of the participants had prior enlisted [soldier or noncommissioned officer] service in the U.S. Armed Forces. This skewed the average of the participant group for total time in service; however, this diversity in experiences was beneficial to the research.

Each participant identified his or her functional specialty, or what has been traditionally labeled as a "branch of Army service." These specialties were categorized in one of several "warfighting functions." These functions grouped in three main categories as follows: maneuver, fires, and effects (MFE); operational support (OS); and force sustainment (FS). These areas of expertise, such as the infantry, armor, or artillery in MFE; military intelligence or military police in OS; and quartermaster and other logistics in FS are indicative of their individual context in professional skills and experiences. These roles were commonly understood as combat oriented, combat support, or combat service support to combat operations. Some officers had commissions in special functions such as a chaplain, military lawyer, or medical corps officer.

The ten U.S. officers possessed the desired level of professional training, military education, and operational experiences for this research. They had lived or experienced vicarious knowledge or direct observation of events which required intuitive decisionmaking as integral to their career experiences, personal perceptions, and recollections.

Frankel and Wallen (2006) reminded that a sample is rarely, if ever, a perfect representation of a target or actual population. The researcher recognized that the purposeful sample would *not* be a representative sample of the available officers in the Intermediate Level Education (ILE) course at Fort Leavenworth, Kansas. However, participants volunteered from a particular group of officers in their ILE with the following demographics:

- 49% Maneuver, Fires, and Effects (MFE) functional area; 24% Force Sustainment (FS) functional area; 18% Operational Support (OS) functional area; and 9% Special Branch functional area.
- Male. 87%.
- Female. 13%.
- Race. The Command and General Staff College (CGSC) did not record race categories as specifically listed in the 2011 U.S. Census. Nonetheless, the researcher interpreted available CGSC data for the ILE course 11-02 as follows: 80% White; 11% Black or African American; 5% "Asian/Pacific" as recorded by the Command and General Staff School (CGSS); 4% Some Other Race, that is, "Hispanic" as recorded by CGSS. One individual was categorized as "Indian" by CGSS.
- Marital status: 88% married; 12% single.

Guba and Lincoln (1981) cautioned any attempt to generalize with qualitative data. The multiple interactions affecting any phenomenon were complex and "can have meaning only in the actual situation in which it occurred" (p. 116). This purposeful sample was not assumed to be representative of common cognitive processes of a contemporary U.S. Army major. This research could not be generalized to a larger U.S. Army officer population even if participants' personal reflections and expressions indicated similarities or convergence. However, their perceptions were of value in qualitative inquiry to understanding intuitive decisionmaking.

Focus Group

A group of five U.S. Army majors comprised the focus group and were volunteers from the Command and General Staff College (CGSC). These officers had experienced at least one combat zone tour of duty. The majors had each experienced between one and three tours of duty in a combat theater. Total time in a combat theater of operations for an officer ranged from one to three years.

The officer commissions were in varied functional areas. These areas of expertise were: engineer; aviation, judge advocate general [Army lawyer], adjutant general [personnel and administration], and Army chaplain. The sources of the Army officer commissions spanned:

- Professional branches of the Army such as the Judge Advocate General Corps and the Army Chaplain Corps where civilian degreed leaders can receive a direct commission in their career field.
- Officer Candidate School (OCS) where soldiers attend basic military training followed by an additional officer candidate school.
- Reserve Officers Training Corps (ROTC) at a civilian university.

The average time of military service was 13.5 years. However, two officers had extensive time as soldiers and noncommissioned officers before obtaining an officer's commission. At the time of the 2011 interviews, one officer had 24.5 years of military service, and another officer had 24 years of military service. They had received their commissions in 1996 and 2000 respectively as Army officers.

Other demographics provided a perspective of these officers which include the following: four males and one female; four married and one single; and all five were white. Definition of race was as defined as in the 2010 U.S. Census. Level of formal education and degrees were two

masters of science (MS), one bachelors of science (BS), one masters in business administration (MBA), and one juris doctor (JD) as a graduate degree in law.

These five individuals were not intended to be participants in the subsequent pilot interview or the purposeful sample. However, one of the officers offered and was accepted to continue in the purposeful sample group based on his personal experiences and keen interest in intuitive decisionmaking.

The interpretation of focus group comments indicated a credible interview protocol, and suggested that the semi-structured interview questions required minor adjustments and several additional questions in order to explore new aspects to consider during the research process. A facilitated dialogue among these participants by the researcher indicated their level of understanding on intuitive decisionmaking. The focus group served at least two main purposes: (1) gathered candid data on the participants' perception of intuitive decisionmaking, and (2) obtained comments on interview process, construction of the interview questions, and clarity of understanding question intent.

The conduct of the focus group was explained clearly to the focus group by the researcher. Immediate feedback from focus group participants acknowledged a common expectation for the informal group session. Elements of the group dialogue included a concise overview and introduction of the research project, the objectives of the focus group session, and guidelines and confidentiality for focus group interaction. The concept of an open-ended discussion as a small group provided an opportunity for each focus group participant to listen to other participant's opinions, assess personal understanding, and comment on the phenomenon to qualify or adapt their own understanding on perception of intuitive decisionmaking.

The researcher was attentive to interpersonal power dynamics that might emerge in such a small group and encouraged active dialogue by all participants. Described by Berg (2007) as "an active listening facilitator," the researcher guarded against offering personal opinion or substantive comments that might stifle candid focus group dialogue. Berg suggested that an effective focus group dialogue is about 90 percent participant driven and about 10 percent researcher oriented (pp. 158-159). The researcher conducted the focus group with this dynamic.

The first voluntary response from a group member was encouraging for future exploration. During the focus group introduction, Andy [pseudonym] said, "I guess my first thought when thinking about intuitive decisionmaking−you know−you're making a decision

without conscious thought." He quickly followed this statement with another insight. "It could be based on experience. It could be based on just habit. Instinct. I guess you could even tie-in moral aspects."

The interview questions proposed for the purposeful sample framed the group discussion. Deciding how many questions were appropriate beyond a central question was a researcher responsibility. A central issue was described by Creswell (2008) as "the overarching question being asked in a qualitative study," and sub-questions in the interview protocol "refine the central question into subtopics" (pp. 637 and 647). This topic of refining the number of interview questions kept group discussion focused for later interpretation and consideration on improved quality of exploration in the research project. Given that the questions of the semi-structured interview were the central means of exploring the perception of intuitive decisionmaking, focus group feedback shaped the semi-structured interview protocol. The feedback from participants indicated the following:

- The interview protocol was understandable.
- The issue of intuitive decisionmaking was worthy of additional research.
- The outcome of the research would be useful in their professional development.

From an initial list of 18 questions, several additional areas of interest emerged as important based on participant comments. Questions that were refined or added to the basic semi-structured interview questionnaire were as follows:

- How would you describe intuitive decisionmaking in one word?
- What relationship does critical thinking have with intuition?
- How does creative thinking relate to intuition?
- How would you relate "inquisitiveness" to creative thinking?
- What personal value do you place on your intuitive decisionmaking abilities?

This preliminary exploration also concentrated on the open-endedness, emergence, and neutrality of language. Based on the researcher's reflection on dialogue and insights among focus group participants of perception on intuitive decisionmaking, an expanded yet open-ended interview protocol was used with the pilot interview group and the purposeful sample.

Piloting Interview Techniques Group

Two U.S. Army majors were participants in the pilot interview with the intention to refine protocol techniques to be used with the purposeful sample. These two participants were not members from the focus group or the subsequent main research group of purposeful sample participants.

The demographics of this pilot interview group were one officer with one year in a combat theater of operations, and the other officer with two years in a combat theater during three deployments. The earliest deployment of this officer was during Operation Desert Shield/Desert Storm—the First Gulf War (1990-1991).

The active component Army officer was a chaplain in the Army Chaplain Corps, and the other officer was a field artillery officer in the Army National Guard (ARNG). One officer was female and one officer was male. One officer was married and the other officer was single. Both officers were white. The length of military service was 22.5 years for the chaplain with over five of those years as a soldier and noncommissioned officer before obtaining a direct commission in 1994. The artillery officer received his commission through the Reserve Officers Training Corps at a civilian university and had 12 years experience of military service.

These two officers illustrated the diversity of experience that existed within the midcareer population of U.S. Army officers at the Intermediate Level Education (ILE) course. Their dialogue expressed two distinct approaches on how they had internalized the concept of intuitive decisionmaking.

The piloting of interview questions and techniques was conducted with the two participants in one interview session with the researcher. During the pilot interview process, the researcher assessed if a question evoked the desired descriptive detail or insight from a participant. Bradburn, Sudman, and Wansink (2004) cited Beslon (1968) on the importance of pretesting questions. Beslon suggested a researcher ask a participant to restate the question in their own words to indicate if mutual understanding has been achieved. This technique was used in the pilot interview process. Another technique offered was to have a participant verbalize thought processes as the participant formulates an answer to the question. The researcher prompted this during the interview with a simple question and statement, "What are thinking right now? Tell me what thoughts are forming as you prepare to answer."

The first response came from Alex [pseudonym] who emphasized experience. He said:

For me, intuitive decisionmaking is—you learn in doctrine—that you have the art of command and the science of command and obviously the intuitive piece is more the art of command. And I think, for me, a lot of it comes from experience. It comes with confidence. I think the more experience you have and the more confidence you have, your experience and your abilities—I think— you're more probably more confident that your intuition will be accurate.

Mary [pseudonym] had a different approach in her first response. She appeared to struggle with how to describe her personal perception of intuition and decisionmaking. Mary agreed experience was important, and added training. She noted that education was key to informal and formal experience. Later in the interview she introduced an aspect very important to her. She said:

I feel like—I feel like—I feel like intuition falls in to the *spiritual*. It would be hard to 'slice with an X-Acto ® knife' between when I have a sense, or a 'gut feeling'—and when I feel like I'm being spiritually led to do something. So, I'm not sure. I'll probably be an outlier in your study. I don't know.

Interview techniques allowed for additional questions by the participant or the researcher to clarify or expand on a participant response. At times, the researcher provided an example or vignette to establish context to a question. Oral prompts, when used by the researcher, aided some recall by the participants. The researcher was mindful that aided recall could possibly limit the participant's cognitive reflection for personal incidents that could answer a question. Results from piloting protocol techniques and feedback of the two participants provided researcher confidence for modifications on the initial research interview protocol. Another key observation was to be very attentive to each participant with active listening and an empathetic attitude as they expressed their story. This vicarious experience of the researcher provided an improved subjective appreciation of participant perception or understanding in the subsequent interviewing of participants of the purposeful sample.

An exploratory perspective gleaned insights from a five-participant focus group and experiences obtained from a pilot interview protocol techniques with two peers of the purposeful sample participants. These actions sensitized the researcher to more effectively interpret the

voiced experiences of participants in the subsequent primary research group─the purposeful sample─and the opinions of researcher peer expert reviews, and the researcher's own reflexivity throughout the research of the phenomenon.

Creswell (1998) emphasized the value of a perspective that seeks to elicit how individuals make meaning of their lived experiences about a concept or phenomenon. This research focused on the researcher's interpretation of intuitive situations as participants expressed living their lives. Merriam (2002) stated a similar qualitative perspective: "The key to understanding qualitative research lies with the idea that meaning is socially constructed by individuals in interaction with their world" (p. 3).

Exploration of situational context and trigger-event understanding probed the personal perception of lived or vicarious experiences by participants. Each interview confirmed the individual nature of perceiving intuitive decisionmaking. Guba and Lincoln (1981) posited an insightful qualitative viewpoint that affected the researcher's inductive reasoning and interpretation of data. They stated that tacit and propositional knowledge functions *simultaneously* for the naturalistic inquirer, and that "…until we understand more about the functions of the brain, we shall simply go on 'understanding' that we somehow 'knew' something of which we were not consciously aware" (p. 135).

Purposeful Sample

The ten officers comprising the purposeful sample were eight U.S. Army officers, one U. S. Navy officer, and one U. S. Air Force officer. The researcher coordinated with the Command and General Staff School (CGSS) of the CGSC for ten volunteers from its ILE course with a principle requirement of having had at least one combat tour of duty. The demographics of the purposeful sample in Table 3.2 represented functional expertise spanning a wide range of profession experiences.

Eight officers had experienced two to four tours of duty in a combat theater. One Army officer had experienced four combat tours. The seven tours of the Air Force officer were due to the shorter but more frequent deployment periods in normal Air Force deployment cycles to a combat theater. Total time deployed in a combat theater for participants spanned from one year to three and one-half years, with the average for these ten officers being two years.

Table 3.2 Demographics Summary of Purposeful Sample

Purposeful Sample Demographics Summary

Pseud	Rick	Tom	John	BK	Karl	Max	Sam	Gene	Jay	Bruce
Rank	CMDR	LTC	MAJ	LTC	MAJ	MAJ	MAJ	MAJ	MAJ	MAJ
Svc	USN	USA	USA	USA	USA	USA	USAF	USA	USA	USA
Age	46	39	34	48	43	40	52	36	38	36
ACRC	RC	AC	AC	AC	AC	RC	AC	AC	AC	AC
TIS	23.5	19	13	16	23.5	22	31	14	10	13
Enl	0	2	0	5.5	0	8	14	0	0	0
Entry	1987	1989	1998	1984	1987	1989	1976	1997	1995	1998
Com	1988	1994	1998	1991	1999	1997	1997	1997	1995	1998
Src	OCS	ROTC	ROTC	OCS	OCS	ROTC	Dir	ROTC	ROTC	USMA
Br	Supply	MI	LOG	JAG	AR	LOG	Space	AV	AR	IN
CbtX	2	2	3	3	2	2	7[a]	3	4	2

Note. The left-hand column uses the abbreviations as follows:
Pseud: Pseudonym of the participant.
Rank: CMDR: Commander [naval rank equivalent to LTC]; LTC: Lieutenant Colonel; MAJ: Major.
Svc: Service in U.S. Armed Forces: USN: Navy; USA: Army; USAF: Air Force.
ACRC: Active Component (AC) or Reserve Component (RC).
TIS: Time in Service.
Enl: Enlisted U.S. Armed Forces [time in service].
Entry: Entry date in U.S. Armed Forces.
Com: Year of officer commission.
Src: Source of commission: OCS: Officer Candidate School; ROTC: Reserve Officers Training Corps;
   Dir: Direct Commission; USMA: United States Military Academy.
Br: Branch: MI: Military Intelligence; LOG: Logistics; JAG: Judge Advocate General's Corps; AR: Armor;
   Space: [USAF-electronic warfare expertise]; AV: Aviation; IN: Infantry.
CbtX: Tours of duty in a combat theater.
[a] The U.S. Air Force data is not used to compute the research *average* of combat tours in this research because the U.S. Air Force directs shorter tours of duty in their deployment cycles that may be six or more months for one deployment. The U.S. Army uses a period of time that may be one year or more for a deployment.

For the Army officers, their branches of service expertise were: infantry, armor, aviation, military intelligence, judge advocate general corps [military lawyer], and logistics. The U.S. Navy officer was a naval logistician and the U.S. Force officer was an electronic warfare expert.

As of 2011, two officers had earned a masters in business administration (MBA); one officer had a juris doctor (JD) graduate degree as a military lawyer; two officers had master of arts (MA) degrees; one officer had a bachelor of arts degree; and three officers had bachelor of science (BA) degrees.

The sources of officer commissions varied. Five of the ten commissions were from the Reserve Officers Training Corps (ROTC); three from Officer Candidate School (OCS); one direct commission; and one commission from the United States Military Academy at West Point, New York (USMA). The average year of commission was 1995. The officer ranks at the time of interviews were seven majors, one naval commander [U.S. Navy equivalent of lieutenant colonel], and two lieutenant colonels. Eight officers were serving in the active component Army and Air Force, one officer was in the Army Reserve, and one officer was in the Naval Reserve.

The youngest officer was 34 years old and the oldest officer was 52 years old. Without these youngest and oldest data in age, the average age of the purposeful group was 41 years old. Using all ten ages averaged just over 41 years of age.

The average time of military service was 18.5 years. The least time in military service was ten years for one officer, and the most years in military service for one officer was 31 years. Some officers had extensive time as soldiers and noncommissioned officers before obtaining their officer commission. At the time of the 2011 interviews, one officer with 22 years of military service had eight years of that period as a soldier and noncommissioned officer, and the officer with 31 years of service included 14 years as an airman and noncommissioned officer. Both of these officers received commissions in 1997. Other soldier and noncommissioned officer experience included one officer with two years and one officer with five and one-half years of duty. The average time as a commissioned officer for these ten participants was 15.5 years.

Other demographics provided a perspective of these officers which include the following: ten males; eight were married and two were single; and seven participants were white. Two officers were Asian, and one identified himself as "some other race." As defined in the 2010 U.S. Census, this particular familial lineage of "some other race" was Asian and White.

The researcher estimated that ten participants was an adequate number in order to provide diversity of information and the ability to identify patterns and complexity concerning the phenomenon (Creswell, 1998; Creswell, 2008). By about the sixth or seventh interview, the researcher interpreted that saturation had been achieved. All ten officers were interviewed to add more depth to data collection and explore for additional and different information. The interpretation identified no significantly different information. This group of experts in their professional military domains offered an exploratory venue that "describe[d] the lived experiences for several individuals about the concept or phenomenon [of intuitive decisionmaking] (Creswell, 1998, p.51). Fraenkel and Wallen (2006) defined a purposeful sample as, "A nonrandom sample selected because prior knowledge [of the researcher] suggests that it is representative, or because those selected have the needed information" (G-6).

Descriptions of intuitive decisionmaking by the participants suggested a divergent ability to articulate what they perceived or understood as occurring during the act of intuitive decisionmaking. Notwithstanding the possibility of an intangible aura, a crucial issue of this research was to relate how a participant described his or her meaning-making of intuition. Mustakas (1994) alluded that meaning itself may be intuitive or be "reflection on conscious acts of experience, leading to ideas, concepts, judgments, and understandings" (p. 58).

Biographical Sketches of 10 Participants

The ten participants in the purposeful sample exhibited a wide range of professional experiences. A concise biographical sketch of each officer illustrates the richness and diversity among their personal enterprises and domains of expertise.

Gene

Gene was a U.S. Army officer with the rank of major. He was 36 years old and had served in the U.S. Army for 14 years. He was commissioned in 1998 from the Reserve Officers Training Corps (ROTC) program at a civilian university. He received aviation as a branch specialty. During the last 10 years, he had experienced three deployments with 24 months in a combat theater of operations. Recent military duties included being a helicopter pilot and company commander in Iraq, combat advisor in Iraq; plans officer in an operations staff section at a United States installation and Mission Command Center of Excellence (CoE) commanded

by a lieutenant general; and observer/controller (trainer) at one of the U.S. Army's Combat Training Centers (CTC) in the United States.

Rick

Rick was a U.S. Navy Reserve (USNR) officer with the rank of commander. This rank is equivalent to the Army rank of lieutenant colonel. He was 46 years old and had served in the U.S. Navy for almost 24 years. He entered military service in 1987 as a sailor and earned an officer's commission through the Navy's Officer Candidate School (OCS) in 1988. During the last 10 years, he had experienced 9 months in a combat theater and had deployed twice on tours of duty. His primary military duties during this period included contracting officer and administration officer in stations in the United States.

John

John was a U.S. Army officer with the rank of major. He was 34 years old and had served in the U.S. Army for 13 years. He earned an officer commission in 1998 from the Reserve Officers Training Corps (ROTC) program at a civilian university and received a branch specialty of logistics. During the last 10 years, he had been on four deployments and experienced 42 months in a combat theater of operations during three tours of duty. Recent military duties included brigade logistics officer in Afghanistan; brigade security, plans, and operations (SPO) officer in Afghanistan; and forward support company commander in Afghanistan.

Max

Max was a major in the U.S. Army Reserve (USAR). He was 40 years old and had served in the U.S. Army for 22 years. Entering the Army in 1989, he was a soldier and noncommissioned officer (NCO) for eight years before earning his officer commission in 1997 from the Reserve Officers Training Program (ROTC) program at a civilian university. His branch specialty was logistics. During the last 10 years, he had experienced two deployments with 23 months in a combat theater of operations. Recent military duties included operations officer of a logistics unit, plans officer in a regional support group (RSG) in the United States, and commander of a quartermaster [logistics] company in the United States.

Sam

Sam was a major in the U.S. Air Force, and had served for 31 years with 14 of those years as a soldier and noncommissioned officer (NCO). He entered military service in 1976, and received a direct commission in an air force branch specialty of space. During the last 10 years, he had experienced seven deployments with 15 months of those deployments in a combat zone theater of operations. Recent military duties included chief of an electronic warfare (EW) section and chief of an information operations (IO) section at an air force base in the United States, and electronic warfare (EW) plans officer in a senior level Army headquarters in Iraq.

Bruce

Bruce was a major in the U.S. Army and had been an officer for 13 years. He was 36 years old and was commissioned as an infantry officer in 1998 from the United States Military Academy (USMA). He had experienced 22 months in a combat theater of operations during two deployments in the last 10 years. Recent military duties included being a member of a U.S. Army security training team to Iraqi security forces, instructor at a U.S. Army military college, and student at a civilian university in the United States where he earned a Master of Arts graduate degree.

Jay

Jay was a major in the U.S. Army and had been an officer for 10 years. He was 38 years old and was commissioned as an Armor officer in 1995 from the Reserve Officers Training Corps (ROTC) program of a university. He had experienced 32 months in a combat theater during four tour deployments in the last 10 years. Recent military duties included being a member of a U.S. Army security training team to Iraqi security forces, a contracting officer for a brigade combat team (BCT) in Iraq, and a training officer in a brigade stationed in the United States.

Karl

Karl was a U.S. Army officer with the rank of major. He was 43 years old and had served in the U.S. Army for 24 years. He earned an officer commission in 1999 from the Officers Candidate School (OCS) program and had a branch specialty of armor. During the last 10 years, he had been on two deployments and experienced 24 months in a combat theater of operations. Recent military duties included rear detachment commander at a United States installation while most of

his unit deployed overseas; command of a headquarters and headquarters company at a United States installation, and as an executive officer and operations officer in a unit deployed to Iraq.

BK

BK was a lieutenant colonel in the U.S. Army and was 48 years old. He entered the Army in 1984 and was a soldier and noncommissioned officer for almost six years. He earned an officer commission in 1991 from the Officer Candidate School (OCS) program. His branch specialty was a military lawyer in the Judge Advocate General Corps (JAG). He experienced 22 months in a combat theater of operations during three deployments in the last 10 years. Recent military duties included observer/controller [trainer] for the Army's Mission Command Training Program (MCTP), which was formerly titled the Battle Command Training Program (BCTP); a brigade judge advocate at a United States installation; and student at the Army's Judge Advocate General Corps School.

Tom

Tom was a lieutenant colonel in the U.S. Army, and had served for 19 years with two of those years as a soldier. He received his officer commission in 1994 from the Reserve Officers Training Corps (ROTC) program at a civilian university. He had a branch specialty of military intelligence. He had experienced 27 months in a combat theater of operations during two deployments in the last 10 years. Recent military duties included deputy intelligence officer for an Army division, intelligence plans officer for an Army division, and executive officer for a military intelligence battalion.

Role of the Researcher

The researcher acted as the primary instrument to collect and analyze data inductively in order to better understand intuitive decisionmaking as perceived by participants. In *Effective Evaluation,* Guba and Lincoln (1981) spotlighted the significant value of the researcher as the qualitative research instrument−a human instrument. Merriam (1998) noted that a researcher must possess particular characteristics to conduct an effective qualitative inquiry. Desired characteristics of a researcher included a willingness and ability to accept ambiguity, sensitivity with an intuitive perception, appreciation of varied worldviews and values, and an empathetic manner in oral communication and somatic signals.

A complementary requirement was the researcher's attentiveness for the potential of researcher perspective or misunderstood context in recording participants' thoughts and recollections. Bogdan and Bilken (1992) noted that "the researcher's primary goal is to add to knowledge, not to pass judgment on a setting" (p. 46). They accented that a "qualitative researcher's goal is to better *understand* [emphasis added by Bogdan and Bilken] human behavior and experience (p. 49). The researcher reflected regularly on these desired characteristics throughout the research.

Another critical talent for a researcher was to write and illustrate effectively in field notes, reflective journals, and research interpretation. The researcher in this study demonstrated the ability to effectively communicate in published professional articles, papers, handbooks, studies, and contemporary professional association forums during a 30 year career in the U.S. Army as a commissioned officer, and in a current career as a military analyst and adult educator. (Moilanen, 1991, 1993, 1995, 1997, 1998a, 1998b, 1998c, 2000, 2002, 2004, 2006, 2007, 2008, 2010a, 2010b). Several years of participation and presentations by the researcher at professional adult education forums included annual meetings as follows:

- American Association for Adult and Continuing Education (AAACE) (Fishback, S. J., Moilanen, J., Smith, K. & Peck, L., 2009).
- American Association for Adult and Continuing Education (AAACE) (Moilanen, J., Fishback, S. J., Persyn, J., Leslie, B., Brown, N., Peck, L.,…Lombard, D., 2010).
- Adult Education Research Conference (AERC) (Leslie & Moilanen, 2010).
- American Association for Adult and Continuing Education (AAACE) (Moilanen & Leslie, 2011).

Creswell (2008) recommended that a researcher relate an investigative approach that appreciates the researcher's personal experiences and training. He amplified that, "qualitative researchers need experience in field studies in which they practice gathering information in a setting and learn the skills of observing or interviewing individuals" (p. 63). The researcher had participated in numerous field study projects of observing, interviewing, and evaluating Army officers in operational settings; praxis in undergraduate and graduate level professional military education programs; and operational environments during the last 35 years.

In this research, a value of case study for the researcher was the ability to observe and study himself during the research. Patton (2002) commented on reflexivity and self-reflection: "Indeed, critical self-reflection and self-knowledge, and the willingness to consider how who one is affects what one is able to observe, hear, and understand" (p. 299). He summarized his statement as "an important phase and a commitment of growing significance as reflexivity has emerged as a central theme in qualitative inquiry" (p. 301). Schön (1987) accented the importance of self reflection as a complement to better understanding intuition, or as he states this phenomenon, "reflection-*in*-action" (p. 22).

The researcher explored his own experiences. This recurring introspection, applied candidly, was intent on minimizing the influence of known personal assumptions and preferences that might otherwise taint research interpretation. One example was the significant difference in some of the participant's military experiences from that of the researcher. These differences dispelled the notion that the officers would describe a definition of intuitive decisionmaking similar to the definition in U.S. Army doctrine.

Experience was another critical element for adult learning that required pertinent means to gain effective personal feedback. One technique used was reflective judgment posed by King and Kitchener (1994). The quest was to probe beyond simple knowledge retrieval in order to answer "how it is they [participants] come to know; an awareness of the reasoning, assumptions, evidence, and justifications that underlie that something is true" (Brookfield, 1995, para. 11). Adult learning for this qualitative research "provide[d] an opportunity to gain confidence in one's own judgment, but also a degree of humility as well" (Barnes, Christensen & Hansen, 1994, p. 41). The researcher applied critical reflection (Brookfield, 1987, 1990, 1995) to promote personal understanding by challenging personal assumptions and assessing an issue from multiple perspectives.

Throughout the research, the researcher collaborated with participants to express a credible personal "restory" as expressed by the participant (Creswell, 2008, p. 519). The researcher identified themes developed inductively from qualitative coding and thematic grouping of participants' stories. Research findings emerged from interpretive evidence of meaning-making on the perception of intuitive decisionmaking, as understood and described by participants. Researcher interpretation, triangulated with assessments from peer expert reviewers

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and participants, validated the qualitative authenticity, that is, the trustworthiness of research findings from the participants' intuitive decisionmaking experiences.

Mustakas (1994) commented on an exploratory manner that combines researcher and participant self-inquiry and dialogue. He accented that "the deepest currents of meaning and knowledge take place within the individual through one's senses, perceptions, beliefs, and judgments" (p. 18). Furthermore, Mustakas said, "*perception* is regarded as the primary source of knowledge, the source that cannot be doubted" (p. 52). In this regard, the researcher in this study believed perception to be a true personal awareness of a phenomenon.

The researcher also maintained an awareness of susceptibility to personal preferences. Patton (2002) cautioned that "the researcher is part of the context for the findings" (p. 64), and that the researcher "presents data about the effects of fieldwork on the setting and people therein and also the observer's [researcher's] perspective on what has occurred" (p. 328). The researcher's reflexivity considered his own worldview and was "conscious of the cultural, political, social, linguistic, and ideological origins of one's own perspective and voice" (p. 65).

Data Collection

Creswell (2008) listed five steps to collecting qualitative data. The first and second steps identified the participants and a location of the study. Third, the researcher obtained approval for access to the participants and site. Fourth, he determined what data needs to be collected and how the data will be collected. Then, the researcher conducted the qualitative study in an ethical manner.

A memorandum of introduction was presented to volunteers and further explained to each volunteer participant by the researcher prior to conducting the interview. (Appendix A - Memorandum of Introduction). The memorandum described the research topic and the researcher's intended use of findings and recommendations.

For those individuals who volunteered to participate in the study, the researcher requested selected demographic information and coordinated agreement to participate with an informed consent memorandum signed by each participant (Appendix B - KSU Informed Consent and Confidentiality Memorandum). Aspects such as ethical safeguards, confidentiality of information, ownership of the research and dissertation by the researcher, and researcher intention to use research data for publication was explicitly explained in the memorandum.

Each participant signed a copy of the informed consent memorandum, and was provided with a copy for their personal records. The researcher retained the signed original memorandum and enclosures.

The researcher's process gained insight and fidelity of data collection during each interview sequence with a focus group, pilot interview with two participants, and oral interviews with a purposeful sampling for research. Research data used a semi-structured interview process in a relaxed physical setting. Interviews were audio recorded with a digital recorder. An audio tape recorder was used simultaneously as a secondary means to record interviews.

Although varied computer-based tools exist for use with case study method (Hill, Kim, Zbylut, Gordon, Ward & Vowels, C. L., 2008), the researcher collected and interpreted data in this case study with recurrent reading of transcripts, consideration of peer expert reviews, and interpretation of comments from participants. The human connection between researcher and each participant sought to assess comments adaptively and empathetically in order to develop a credible subjective knowledge of how participants perceived and understood their intuitive decisionmaking.

Interview Process

Open-ended questions in a semi-structured face-to-face individual interview structured the primary research protocol of this case study. Shaped by review of professional literature and insights during the focus group and piloting of interview techniques, interview research remained an emergent venture throughout the study.

Exploration of situational context and understanding probed the personal perception of lived or vicarious experiences by participants. Each interview confirmed the individual nature of perceiving intuitive decisionmaking.

Attending to aspects of variation among participants was critical to understanding an individual "insider perspective" (Merriam, 1998, pp. 6-7) as meaning constructed and expressed by the participant in their own experience. Van Manen (1990) suggested that a search for making meaning can be lived and eventually recalled through cognition, bodily sensation, time conception, and interpersonal communication. Even then, the essence of intuitive decisionmaking may remain equivocal for the participant and the researcher. The researcher was responsible and accountable for establishing the trustworthiness of the research, findings, and recommendations.

Interview Setting

Interviews were conducted in a modern classroom location within the college campus. The college point of contact coordinated the classroom based on feedback from previous officer interview projects as the most convenient location for the participants. In two instances, follow-on interviews occurred at the college's open-air courtyard. The interview dates and times were coordinated for the convenience of the participants' schedules.

The arrangement of the interview room minimized any visual distractions. The room temperature was monitored for a comfortable setting. Bottled water was available for the participant as provided by the researcher. Positioning a primary and secondary recording device ensured effective audio recording without being a distraction to candid face-to-face conversation. See (Appendix C – Interview Location Diagram) for the interview room layout.

The participants volunteered for up to one hour interviews. The researcher provided a comfortable social setting for interviews that usually took between 35 to 45 minutes in duration. The outlier time durations were one interview of 27 minutes and one interview of 51 minutes. During preliminary greetings between the researcher and the participant, the researcher stated that the estimated interview time would not be longer than one hour. The researcher remained flexible to the participant's manner of conversation and answering questions.

The researcher ensured that participant comments and quotes were attributed to coded names to protect the confidentiality of transcribed audiotapes of all interviews. Field notes by the researcher during an interview were an effective aid in spotlighting key comments and quotes that were later cross-referenced to transcripts and audiotapes. (Berg, 2007) notes that field notes provide the researcher with an opportunity in "learning how respondents [participants] talk about the phenomenon…interpreting previously obtained qualitative results" (p. 145). A reflective learning journal, used in conjunction with field notes, was a critical resource in the researcher's constant comparison of narratives and observations.

Interview Conduct

A semi-structured interview was conducted with a purposeful sampling as an individual exchange between the researcher and a participant. The interview promoted a consistent experience for each participant. Nonetheless, flexibility existed for the researcher to probe a participant for clarity and understanding on any particular interview question. Although the

interview protocol was planned for using a standardized list of questions, perspectives previously not considered by the researcher emerged as a result of participant comments. One example was a participant who shaped the conversation with his fundamental outlook on life and death through a strong faith system reflecting values, morals, and professional ethics. The interview process evolved as each interview added to researcher's information and experience. The researcher determined when adjustments to the interview protocol were required, and made appropriate changes during the research process. The interview questions are at (Appendix D - Interview Questions Protocol).

Some participant's comments and quotes were attributed to code words during an interview or were noted verbatim to capture the impact of the moment. The researcher recorded hand-written notes during the interviews as an observational protocol. Listening and re-listening to audiotapes sometimes revealed a key phrase or connection among narrative sections that were not as apparent during an interview. If a more effective way emerged of how to present an issue or question in an interview, the researcher documented a rationale for change and incorporated subsequent insights into the semi-structured interview protocol.

A funneling technique was used to introduce the research topic, primary questions, and develop the interview dialogue. The questions with least restriction were asked first to prevent questions early in the sequence from overly influencing a response to a question later in the interview. The researcher used an interview protocol adapted and applied from Creswell (2008) to ensure a standard way of stating "instructions for the process of the interview, the questions to be asked, and space to take notes" (p. 233). The interview protocol−a list of questions with a branch point to explore either personal or vicarious experiences of a participant− fostered smooth transitions, and signaled when comparing or contrasting audio recordings and transcriptions of each interview.

The researcher repeated a question or requested additional comment from a participant if a response seems irrelevant or ambiguous to a specific question (Bradburn, Sudman, and Wansink, 2004). However, the researcher was careful to not comment on a participant response that might indicate a researcher expectation or suggestion of a preferred opinion.

Participants often responded to questions with "thick, rich" personal phrases. These comments transformed abstract concepts into a more discernible illumination of personal intuition, its meaning, and its application in a participant's decisionmaking. Merriam (2002)

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suggested that "colorful description in a case study can create an image" (p. 179) that will arise different meaning to different readers of a case and encourage a shaping and reconstructing of meaning that will be personally useful. This projection of image and language may actually be a reflection on personal lived experience or the projection of experience that could occur in particular circumstances.

At the conclusion of each interview, the researcher asked the participant if any questions or issues remained that the participant would like to volunteer as part of the interview. This concept used Houle's (1961/1993) reflection on his norm of concluding an interview by asking a participant if the interview setting had been comfortable, and if any additional thoughts should be added to the interview. The researcher expressed sincere appreciation to each participant for participation, outlined subsequent researcher actions with the participant, and estimated when evolving and final feedback would be provided to each participant. Each participant was provided with a concluding oral reflection of the interview process by the researcher. Based on suggestions by the researcher's faculty committee, (Appendix E – Interview Protocol and Rationale) provided a supporting rationale of relevant literature for this particular interview protocol.

Interview Audio Record and Transcription

Each interview was audio recorded. The researcher contracted with a transcriptionist. She signed a confidentiality agreement with the researcher, and transcribed six of the ten purposeful sample interviews. The researcher transcribed focus group interview, pilot interview, and four of the purposeful sample interviews.

The researcher compared transcriptions with the original audio recording to confirm the accuracy of the transcription process. Any clarifications offered by a participant in follow-on interviews were annotated by the researcher to the transcription record as an addendum to the actual interview. For example, a participant added details to an intuitive experience during a combat mission. The participant offered possibilities of what might have caused him to make a momentary intuitive decision, but remained unsure what exactly prompted the decision. Each audio tape interview was preserved as an original artifact of the research as a Windows Media ® audiofile or an audiotape. These artifacts are part of the completed dissertation packet of the researcher and a permanent matter of record.

Researcher Field Notes

The researcher recorded field notes during the interview as an observational protocol (Appendix F - Field Note Form). These handwritten notes were particularly useful for observed conditions during the interview not capable of being captured by an audio record. Examples of these conditions included body language, eye contact, or subtle yet emotional appearance during a response. These researcher observational protocol notes were preserved as integral to the interview record. An informative example of field note value was the tension that was experienced by the focus group when one participant conveyed a life-and-death decision in unspoken "body language." She paused after describing her intuitive decision in a hospital waiting room, widened her eyes as she glared at each participant, and slowly looked to the floor and frowned. The audio recording was incapable of capturing this uneasiness and the meaning of several moments of silence on the audio recording or transcript.

The field note form design listed sections for interview description and reflection of the researcher. Researcher comments on the form included a summarized chronology of interesting topics or events, unexpected avenues of discussion, time log notes to track a particular context that appeared critical to supporting an opinion, or images the researcher visualized as a participant spoke and interacted in the interview.

The effectiveness of field notes evolved as the researcher conducted repetitive listening of audio recordings and recurrent readings of transcripts. These aspects of interpretation focused on researcher self-reflection and critical reasoning that occurred during the research.

Graphics and diagrams that emerged from researcher ideas during or after the interview process were added to the field notes. Member checking such thoughts or illustrations with the participant during or after an interview assisted in qualifying a participant's oral expression and meaning. These images, noted in a moment of revelation during an interview, or immediately after the interview, were addressed with reflective comments by the researcher in the learning journal.

Researcher Learning Journal

The researcher maintained a daily learning journal during the research process of exploration. This technique concentrated on personal reflection-on-action (Schön, 1987). As inquiry progressed through research, collection, and interpretation, the researcher challenged or

reinforced the evolving personal experiences with this personal resource log. (Appendix G - Researcher Learning Journal Form). Insight and recognition of potential researcher bias, new topic areas to explore, or recurring personal actions and reactions were additive to a better understanding of the research process and the researcher role as the primary instrument of exploring the phenomenon.

Some personal reflections in January 2012 indicated the significant value of a regular journaling discipline. Part of that learning journal entry was as follows:

My regular writing in a learning journal allowed me to literally reopen pages to past incidents and focused reflection on an issue at a particular time and place. Subsequent thinking often teased whether a new thought was truly an epiphany, or a piece of implicit knowledge that had been jarred loose from some sublime recess in my brain to become explicit knowledge.

The indications of such recurring worth convinced me to maintain the learning journal as a *living* document. A technique that started as a binder disciplined with structured pages and sub-headings soon became a repository for snippets jotted while reading a book, notes scribbled on the back of receipts, small pages from my Moleskine ® notebook, or images doodled with pencils or pens on a napkin while ignoring a cup of coffee. This "going with the flow" was a creative process that amassed a stuffed five-inch thick binder and required progressing to another three-inch binder. Sometimes casually paging through my tome, I rediscovered or illuminated a meaning hidden in my first impressions on an interview; a model discussed in a published research report or professional book or article; or an adaptive angle of how to interpret and use these episodes of my own research project. The learning journal became *my* "voice" to myself.

By studying the experiences of participants who operated in crisis situations, I gained personal insight on how something implicit emerged to prompt and convince that a particular way of explicit action was appropriate. At times, these personal venues appeared to be assaults on what I *knew* to be true, or at least what I thought to be true. This constant challenge of wanting to be objective and unambivalent in a subjective arena of inquiry was often stressful. Nonetheless, the stress was constructive for me. Reminding myself that lifelong learning was fraught with personal biases, I learned to self-assess and sustain the tempered perspective of a researcher seeking trustworthiness.

For example, the quest of a researcher making sense of implicit knowledge from participants' vantage points was a daunting proposition. Each commissioned officer had a unique perception and ability to transfer sensation, thought, and personal image into an explicit expression of intuition as he or she lived, decided, and acted. These events had occurred in tangible real-world conditions, or impalpable yet compelling stimuli still ill-understood by a participant. Such intuitive decisions often determined much more than mere success or failure of a simple task.

Listening to a participant describe such recollections of intuition, often in very dangerous situations, imparted their knowledge to me as a vicarious experience. I perceived a higher level of awareness and understanding from my own experience with each of the participants. I regularly assessed my interaction with participants and the collected evidence; the environment and contemporary issues that may have influenced their interpretation; and how I perceived their meaning. Making time to assess and evaluate my feelings, sensations, and thinking throughout this research was a fundamental expectation in the research design. My personal perspective, given the qualitative nature of inquiry on the phenomenon, was equally important to the findings and recommendations of the research. I was and am responsible and accountable for the collection and interpretation of this research.

During the beginning of my research project when I first encountered the writings of Polanyi (1958), I thought his famous statement that, "We can know more than we can tell…we can tell nothing without relying on our awareness of things we may not be able to tell" seemed to be more of a clever twist on words than a profound statement. I was wrong. Intuition is profound. Polanyi's understanding of tacit knowing was not mystical. He believed in "natural ability, fostered by training and guided by intellectual effort" (1958, p.106).

Journal questions and candid hand-written responses or quickly sketched images sometimes prompted a deliberate review of research experiences while the feelings or recollections of the researcher were current and vivid. Making the time to reflect critically on the integrity of the research process was fundamental to appreciating research interpretation and

verification. Several examples of the type of self-assessment issues the researcher considered were as follows:

- What was my research objective for today?
- How do I know that I made progress in my research tasks?
- Did I allow any participant's comment to remain unclear to me?
- How did I feel emotionally and physically today?
- How did I react when I did not agree with a participant's response?
- What could I have demonstrated as effective non-judgmental body language?
- How am I expressing empathy and focused attention to my participant?
- Do I need to consult with a peer expert on today's research result?
- Do I need to follow up with a participant on a specific interview comment?
- How am I going to act differently in the next interview?
- What will I retain in my personal manner of conducting an interview?
- What do I perceive about myself that I did not consider one week ago?
- What is the one most important research outcome that occurred today?

Qualitative Interpretation

Guba and Lincoln (1981) proposed an insightful qualitative perspective that affected inductive reasoning and interpretation of data. They stated that tacit and propositional knowledge functions simultaneously for the naturalistic inquirer, and that "…until we understand more about the functions of the brain, we shall simply go on 'understanding' that we somehow 'knew' something of which we were not consciously aware" (p. 135). This comment by Guba and Lincoln bore strong resemblance to Polanyi's belief that "we can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell" (Polanyi, 1964, p. x). Critically thinking and reflecting provided insight (Brookfield, 1987; Brookfield, 1990; Brookfield, 1995). This cooperative artistic sensitivity and dedicated praxis appeared fundamental to effective interpretation skills by the researcher.

Listening actively, questioning, and talking empathetically with participants evoked hunches and impressions into a more conscious and articulate issue to examine. This awareness appeared at times to be an apprehension by a participant or an impression by the researcher. An

example of a non-threatening probe was, "That sounds interesting. I'm not sure I understand your point. Tell me more." The research accented an expectation that meaning is constructed socially by participants interacting with other people in an ever-changing real world environment. (Merriam, 1998). Appreciating the context of each participant's experience was critical to the research interpretation.

Constant Comparison and Inductive Analysis

Merriam (1998) accented that the "constant comparative method of data analysis is widely used in all kinds of qualitative studies" (p. 18). She stated "the key to understanding qualitative research lies with the idea that meaning is socially constructed by individuals in interaction with their world" (Merriam, 2002, p.3).

Inductive analysis of data was continuous and used a constant comparison technique during the research. Creswell (2008) acknowledged that constant comparative analysis has value in qualitative approaches to better understand a phenomenon. He posed questions such as, "What is the basic social psychological process or social structural process in the action scene?" and refers to two main endeavors of qualitative research: (1) "an exploration in which little is known about the problem" and (2) "a detailed understanding of a central phenomenon" (pp. 51 and 444). Patton (2002) added an issue of identifying and disabusing a misconception about a phenomenon.

Stake (1995) offered the possibility for experiential learning that he called naturalistic generalization. He stated this as "conclusions arrived at through personal engagement in life's affairs or by vicarious experience so well constructed that the person feels as if it happened to themselves" (p. 85). The manner in which the researcher analyzed and interpreted the narrative stories of participants attempted to convey this type of personal sensory and thoughtful description to the phenomenon of intuitive decisionmaking.

Patton (2002) stated that "developing some manageable classification or coding scheme is the first step of analysis" (p. 463). For qualitative rigor, the researcher interpretation applied coding to address data that appeared to converge in meaning, as well as data that was clearly divergent, contradictory, or problematic. Patton (2002) cautioned on expecting to find linear connections of a phenomenon. He stated that the "challenge of qualitative inquiry involves portraying a *holistic picture* [emphasis added by Patton] of what the phenomenon, setting, or

program is like and struggling to understand the fundamental nature of a particular set of activities and people *in a specific context* [emphasis added by Patton] " (p. 480).

Coding the Narrative

A coding process was crucial in making sense of qualitative data (Creswell, 2008). The *core phenomenon* was intuitive decisionmaking. In this research, coding involved attaching one or more keywords to a text segment in order to enhance "qualitative analysis of the relations to other codes and to context and action sequences" (Kvale & Brinkmann, 2009, pp. 201-202). Open coding, as an integral first step in a three-phased design, facilitated keeping a broad perspective on data, and kept emergent ideas as tentative to their meaning (Berg, 2007).

First, coding of collected data used a simple set of researcher keywords as initial categories of information for *open coding* of narrative for eventually "identifying a theme [or themes] that can be illustrated with numerous incidents, quotes, and so on" (Merriam, 1998, p.164).

In some cases, margin notations on a transcription expanded ideas on possible connections or divergent meanings for open coding of information. Here, the human element of the researcher was critical to "creatively synthesize and present findings" (Merriam, 1998, pp. 56 and 58). The details of comparison and contrast provided a deeper appreciation of incidences, coincidences, and interrelationships.

One technique used by the researcher to facilitate peer reviewer comments was to produce paper copies of a transcribed narrative with a one and one-half inch right indentation to each page. This format provided ample space for notes during the peer review.

A coding guide provided to each peer reviewer listed an initial list of code with definitions for their consideration. The instructions in the coding guide stated that the code list was not a limitation. Identifying additional code words was encouraged by the researcher with a requirement to also provide a concise definition. This assisted the researcher in stating a common understanding if a new code was incorporated into the coding guide. (See Appendix H – Researcher Coding Guide.)

The researcher also encouraged peer reviewers to identify the most significant code or their interpretation of how code seemed to group into topic areas. This assisted the researcher in comparing and contrasting his personal grouping of code into categories.

Second, a form of *axial coding* or "coding frames" (Berg, 2007, p. 320) started to group data and keywords based on narrative similarities, and *causal conditions* [emphasis added] that appeared to influence the core phenomenon (Creswell, 2008). When the researcher perceived a relationship to a prime principle of intuitive decisionmaking, a further attempt was made to associate or link other identified categories-codes to this "core" category.

Rearranging elements of possible or potential categories and their relationships during these analyses revealed previously unseen relationships. Details of comparison and contrast provided a deeper appreciation of how a participant expressed a concept. Thematic topics pointed to a keen appreciation of personal meaning. For example, how a participant emphasized personal morals and ethics in the culture was sometimes a significant attribute in expressing an individual understanding of intuitive decisionmaking.

The third phase of this three-phase process was *selective coding*. Causal conditions linked to a core category illuminated possible strategies and actions that occur in a process, contextual and intervening conditions that influence action, and consequences of a particular action. The researcher presented an explanation of what emerged from the coding process for improved understanding and *illustration* on the perception of intuitive decisionmaking. The construction by the researcher created a visual audit of the qualitative interpretation.

A figure or diagram illustration was an effective vehicle to display the connections of process to understanding. A sequence of open and axial coding, concluding with selective coding, resulted in a "visual picture" and narrative explanation of what occured (Creswell, 2008, p. 434).

Figure 3.3 is a visualization of the coding paradigm in this research. The specific or general actions that resulted in the vignettes of participants provided a menu of perspectives to critically and creatively assess. Their recollections of what occurred opened a vantage point for the researcher to assess and interpret. Sketching a diagram led the researcher to awareness of what influences did or may have led to a particular intuitive decision. Sometimes any linkage of cause and effects remained a vague memory of circumstances by a participant. At times, a participant recalled an explicit condition in personal feeling or cue that prompted the intuitive decision. And in other instances, a participant could remember the intuitive moment but continued to struggle with an explanation to connect causal condition to action. Displayed as causal conditions and aspects of contextual complexity, participants indicated conditions that were positive, negative, or positive and negative influences on making an intuitive decision.

Figure 3.3 Visualization of Coding Paradigm in this Qualitative Research

Open Coding Categories

Perception
  Epiphany
  Discovery
  Physical Cue
  Cognitive Sensation
Knowledge
  Tacit Knowledge
  Predictive Knowledge
  Metacognition
  Cognition
  Risk
Pattern Recognition
Experience
  Personal experience
  Vicarious experience
  Affective
  Somatic
  Role Modeling
  Training
  Performance Feedback
  Lifelong Learning
Education
  Critical Thinking
  Creative Thinking
  Inquisitiveness
  Innovate
  Professional Education
  Mentorship
Intelligence
  Inductive Reasoning
  Practical Intelligence
  Mental Simulation
  Contextual Similarity
  Contextual Contrast
  Judgment
Self-efficacy
  Intrinsic Motivation
  Spiritual Values
  Confidence
  Courage
  Ethics-Morals
  Uncertainty
  Anxiety
  Bias
Expertise
  Artistic
  Adaptability
  Mental Agility
  Domain Expertise

Significant *Causal* Conditions from Participants

Potential Positive Influences:

- **Perception**
- **Tacit Knowledge**
- **Clues**
- **Recognitional Skills**
- **Role Modeling**
- **Mentorship**
- **Army Doctrine**
- **Age-Experience**
- **Culture**
- **Domain Expertise**
- **Critical Thinking**
- **Reflection**
- **Self-efficacy**
- **Synthesis**

Potential Negative Influences:

- **Overconfidence**
- **Ignorance**
- **Uncertainty**
- **Anxiety**
- **Fear**
- **Toxic Leadership**

Specific Contextual Conditions

- Time Constraint
- Proximity to Effects
- Tacit Knowing
- Cues and Clues
- Pattern Recognition
- Toxic Leadership
- Age-Experience
- Domain Expertise
- Reflection-*in*-Action

General Contextual Conditions

- Army Doctrine
- Uncertainty
- Risk Management
- Mentorship
- Culture-Values
- Critical Thinking
- Reflection-*on*-Action

Explicit Knowing and Tacit Knowing

Assess and Internalize

Feedback: *Think --* Critically Creatively

Success ☐
Alternatives ☐
Failure ☐

Results

☐ Act
☐ Wait
☐ Do not act

Actions

Strategies

Intuitive Decisionmaking ☆: Decision

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The explanation in Chapter 4 was not considered an absolute solution to the research questions. It cannot be. The conundrum of exploring a phenomenon that by definition is "direct knowledge or cognition without evident rational thought and inference" (*Merriam-Webster Online Dictionary*, 2011) may sometimes result in an "abstract explanation" (Creswell, 2008, pp. 434 and 437).

Creswell cited Denzin (1989) on a researcher's interpretation "which must engulf what is learned about the phenomenon and incorporate prior understandings while always remaining incomplete and unfinished" (Creswell, 1998, p.206). This statement had an elegant simplicity in the open-endedness of any interpretation of personal narrative and its meanings.

Findings in Chapter 4 portrayed a visual representation of selected perceptions and understanding of intuitive decisionmaking as expressed by participants. The researcher applied strategies to verify the trustworthiness of findings and recommendations. According to Creswell (1998), verification was "a distinct strength of qualitative research in that the account made through extensive time spent in the field, the detailed thick description, and the closeness to participants in the study all add to the value of the study" (p. 201). These methods accented the cogent and coherent trustworthiness of this research.

Validation Strategies

"The naturalistic investigator [researcher] begins with a discovery posture, but that posture may lead him to insights that he may then proceed to verify" (Guba & Lincoln, 1981, p. 90).Verification was "a distinct strength of qualitative research in that the account made through extensive time spent in the field, the detailed thick description, and the closeness to participants in the study all add to the value of the study" (Creswell, 1998, p. 201). In his third edition of *Educational Research*, Creswell (2008) provided multiple approaches to determine qualitative standards with a comparison of at least three sets of expert standards. Triangulation was a term with varied meanings. He defined triangulation as "the process of corroborating evidence from different individuals…types of data…or methods of data collection…in descriptions and themes" (p. 648).

This verification construct exhibited at least three reference points that indicate degrees of convergence when attempting to intersect references. One of Creswell's recommended uses was to corroborate evidence among participants and experts, different methods of data collection

such as interviews and field notes, and researcher self-reflection. Member checking with participants and external auditing with peer experts was exercised in this research. The researcher evaluated the research for clarity, consistency, and competence with a set of questions derived from Creswell's (2008) model. The researcher considered the following questions as part of the research verification process:

- Does the research question remain central to analysis, interpretation, and findings?
- How does the researcher account for varied opinions in the literature review?
- How is rigorous qualitative data collection demonstrated?
- How is a narrative tradition of inquiry evident in the research study?
- How does the researcher address reflexive self-awareness in the interpretation?
- How does constant comparative technique indicate accurate qualitative interpretation?
- How does the research study affect contemporary U.S. Army understanding of the phenomenon of intuitive decisionmaking?
- How does the research study impact on current adult education literature?
- How do philosophical assumptions of the study align with the research findings?

Merriam (1998) spotlighted a main assumption in qualitative research that reality is holistic, multidimensional, and ever-changing" (p. 202). Convergence or divergence in interpreted data is an ever-present possibility. Patton (2002) noted that inconsistencies can be "offering opportunities for deeper insights into the relationship between inquiry approach and the phenomenon under study….Understanding the inconsistencies in findings across different kinds of data can be illuminative" (p. 248).

Constant comparison, the "comparing and contrasting information drawn from different sources [semi-structured interviews, peer reviews, researcher self-reflection, and member checks in this research]...is useful for verifying information on the same event...and producing more confidence in the data generated by different methodologies" (Guba & Lincoln, p. 257).

Participant Member Check

Qualitative interpretation occurred throughout the research with the intention to elicit key issues, refine potential themes as they emerge related to participant perception, as well as identify data that suggests any significant divergent opinions from participants. Interpretation of divergent data was also considered in the dissertation findings. Guba and Lincoln (1981) noted

that participants' knowledge may be limited and that the researcher must attend to any indication of participants' intentional or unintentional misinformation.

Selective data was discussed between the researcher and a participant to ensure a common appreciation of a question or topic, and verify how the collected data was understood by the researcher. Beyond confirming the accuracy of what a participant said in an interview, the researcher requested that the participant comment on the accuracy of the researcher's interpretation. Participant "voices" were accurately represented on their individual perception of intuitive decisionmaking in a military and lifelong learning context.

Whether personal or vicarious in instance, the metaphors of image and language may be a making of meaning through deep personal insight (Gardner, 1993; Gardner, 1995; Gelb, 1998), not so much in the actual words that are stated, but in the ability to evoke an essence that "speaks through silence" (van Manen, 1990, p. 49). This appreciation paralleled Polanyi's (1964) claim about tacit knowing: "We can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell" (p. x).

Peer Review

Several expert peers of the researcher reviewed selected interview transcripts and provided their individual assessments to the researcher. These episodic expert peer reviews were compared and contrasted to the researcher's assessments of participants, member checking with participants coordinated by the researcher, and the continuous reflexivity of the researcher on potential meanings throughout the research. See Figure 3.4 for an illustration of triangulation among the participants, peer reviewers, and the researcher.

The dialogue among peer experts on the participants' narratives and researcher's analysis supported the credibility of relating code categories to code interrelationships that aggregated into several themes for an improved understanding of intuitive decisionmaking. Describing and illustrating this peer review process supported the believability of the researcher's interpretation in "answering the major research questions and forming an in-depth understanding of the central phenomenon" (Creswell, 2008, p. 254).

The subject matter experts used as peer reviewers were faculty or staff members of the U.S. Army Command and General Staff College (CGSC) and Army Management Staff College (AMSC), and a member of the Army's Center for Army Leadership (CAL). See (Appendix I –

Peer Reviewer Expertise Summaries). Concurrently, the researcher discussed ongoing research with professionals associated with the Army Research Institute for the Behavioral and Social Sciences (ARI). This coordination and feedback reflected the personal and professional opinions of the subject matter experts, but were not considered in any manner as an official association of the professional organization in which they work.

Figure 3.4 Qualitative Interpretation Model: Researcher-Participants-Peer Experts
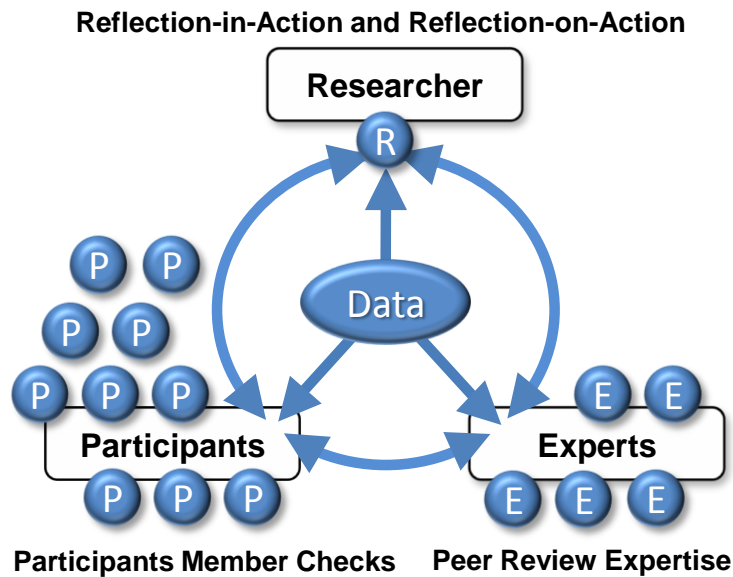
Figure 3.4. This model illustrates the interdependent process of researcher interpretation of collected data in constant comparison of researcher assessment, member checking, and expert peer review.

After assessing participant comments, one peer reviewer summary stated, "Expertise is evolutionary. It grows as individuals build their register of cues, processes, and [intuitive] actions" (Adam [pseudonym], personal communication, November 31, 2011). He expanded on his thoughts that "experiences form a list or register of cues from which the cognitive process recognizes a pattern or process. Based on the association of cue to experience, the individual selects a course of action [behavior]." Self-efficacy entered as the confidence to act. Multiple experiences were retained for future use a la expertise. The experiences were relational to context and similarity, and in the peer reviewer's words are "packaged as expertise."

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Gregory, another peer reviewer, focused on synthesis. He emphasized *synthesis* as "the product of past experiences tempering one another to produce a current outcome that reflects the contribution of the experiences." (Gregory [pseudonym], personal communication, November 22, 2011). He referenced Lewin's (1951) concept of "unconscious competence." He described this concept as something tells an individual immediately—it "pops" into your head. Gregory made a point to talk about *why*. The inquisitiveness of *why* is part of synthesis. Intuition may provide an immediate answer, but when time is available, discerning what caused that particular intuitive response may be appropriate. In an example of *why* versus *what*, he said, "Why is the enemy approaching from the south?" as opposed to "What happens if I attack them now?"

The peer reviewers, as a group of experts, identified common perspectives on intuition of valuing pattern recognition; critical thinking and reflection; and experiences and education leading to expertise. Aspects of creative thinking, self-efficacy, and taking risks related to intuitive decisionmaking might have to remain in the realm of qualitative belief rather than quantitative proof.

Self Reflection-on-Action

The personal self-reflection of the researcher during the research process provided insight and improved the understanding of "how" or "why" an intuitive decision occurred in a particular instance. Case study of intuition episodes varied in location and what happened. The trigger or cue was not readily discernible while the decision and action was discussed in the interviews, but considered that an epiphany might emerge from reviewing researcher notes written during an interview, a remark and context recalled as transcripts are read and reread, or a personal dedication to "just think about thinking."

Personal understanding by a participant could also be immediate. On more than one occasion in interviewing participants, the perception of intuition was a simple statement: "I just knew it." As an educator, Schön (1987) illustrated the blending of technical skill with professional *artistry* in personal examples of teaching architectural design students. Similar conditions of practical knowledge and artistic conduct had direct application to the research group of knowing-in-action and reflection-in-action. Schön described knowing-in-action as "the sorts of knowledge we reveal in our intelligent action – observable, physical performances" but

are often "unable to make it verbally explicit" (p.25). He suggested that when this dynamic quality of knowing can be described, this tacit competence becomes knowledge-in-action.

His premise on reflection-in-action had value for both the researcher and participants' understanding of intuitive decisionmaking. A key element in this type of reflection was the cognition of an "immediate significance for action" even though a separation of reflection and knowing may be subtle (p. 29). Schön (1987) presented an appreciation of what he called this form of professional artistry:

> In reflection-in-action, the rethinking of some part of our knowing-in-action leads to on-the-spot experiment and further thinking that affects what we do–in the situation at hand and perhaps also in others we shall see as similar to it (p. 29).

In *Educating the Reflective Practitioner*, Schön (1987) suggested that reflection-in-action can be used to perceive the context of uniqueness or surprise while in an action. This knowing would be "tacit, spontaneously delivered without conscious deliberation" (p. 28). Reflection after such an action might identify a condition of personal experience that triggered why an intuitive decision occurs (King & Kitchener, 1994). Participant examples in Chapter 4 suggested this possibility of latent knowledge, implicit recognition, and resulting cogent knowledge of how intuition may progress from a tacit sensation to an explicit act. The researcher sought to articulate a synergy between reflection-in-action and reflection-on-action by participants in the research.

Acknowledging personal experiences and individual history was integral to the researcher's and each participant's frame of reference in this research. See (Appendix J – Researcher Expertise Summary). Merriam (2002) stated the researcher should describe areas of professional and personal interest such as why the researcher chose this phenomenon to study, what is the rationale for selecting the particular sample, and "what values and assumptions might affect data collection and analysis" (pp. 26 and 31). She also recommended a critical reflection of *self* regarding assumptions, worldview, biases, theoretical orientations, or other relationships to the research. These issues emerged from participants also. Figure 3.5 illustrates an underlying assumption of the researcher: latent knowledge exists and can emerge to consciousness as immediate knowing, and can be applied as cogent knowledge.

Figure 3.5 Flow of Implicit to Explicit Learning: Intuitive Decisionmaking

Latent Knowledge -- Immediate Knowing -- Cogent Knowledge

Figure 3.5 Visualization of vast amount of personal latent knowledge that emerges as an intuition and transforms into cogent knowledge for deliberate thought and decision.

Rigor of Verification

Rigor, according to Guba and Lincoln (1981), was an essential requisite in order "to establish *trust*" [emphasis added] in the research outcomes (p. 103). Method must demonstrate "worth" that operated within a "context-related property or set of characteristics of the entity [participants] being evaluated" (p. 82). Worth was value-laden and is not necessarily empirical in nature. For example, individual participant values, demographic characteristics, and motivational preferences indicated the context of a particular time, location, and setting. These vantage points identified a world comprised of multiple perspectives, divergent and convergent personal interrelationships, and a meaning in qualitative study that is context dependent to the individual participant.

Guba and Lincoln (1981) stated four tests for qualitative rigor: (1) truth value; (2) consistency; (3) applicability; and (4) neutrality. Assessed collectively, these aspects signaled the degree of *trust* that an attentive audience will accept. Qualitative terms (credibility, auditability, fittingness, and confirmability) that aligned to these aspects of rigor were displayed in Figure 3.6 to indicate the expectation of trustworthiness. In this case, dimensions of confidence belief, replicable capability, contextual frame, and positional relevance complemented the qualitative rigor demonstrated by the researcher.

Subjective inquiry approached from positional relevance and focuses on confirmability of the data rather than any quest for singular objectivity (Guba & Lincoln, 1981). Patton (2002) suggested triangulation as a means to "*test for* such consistency" [emphasis added by Patton] (p. 556). He surfaced a key point that obtaining the same result in multiple forms of triangulation is not the required outcome. The additive value was "understanding inconsistencies in findings across different kinds of data" (p. 556). Guba and Lincoln amplified the message that

"different interpretations are functions of different value positions" (p. 328). Uniformity was not the aim as much as deep insight into how the participant makes meaning. They cited Wolf and Tymitz (1977) that human perceptions in qualitative inquiry were "attempts to present 'slice-of-life' episodes documented through natural language and representing as closely as possible how people feel, what they know, and what their concerns, beliefs, perceptions, and understandings are" (p. 78).

Replicable capability was an interest in qualitative consistency; however, findings by another researcher were not expected to be exactly the same as in this study. Guba and Lincoln (1981) stated that such an audit of findings should be able "make sense in view of the data pool from which the first judge [researcher] worked and that the data have been arranged into the developed category system" (p. 122). Forms of triangulation in this research checked and documented issues of consistency throughout the research (Patton, 2002) with techniques such as comparing researcher interviews with observations and field notes, or comparing participant comments with published Army doctrine on intuitive decisionmaking (U.S. Department of the Army (2003, 2006, 2010, 2011), as well as professional literature such as Polanyi (1958), Wertheimer (1945), and Bandura (1997) on the philosophy and psychology of intuition and social behavior. Figure 3.6 relates rigor with terms closely associated with qualitative validity.

Contextual frame referred to the specific conditions surrounding and acting upon a particular action of intuitive decisionmaking. This context was a subjective endeavor. Guba and Lincoln (1981) cited Scriven (1972) and related subjectivity "to what concerns or occurs to the *individual* [emphasis added by Scriven] subject [participant] and his experiences, qualities, and disposition" (p. 124). Guba and Lincoln spotlighted that "situational interactions are always so complex that any observation can have meaning only in the actual situation in which it occurred" (p. 116). Nonetheless, Guba and Lincoln's term of "fittingness" indicated a requirement to compare and contrast the conditions between two or more contexts in order to identify the level of similarity or difference that exists. They suggested the value of thick description as expressed by participants in qualifying the applicability between or among contexts. Even then, Guba and Lincoln noted that each context may have its own "'natural language'…[and] is likely to have its own idioms, its own rhythm, its own hallmarks" (p. 366). In this research, peer expert reviews were personal and independent evaluations of participant comments. The researcher triangulated their opinions with member checking comments and researcher interview field notes and observations.

Confidence belief in qualitative research was a personal commitment to discovery (Guba & Lincoln, 1981). The quest moved from explicit data toward information that was vague or ambiguous with a belief that improved understanding is possible. "In effect, the evaluator [researcher] inches his way from the known to the unknown" (p. 98). Collecting information continued until the researcher "sense[d] regularity in the available information" (p. 100) to a point of saturation. Guba and Lincoln promoted naturalistic inquiry as encouraging "connotative or tacit knowledge to come into play" (p. 70). They invited "extending awareness of a situation beyond mere propositional knowledge to the realm of the felt, to the silent sympathies, to the unconscious wishes, and to the daily unexamined usages" (pp. 135-136). In this regard, the researcher was "most concerned with testing the credibility of his findings and interpretations" with the research participants.

Figure 3.6 Linking Qualitative Trustworthiness to Aspects and Intent of Rigor
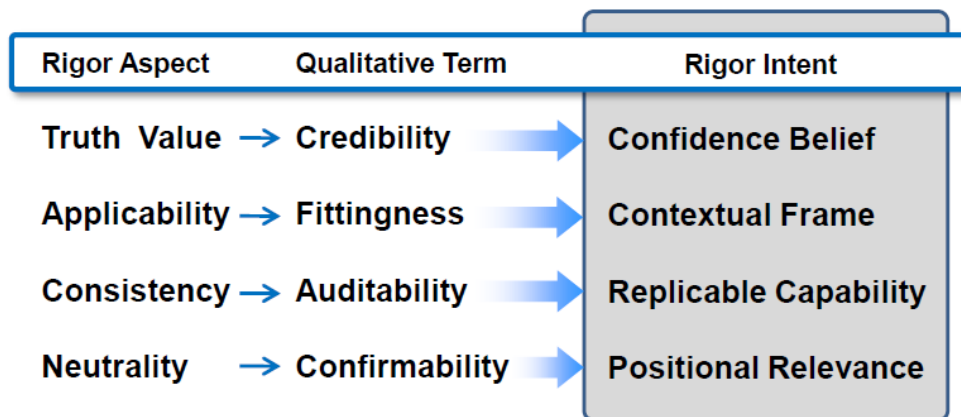
Figure 3.6. This illustration aligns aspects of rigor, qualitative terms, and their naturalistic intent to indicate the trustworthiness of qualitative inquiry. As adapted and applied from Guba and Lincoln (1981), *Effective Evaluation: Improving the Usefulness of Evaluation Results through Responsive and Naturalistic Approaches,* San Francisco: Jossey-Bass, p. 104.

Triangulation was a recurring means to indicate credibility. "Triangulation, in whatever form, increases credibility and quality by countering the concern (or accusation) that study's findings are simply an artifact of a single method, a single source, or a single investigator's blinders" (Patton, 2002, p. 563). A combination of different forms of triangulation noted by

Patton was used in this research with a technique of constant comparison. Those forms of verification were as follows:

- Methods (oral interview, audio recording, field notes, and researcher learning journal).

- Evaluation sources (researcher, focus group, pilot interview, Army doctrinal publications).

- Analyst sources (member checks, peer review).

- Theory perspective (Polanyi's theory of personal knowledge and tacit knowing; Wertheimer's theory of gestalt psychology; Sternberg's theory of practical intelligence, and Bandura's concept of triadic reciprocal causation among other philosophers, psychologists, and adult educators; and Schön's education in practice).

Collecting and interpreting data continued until the researcher realized saturation of information. Techniques included detailed reading of interview transcripts, and complementing these reviews with listening repeatedly to the audio recordings in order to appreciate a participant's original sense of descriptions. Transcripts of the audio recordings were compared with researcher field notes to link ideas with illustrative quotes or rich narrative segments for researcher comment and interpretation.

The researcher assessed personal perceptions with an intention of "empathetic neutrality and mindfulness" (Patton, 2002, p. 40). The challenge of recognizing researcher preferences was critical to the potential of discerning what participants' stories mean as *they* [emphasis added] perceive meaning. Creswell (2008) posed that "qualitative researchers do not typically use the word *bias* [emphasis added by Creswell] in research" (p. 266). He recommended a clear statement on the interpretive and self-reflective nature of the researcher role and what the researcher's personal worldview may suggest as the research is interpreted. This technique acknowledged that qualitative study is a humanistic endeavor and would contain some level of personal perspective.

In *Effective Evaluation*, Guba and Lincoln (1981) presented complementary means to demonstrate qualitative rigor in research. Four terms they offered to focus this naturalistic perspective are credibility, fittingness, auditability, and confirmability.

- *Credibility*

Credibility was enhanced by analyzing outcomes and findings of the research with the participants, a group of subject matter experts, and researcher self-assessment. Techniques included member checking data with participants and subject matter experts.

- *Fittingness*

Fittingness was determined by assessing the particular context in which this research was conducted and meaning that was interpreted from a purposeful sample. This aspect countered the concept that scientific rigor must be able to display a generalization. In qualitative inquiry, context rather than generalization is a critical intention.

- *Auditability*

Auditability accepted an environment constructed of multiple realities where: "auditability requires simply that the work of one evaluator (or team) can be tested for consistency by a second evaluator or team, which, after examining the work of the first, can conclude, "Yes, given that perspective and those data, I would probably have reached the same conclusion" (Guba & Lincoln, 1981, pp. 123-124).

- *Confirmability*

Confirmability, in a qualitative sense, detailed the relationship of the researcher to the data and multiple reference points. The lived experience record of participants was checked by the participants themselves, selected subject matter experts, and the researcher in order to identify typical or atypical findings. Patton (2002) cited Denzin (1978) as calling this act "investigator triangulation" (p. 247).

Confidence in Interpretation

The interpretive model of Guba and Lincoln's research has been expanded upon by many researchers. Whittemore and Melkus (2008) stated that the qualitative researcher is most concerned with validity aspects of "credibility and authenticity or the trustworthiness and confirmability of data collection, data analysis, and interpretation" (p.205).

Whittemore, Chase, and Mandle (2001) described credibility as the confidence in interpretation and confirmability as the potential for agreement on interpretation when data is analyzed by multiple people and vantage points. They used Lincoln and Guba's criteria (1985) as

their "gold standard" for establishing qualitative validity, and add confidence to interpretation with a two-tiered criteria model for validating qualitative inquiry. This research configured an interpretive model as illustrated at Figure 3.7.

Figure 3.7 Verification Model of Qualitative Interpretation in Research

Qualitative Data and Interpretation

Credibility   *Accurate Interpretation*   Authenticity
Rigor of Research -- Context *-- ala Participants*

Criticality   *Essence versus Bias*
Reflexive Openness   Integrity
Recursive Assessment

Validity

Explicitness
Auditability of Research
Vividness
Thick Veracious Detail
Creativity
Imaginative Presentation
Thoroughness
Compelling Completeness
Congruence
Coherent Integration
Sensitivity
Holistic Persuasion

Verifiability

Figure 3.6. Verifying credible and trustworthy interpretation of participant perceptions of experience and thought. As adapted and applied from Whittemore, Chase, & Mandle. (2001). "Validity in Qualitative Research," *Qualitative Health Research*, 11, (4), pp. 522-537.

The primary grouping of this model involved credibility and authenticity which compared interpretation for accuracy and believability as expressed by the participants. How the researcher interpreted the narrative influenced the discernment of differences in what meanings are possible, probable, or believed. Whittemore, Chase, and Mandle (2001) state, "Developing validity standards in qualitative research is challenging because of the necessity to incorporate rigor and subjective as well as creativity into the scientific process" (p. 522).

The secondary grouping of this model progressed with evaluation of explicitness, vividness, creativity, thoroughness, congruence, and sensitivity. The creative yet accurate presentation of interpretation was convincing in its thoroughness and coherence as directly supported by the research.

Merriam (1998) stated that "a researcher wishes outsiders to concur that, given the data collected, the results make sense…" (p. 206), and supports the perspective of qualitative reliability. She credited the value of committing to genuine interest in the topic under research, the confidence of experience, a self-awareness that evolves during the research and interaction with participants, and an authenticity that emerges as being part of the research interpretation in an emergent process of discovery. In learning about others and their experiences, she said, "Expect to learn about yourself" (Merriam, 2002, p. 421). The research experience was lived experience and true. This experience was a social-cultural-professional relationship between the researcher and participant.

Ethical Safeguards

This research was conducted in compliance with all Kansas State University (KSU) Institutional Review Board (IRB) human rights and ethical safeguard policies for research with human subjects as administered by the KSU Committee on Research Involving Human Subjects. Research policies are stated in Kansas State University *IRB (Human Subjects) Policy* (2010). The researcher also complied with U.S. Army Command and General Staff College policies for research with human subjects in accordance with CGSC Bulletin No. 40, *Research within the CGSC*, (2010). The researcher was responsible and accountable for all compliance requirements of the research. No issues occurred during the research that required the researcher to notify the Kansas State University IRB and the U.S. Army CGSC. Furthermore, the researcher conducted

the research with professional principles of trust, justice, fidelity, and integrity to ensure unquestionable ethical conduct and protection of human subjects.

Informed consent and confidentiality memorandums acknowledged with personal signature were obtained from all participants in the focus group, pilot interview group, and purposeful sample. Peer reviewers and the transcriptionist signed nondisclosure statements as part of the overall confidentiality of research interview data.

Documentation of the research, interview process, and dissertation has been transferred to a CD-ROM with selective data preserved as paper documents. A copy of the complete research documentation was secured in a bank safe deposit box leased by the researcher. This documentation will be maintained by the researcher as a historical matter of record.

The dissertation, approved by the Kansas State University Graduate School, was posted to the K-State Research Exchange (K-Rex) at krex.ksu.edu. This is the university's website and digital archive for electronic theses and dissertations reports (ETDR), and other scholarly works. The dissertation was also posted on UMI/ProQuest. An electronic copy and one bound copy of the dissertation were donated by the researcher to the U.S. Army Command and General Staff College and its Combined Arms Research Library (CARL). One bound copy and CD-ROM of the dissertation was retained in the personal files of the researcher.

Summary

This chapter addressed a methodology of qualitative inquiry used by the researcher in this bounded case study on intuitive decisionmaking. Research design demonstrated a naturalistic basis common to qualitative study, findings, and recommendations. The method of inquiry centered on in-depth semi-structured oral interviews with participants.

The researcher was the primary research instrument to personally collect and inductively interpret data. Prior to conducting interviews with research participants, the researcher conducted a focus group and piloted interview techniques to be used in the study. Interviews were audio recorded and professionally transcribed to narrative text documents. The researcher created field notes and maintained a reflective learning journal.

These methods of qualitative inquiry developed believable research that contributed to knowledge in the discipline and *art* of intuitive decisionmaking. The lived and vicarious experiences and recollection of participants, and researcher interpretation of participant data,

were validated by the participants via selected member checks, subject matter expert peer reviews, and the researcher using a constant comparison of data in order to identify typical or atypical findings. All protocols and safeguards for research with human subjects were complied with explicitly as required by policies of the Kansas State University (KSU) Institutional Review Board (IRB) and U.S. Army Command and General Staff College.

A verification strategy for research findings and recommendations cross-referenced and assessed participant expressions with multiple validity approaches. Qualitative validity in this study adapted and applied a two-tiered method of verification process of Whittemore, Chase, and Mandle (2001). Their model adapted modeling by Guba and Lincoln (1981).

When reviewed by an interested audience, the findings and recommendations indicated an authentic naturalistic rigor accepted readily as believable. The qualitative verifiability of this research added to the professional adult education and U.S. Army doctrinal literature on intuition in making decisions. The research recommendations posed open avenues for continued adult education and U.S. Army exploration on the phenomenon of effective intuitive decisionmaking.

Chapter 4 - Findings

The situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer.

Simon

Introduction

This chapter presents the findings of qualitative research concerning intuitive decisionmaking as perceived by a small purposeful sample. The semi-structured interview process, as a technique, encouraged an open exchange of thoughts and beliefs between the individual participant and the researcher. Two primary research areas explored topics of (1) what *is* intuitive decisionmaking from the individual perspective of 10 midcareer officers in the U.S. Armed Forces, and (2) how does experiential learning—personal or vicarious—affect personal understanding and use of intuitive decisionmaking.

The quote at the head of this chapter by the renowned Herbert Simon was used by David Kahneman, a respected expert in the field of psychology, in his book *Thinking, Fast and Slow* (2011). In Kahneman's opinion, "The psychology of accurate intuition involves no magic" (p.11). In decisionmaking under conditions of uncertainty, his lifetime of research and study indicated that "accurate intuitions of experts are better explained by the effects of prolonged practice than by heuristics" (p. 11). The experience must also be relevant, that is, informative to a particular domain of practice. Acknowledging that human memory has many flaws, Kahneman marveled at the quality of skilled associative memory. Given unequivocal feedback on the correctness of thoughts, decisions, and actions; effective skill evolves. This type of practiced skill "distinguishes surprising from normal events in a fraction of a second, immediately generates an idea to what was expected instead of a surprise, and automatically searches for some causal interpretation of surprise and events as they take place" (p. 416).

The interpretation of findings in this research reinforced a concept that accurate pattern recognition—often implicit—was a fundamental aspect of intuition. The voices of participants in this research also indicated that *intuition* is not a model that can be comprehensively disintegrated, minutely calculated, and then reassembled into a coherent whole. The reflections of participants suggested that a degree of *tacit* knowledge will be ever-present.

Findings were discerned in the contemporary real-world context of each participant in 2011. When this research was conducted, participants were attending a professional military education course in the relative safety of duty in the U.S. Homeland at the U. S. Army Command and General Staff College. From a military viewpoint of participants, the reality of past experiences was a complex and uncertain environment of military missions and their own lifelong learning as an individual. The projection of future life events for each of these officers after course graduation included an expectation of military deployments that will most likely place them again in dangerous conditions such as Afghanistan or other contested regions of the world. Each participant was a volunteer in this research. Although personal bias and preferences were assumed to be present as a norm of human culture, the researcher deemed the expressions of each participant throughout the interview process as candid, believable, and trustworthy.

Qualitative research was an exploration of a phenomenon–intuitive decisionmaking. This inquiry was a naturalistic search to articulate participants' meaning or meanings on their perception or understanding intuitive decisionmaking. To emphasize what and how the *voice* of a participant evoked meaning in a personal context, their examples were used to support several themes that emerged from the interpretive research. Examples were compared and contrasted, when appropriate, to obtain clarity and provide specificity or uniqueness, and often created a persuasive image to what might otherwise be a vague description.

Examples shared by the participants offer a colorful and contextual intensity to qualitative inquiry (Skwire & Skwire, 2011). In this research, quotes and vignettes spoken by participants clarified thought process for the participant and the researcher, added interest to explanations, and fostered visualizations of how an intuitive decision occurred for a participant.

 Interpretation of subjective data–the *voices* of participants–was collaboration among the participant, researcher, and peer reviewers. The professional interpretation by expert peer reviewers complemented the one-on-one participant and researcher interview experience of participant expressions and dialogue. The researcher triangulated participant, researcher, and peer expert comments to determine research findings. Uniformity was not the research goal as much as deep insight into *how* the participant expressed meaning. The qualitative rigor of research with the focus group, pilot interview group, and purposeful sample achieved five aims as follows:

- Interpreted dialogue within a contextual frame as provided by participant's vivid representation of a particular experience.
- Demonstrated an assessment of qualitative truth value and confidence in a participant's perception or understanding of intuitive decisionmaking.
- Presented research and data in a manner that is a replicable capability for qualitative consistency.
- Confirmed a method to indicate the trustworthiness of a participant's perceptions as checked by the participant, selected subject matter peer experts, and the researcher.
- Identified typical or atypical findings on the perception of participants about their intuitive decisionmaking, and the effects that personal or vicarious experiences had on their intuitive decisionmaking.

The remainder of this chapter provides a summary of findings relevant to the two research questions of this study. The findings spotlighted several themes that emerged through a process of inquiry with a focus group, pilot interview, and purposeful sample. The findings from the purposeful sample described intuitive decisionmaking as expressed by participants, and indicated how participants used personal or vicarious experiences to understand the act of intuitive decisionmaking. The dissertation is presented as information per standards in the *Publication Manual of the American Psychological Association* (2010).

As a technique to indicate meaning as interpreted by the researcher, a concise summary of these individual findings is introduced in this chapter and further amplified in the discussion in Chapter 5 (Lewin, 2010). The final paragraph of this chapter acts as a signpost on expectations for the discussion, as well as prepare for the implications, researcher reflections, and research recommendations stated in Chapter 5.

Research Questions in Review

Two research questions guided this exploratory inquiry on intuitive decisionmaking. The two primary questions were stated in a "what" format with the intention of fostering an emergent path of exploration on the phenomenon of intuitive decisionmaking. The research questions were as follows:

Research Question One

What is a participant's perception on the phenomenon of intuitive decisionmaking?

Research Question Two

What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?

Initial Qualitative Inquiry and Preliminary Findings

The perception or understanding of the two research questions by participants was best communicated with their own formal or casual vocabulary and verbal imagery. The researcher probed participant comments for lucid description, and interpreted their perceptions based on doctrinal norms of the U.S. Army and adult education literature presented in Chapter 2.

In some instances, narrative interpretation by the researcher was enhanced with visual representations or illustrations in order to present a concept, or display a sequence or flow of interconnected data. Findings evolved during three main phases of inquiry and interpretive assessment: focus group, pilot interview group, and purposeful sample.

The following section addressed preliminary findings from the focus group and pilot interview. These actions guided the subsequent research with a purposeful sample. Interpretation was evolutionary. The results were findings as presented in this chapter.

The Focus Group

The focus group served two main purposes. First, the group dialogue gathered candid data on the participants' perception of intuitive decisionmaking. Second, the researcher obtained feedback from participants on verbal interview process, relevance of the interview questions, and clarity of understanding question intent.

Comments from the participants in the focus group, five U.S. Army majors, indicated the fundamental relevance of the two research questions. From a draft list of 18 questions, several additional areas of interest emerged as important based on participant comments. As noted in chapter 3 of this study, focus group comments suggested that minor adjustments and several additional questions were appropriate to the interview process. Three examples of question additions are as follows:

- How does creative thinking relate to intuition?
- How would you relate "inquisitiveness" to creative thinking?
- What personal value do you place on your intuitive decisionmaking abilities?

The researcher facilitated dialogue among participants in order to indicate their perception or level of understanding intuitive decisionmaking. Topic areas included how individual perception affected intuitive decisionmaking, and how personal or vicarious experiences attuned their understanding of intuitive decisionmaking.

When participants were asked to describe *intuitive decisionmaking,* the recurring use of metaphors rather than explicit defining terms indicated that at least two issues: (1) the Army definition and key words were not readily accessible in a verbal discussion, and (2) intuitive decisionmaking, in some participant instances, remained an enigma.

Nonetheless, the technique of presenting, discussing, and recrafting questions proved to be a positive development for the revised verbal interview protocol. These changes were subsequently assessed in a pilot interview trial prior to implementation with the purposeful sample. The confidentiality assured by the researcher to the focus group encouraged participants to freely state their belief or uncertainty about intuitive decisionmaking.

Defining the Terms

A struggle to define intuitive decisionmaking arose immediately in the participant dialogues. The researcher noted to the focus group that earlier U. S. Army doctrine said decisionmaking was either analytic or *intuitive*, and presented intuition with about eight or nine descriptors such as pattern recognition, knowledge, judgment, experience, education, intelligence, boldness, perception, and character (*Mission Command*, 2003). Charles [pseudonym] stated simply, "I think we need to find better words. Words do have meaning." Andrew [pseudonym] said, "I don't know if it's actually possible to come up with a clear definition. You can talk around it a lot, and can describe around it a lot, but to pinpoint may be that 'bridge too far'." Later in the dialogue, Andrew added, in jerky phrases, "Well, describing it based upon your experience and knowledge and training, and your life experience–that's what goes into–what makes that intuitive decision–that intuitive factor that comes up kind of like a [flash]."

None of the focus group participants were familiar with the Army definition of intuitive decisionmaking. Comments of the focus group clearly indicated that no common definition of

intuitive decisionmaking existed among these first participants. Defining fundamental terms related to intuitive decisionmaking proved to be an ongoing challenge throughout the research.

Describing the Inquiry

Individual participants offered different ways of stating proposed questions in the interview protocol that made sense to them. The participants readily accepted the opportunity to explore, as noted to them by the researcher, "…something that isn't clearly understood…What about intuition? What is that? And is there a better way–a practical way–to communicate that back into our force [U.S. Armed Forces] and how we react in times of crisis?....Does it make sense to you?"

Ernest [pseudonym] was first to comment and attempted to define intuitive decisionmaking for himself with an example. "You see a fire on the ground, you stomp it out. You didn't think about it. You intuitively realized it's dangerous…OK, now I understand the framework or parameters that I'm to trying to [explore]–the questions to ask." Ernest was able to differentiate between his concept of instinctive conditioned responses and what intuitive decisionmaking might be. He offered, "It's reaction without thought to address the situation….Some of that is going to be habit conditioning, but some of the actions are going to be intuitive."

Charles stated a different opinion on intuition. He said:

Intuition is affected by experience, and experience is *not* [emphasis added] required to have an intuition. A child playing with a ball bounces into the street. His intuition is to go after the ball. [However,] as he gets older and understands that cars are a bad thing and can hurt you, experience tells him that my intuition is valuable before I cross the street.

In the other example where we're putting out a fire, if I've never seen a fire before, I'm still likely to try to stomp it out because there's got to be a "gut reaction" that tells me that that's hot, and hot means bad, and I've got to put it out. Even if I've never seen a fire before in my life, I'm going to react.

David [pseudonym] added to the differing opinions of the focus group. He also appeared to be sorting his own definition of intuition as he declared:

I have a problem with the merits of the term intuitive decisionmaking.…[the] concept is more of a "knee-jerk" reaction. I think of decisionmaking as a deliberate process.

Intuition, obviously, is like an oxymoron, so I don't think that you can have intuitive decisionmaking where you can make a decision like it says in [research question] number two based on intuition. But there are probably examples of both where you react intuitively, and that's different from making a decision based on that [personal or vicarious experience].

Barb [pseudonym] conveyed a counter-perspective as a health care provider and personal lived experience when she said:

I work in health care, and I believe–I think– we *do* use intuitive decisionmaking on a daily basis, at least in how in our world, it has a place…When you see somebody, everything may look "good," but there's just something not–not right. You can't "put your finger on it," but you have to follow up on that for decisionmaking. Do you take them to the lab? Do you hook them up to this monitor? Do I make that phone call [to a head nurse or doctor], or do I wait until I have something solid concrete?

Later in the group session, Barb commented on the confidence to make a decision based on an intuition–a gut feeling. Her intuitive decision saved a child's life. She reflected:

One of the ones [intuitive medical decisions] that stands out the most [for me] was a child that came in that didn't "look right." There was nothing obvious. They [parents and child] were there about a half hour. But he just didn't look right. I'd gone to find a doctor and told him, 'You need to see him–this child [immediately]!' A significant head injury, we ended up life-flighting [aero-medical evacuation to an intensive care hospital] the child. Had I waited to the appointed time–[This was an oral pause with no concluding remark, but the meaning was profound as she looked at the other participants with raised eyebrows, a forlorn frown, and a slightly bowed forehead].

The vignette had a momentary numbing effect on the group conversation accented when one of the participants said, "The hair is up on my neck." Barb broke the silence in a quiet matter-of-fact manner, "Nothing really indicated, at that point, that it [the medical condition] was that significant."

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Charles reminded other participants of the multiple perceptions that intuitive decisionmaking can convey. David said, "I place a lot of value on my experience, so I guess I highly value my intuitive decisionmaking abilities." He affirmed that intuitive decisionmaking is not going to be the same for everybody. Charles suggested that, "This comes back to the discussion "Is intuition experience-based or [are] you… naturally born with it? I would place more value on intuition that I have, or intuitive decisionmaking in a situation that I have *experienced*, than if I have no experience." David was quick to add, "I think, in other instances that I've experienced generally, it [intuitive decisionmaking] has a *negative* impact. And maybe I just had my unfair share of "bad bosses"–[who] questioned anything you don't do "by the book" as being 'What were you thinking?'"

Perceiving from a Story

Of the five focus group participants, Ernest shared the most vivid vignette of an intuitive decision in a combat environment. His episode occurred while commanding an Army helicopter unit in Iraq during the recent war. As he spoke, he appeared to be looking well past any of the participants in the room as if he was reliving his personal experience. In a calm modulated voice, Ernest said:

> As a company commander, there was a typical flight that we'd done many times before on a simple flight plan from [point] A to B. But for whatever reason in this particular time going down the same route, something told me not to go into this area–not another foot. So I chose. We altered course [immediately] and we went around the area. It turns out there was a SA-7 [SA-7 was an enemy man-portable air defense missile team] waiting for us and we could have been shot down. No idea why I thought that. There was no indication that anything showed me that it was there. The intelligence did not tell me that it was there. If I'm wrong, I've had it. [He indicated that he could have been shot down and killed.] Maybe there was something on my mind. Maybe the streets were emptier than normal. Maybe there was less traffic on the streets. Maybe I saw a guy who happened to make eye contact with other people. I don't know.

When Ernest was asked to recall any particular mental image or physical sensation as he made his intuitive decision to immediately divert to a different flight path, he remembered,

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My copilot and I were in a conversation on the intercom [voice intra-communication network], and I remember *distinctly* that I didn't hear him for a few seconds. And I said, '*Stop*. I need to get off [the voice intra-communication] microphone. We need to change our direction [now]. It wasn't anything I thought. It kind of came to me afterwards. I didn't hear what my copilot was saying. I was thinking ahead of the [situation].

A learning point that Ernest emphasized was his sharing those types of gut feelings or "twitches" in social or professional discussions. He said, "Yes…We [aviators] do that a lot. We revolve [discussions] around airport operations [how we "fly"]–helps to prevent doing something wrong. And we stop it [prevent accidents]."

Ernest was able to summarize the focus group dialogue, as he understood it, as follows: You know the interesting thing is that what we're all describing is basically the same kind of thing. We see something. We don't know *why* it's not right, but you know it's not right. You may not be able to sit there and go, 'Wait a second. I don't see people on the street. Or, wait a second. If all the vitals [referring to the example of the nurse's intuitive evaluation of a child patient] look good, but there's something wrong with this guy.' I've seen that. I've seen a doctor do that with one of my kids. He goes, 'Something's wrong!' And, you know, it's good the doctor did something because my child almost died. So, and it wasn't any one thing.

He restated his perception in a simple civilian-like example used frequently in casual discussions of being on dimly lit street or parking lot. This example appealed to the group:
It was sort of like, 'I have a feeling.' And it really comes down to, you know, what we call *intuition*. It's sort of like the feeling I feel [that] 'I better not go down this street just because it doesn't *feel* good.'

Learning from a Focus Group
First, the focus group demonstrated the value of pre-examining the proposed questions prior to their use in the primary qualitative inquiry. A revised list of questions was used later in the pilot interview as another check for keeping a semi-structured interview centered on the two research questions, but flexible to allow inquiry of either personal or vicarious intuitive experiences, or both personal and vicarious experiences.

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Second, several important indicators emerged from the group dialogue for the research on intuitive decisionmaking. Those indicators for further exploration were as follows:

- *Intuitive decisionmaking*, as a leadership concept, was not commonly described in perceptions or understanding by midcareer U. S. Army officers of the focus group.
- *Terms* that describe intuitive decisionmaking in U.S. Army legacy doctrine were not used often by U.S. Army officers in the focus group.
- *Experience*, whether personal or vicarious, appeared to be a precursor to almost all examples cited by the focus group of intuitive decisionmaking.
- *Multi-perspectives* were likely to be a norm in how midcareer U. S. Armed Forces officers perceive and understand intuitive decisionmaking.
- *Mentorship* appeared to be a positive condition for developing personal confidence and self-efficacy in making intuitive decisions.
- *Criticism* by a senior leader, when used as a reprimand and without constructive dialogue for improvement, was a distinct inhibitor for a subordinate leader to take risks.
- *Reflection* on past personal actions was stated as beneficial when linked to critical analysis for improved performance in subsequent similar circumstances.
- *Cues* of what might have prompted an intuitive decision sometimes emerged from participant self-reflection.

The Pilot Interview

The pilot interview was comprised of two U.S. Army majors, one male and one female, who were not members of the focus group or the subsequent main research group of purposeful sample participants. Observations of the researcher and feedback from these participants improved the interview process to be used with the purposeful sample. Questions in the interview protocol were assessed for their adequacy in obtaining the level of response detail desired by the researcher. The logistics of creating a setting for relaxed and candid interviewing was also evaluated. The pilot interview with two volunteer participants provided a pre-experience and increased confidence in how the purposeful sample could be conducted in one-on-one sessions between a participant and researcher.

One officer had experienced one combat zone tours of duty, and the other officer had experienced three tours of duty in a combat theater. Total time in a combat theater of operations

for one officer was one year. The other officer served a total of two years time in a combat theater during three deployments.

Both officers confirmed that *experience*, formal and informal, was a key to gaining the confidence to intuitively act. Alex [pseudonym] recalled a particular experience in combat in Iraq with "The one thing that comes to mind–you know–from an intuitive standpoint and makes me more confident that I'll be able to react in a situation." He continued with the following vignette:

I'm in a pressure situation. I'm confident that I'll make the right decision and that–you know–my reactions will be–I'll be able to react appropriately. Back in Iraq in 2003, I was in a convoy. A convoy that was in front of us that got hit [attacked] pretty bad–and ah–he ah−[the pause and search for words suggested Alex was recalling what he had experienced.] We could see it wasn't a part of our [convoy] element, but we could see that they were in kind of shock. The leadership wasn't doing anything. And there were people injured. So, you know, I reacted. Initially, I was not sure I should get involved–because it wasn't my unit. But I did. And so, you know, it turned out that was a situation where I wasn't sure if I should do anything…We pretty much took control of the situation.

Earlier, Alex had linked his concepts of the *art* of command, experience, and personal confidence with this reflection:

The one thing that comes to mind–you know–from an intuitive standpoint and makes me more confident that I'll be able to react in a situation–I'm talking about the confidence piece….I think the more experience you have and the more confidence you have, your experience and your abilities–I think you're more probably–more confident that your intuition will be accurate. I think you're more apt to make those 'snap decisions" that require intuition. When you're talking about intuition, you're talking about decisions that you don't have a lot of time to react to. You're more likely to *trust* your intuition, if you have that *confidence* and experience.

When asked what prompted him at that convoy attack moment of decision of whether it was something he saw or thought, he paused. After some reflection, Alex answered:

It was more of a–I guess it was both–they had [Alex paused before continuing] wounded guys−and ah–the sense I had to do something now…You know, maybe they're calling

MEDEVACs [medical evacuation helicopters], maybe they're doing this…we took charge of the situation. But even–I guess what I'm saying is even then−it was a situation–even during the whole time I was doing it–I was questioning myself. Should I do this? Should I do this? I was totally going on *intuition*. So, it worked out OK, but it was a high-risk type of thing. So that definitely was a scenario where–that has given me the confidence–so when a similar situation occurs in the future, I've got that *trust*.

The word trust prompted another question by the researcher, "I heard trustworthiness. What about trust?" Alex responded,

Trust in yourself. Trust that you're going to make–you talk about *self-efficacy*−You've got to trust that your decisionmaking–you know–that you're going to make the right decision or at least you're going to apply the–ah–your experience in the best way you can.

Mary [pseudonym] had been listening intently to Alex's comments. As an Army chaplain, her comments offered an interesting mix of metaphor, personal experience, and field-slang. She said:

I feel like–I feel like−I feel intuition falls into the *spiritual*. It would hard for me to "slice with an X-Acto ® knife" between when I have a *sense* or a "gut feeling," and when I feel like I'm being spiritually led to do something. So, I'm not sure–I'll probably be an outlier in your study. I don't know. [Mary followed this sentence with a thoughtful, silent pause, and then continued:]

It interfaces with the things we've already mentioned–training, experience, confidence−breadths of experiences. Maybe you were in a situation where−I'm thinking you had a given timeline invisible in your mind–that if you had seen action happen, you'd have held back. But at that point, somehow in your sense–I mean, that's how it would look to me like. And so, that's a *culmination of experiences*. And so when you [researcher] ask have you had intuitive experience, I think I lead subordinates from a sense of–trying to gauge–their experience level, their know-how, their skill. And so I sometimes don't have "clear-cut" all the answers. I'll just make a decision….I apply experience, and " know-how," and training, but I also–you know−it's kind of my *sense* about things.

Mary captured one of the special cogent principles that surround her personal experience of making intuitive decisions. She stated succinctly, "Leadership is *people work*." A brief time later in the conversation, she described her personal technique. "I've got to apply my know-how and experience, my 'gut,' my intuition−*through* them.

When asked about effectiveness in intuitive decisionmaking, Mary highlighted some aspects with some cautions that she attempted to observe:

When I hear the term [intuitive decisionmaking], I go to maybe a civilian [understanding]. Although I've had 22 years experience in the Army, for me it comes from, and frankly bad intuitive decisionmaking comes from−in my mind−a "knee-jerk," not just as a quick response from a broad spectrum of experience, but quick response from either *very little experience*, or *overconfidence*.

She amplified this comment later in her explanation. "If I were adding on to my definition of 'bad' intuitive decisionmaking, it would either be a lack of experience and or combined with overconfidence, or it might be '*a person who doesn't know what they don't know*'."

The term of *experience* reappeared in the interview even when a question was not directly related to it. Alex introduced something new concerning the way a person is raised and developed that could guide or prompt a decision in a specific manner.

I think something we haven't really mentioned−not to belabor the point, we've talked about training, confidence–all those things. But I think your *values* also–all the way back to the way you were raised as a person−your values are going to greatly influence those type of [intuitive] decisions…You know, you're going to just go with your "gut."

Mary chimed in with words of *character* and *ethics*. "There's a *sense*, and I'll say 'intuition' about what's right for that person." As the dialogue continued, the topic of creative thinking and inquisitiveness prompted Alex to state a connection of critical thinking and risk as follows:

You have to be able to–you know–there's not a "one size fits all" solution, and if you're not willing to "expand your horizons"–you know–and learn about tougher things that aren't traditionally in Army doctrine, then you're going to keep making many of the same mistakes over and over without developing or evolving past that…You have to have that

desire to learn and ask questions, and say, "What about this and what about that? Should we do this? Let's throw this out there." It's not just "Let's get through the [decisionmaking] and follow these steps. It's trying to look at a problem in a different way."

The indication of *risk* perked an acknowledgement from Mary and a linkage of available *time* in which to make a decision.

I think the idea of what was referred to before of our upbringing, our character, our values–I think *risk* comes into all this. When you make an intuitive decision, you are taking risk. Anything on a short timeline, lack of information, not enough time to plan, not enough time to pull all your resources together–the *conditions* in which the intuitive decisions are being made. Sometimes there's a sense we could do more harm than good….That implies *time*. To me, that goes a little bit counter to intuition. Maybe when you're making an intuitive decision, maybe your decision investigates something further. In my mind, when I think of making an intuitive decision, I don't have time to be curious or inquisitive. It's "Bam! I 'gotta' make the decision."

If you "walk back and pick it apart," Mary believed that a person can get at aspects of creative thinking, critical thinking, and the self-reflection. She said this is "the *self-reflection* we've got to do–and how you build that self-confidence, that self-efficacy for the next situation which probably won't be the same. But there may be some similarities. And you may not even be able to identify it." As she sought a better description, she used the image of spheres. These "spheres" were the *conditions* that surround and influence how and why an intuitive decision might be made. "It strikes me that there's spheres in which we make these decisions. For instance, what occurs to me now is the sphere of people. I'm aiming a decision about people. That is one sphere…" She continued after a brief pause, "You might be making an intuitive decision about something on the ground and the mission out there in Afghanistan–Iraq–people–local folks. So, I think those would differ. If I make an intuitive decision about a bunch of "green suitors [people in the military]," that's different."

A subsequent question probed for any relationship they had experienced in being appreciated when acting on their intuition. An undertone seemed to be emerging that the support of an immediate superior was significant in reinforcing or limiting the willingness to use

intuition. One declaration was salient. "Man, they love intuition when it works, and they crush you when it doesn't."

Alex had experienced success acting with intuition, but was also quick to say, "I've worked for bosses–most of my bosses–were very systematic, analytical-type people. They wanted to see a [decision] matrix. They wanted to see how I came up with the solution." In the example he used from his personal experience, he noted that in his opinion, he "probably had the most experience. It was sort of an intuitive process for me. I−ah–it's hard to explain." Alex concluded that in similar professional experiences, "I didn't feel that bosses really appreciated intuition or intuitive decisionmaking."

A similar recollection by Mary raised an issue of how participants might learn effectively from the act of intuitive decisionmaking and its results. In some instances, how to effectively assess intuitive decisionmaking and both internalize and institutionalize the use of it suggested an unfavorable mentoring environment. Mary recalled, "If it goes well, you don't get questioned. Your methodology for coming to a decision doesn't get questioned. It's *only* when a decision goes bad that we want to know "What were you thinking? What was going on?" The feedback she received was less than encouraging when responding, "I had to make a decision quick, and it was wrong. Sir, I did this, this, and this, but at the time it looked right."

Mary summarized her personal appreciation of intuitive decisionmaking as, "I have a "gut sense" of what I'm going to do, and if I have time, we're going to "run those down" [analyze] and try to make sure."

Alex's concluding personal remarks reflected more of an institutional requirement that could offer opportunities for improved intuitive decisionmaking:

> More recently, I don't know if it was in [Army] doctrine before in the leadership [field] manuals, but it's talked about more now−intuition and inquisitiveness. Things like that are important. So I think with the concept of *mission command* [emphasis added], you develop your leaders through training deliberately, but I think emphasis in decentralizing your operation…focus on the person, not technology, but on people and leadership…In a way, they're trying to develop intuition. Just like you develop a person deliberately through training events and field training exercises–[provide] that same autonomy to that captain, the platoon leader, to make decisions on the ground and that type of thing to develop leaders earlier. So, years from then, they have that trust, confidence, and "things"

were they can make intuitive decisions in the confidence that they're making the right one [decision].

Learning from a Pilot Interview Group

The dialogue of a pilot interview with two participants suggested that the questions of the interview protocol were satisfactory for probing an elusive topic of intuitive decisionmaking. Learning by the researcher and the participants was emergent. Doing the interview simultaneously among three people substantiated the value of people actively listening and commenting on each other's perceptions. During the interview process, Mary and Alex exchanged views with each other, and on other occasions spoke directly to the researcher. This three-way discussion encouraged new avenues of inquiry and flexible technique to extract more detail and description as a participant related an intuitive episode. Practice improved an ability to unfold personal or vicarious experience with gradual disclosure.

Tone and climate of a particular oral exchange sometimes offered a surprise statement, the nuance of an oral pause, or the mental impact of a blunt comment. Others indicators of a masked meaning called for more questioning. Casual signals included body language such as a shrug or shoulder tenseness. Being alert and attentive to one participant at a time was informative, but sometimes the interaction required attending to multiple cues. Meaning was not always what was said, but how a comment was said or otherwise communicated.

Other important indicators emerged from the pilot interview on intuitive decisionmaking. Further qualitative exploration was necessary in order to attune to the topics as follows:

- *Intuitive decisionmaking* required a concise and commonly accepted definition among midcareer U. S. Armed Forces officers.
- *Perception* appeared to be a personal expression strongly influenced by what conditions a participant had been exposed to over a long period of time.
- *Uncertainty* was an acknowledged condition that paralleled the concern or apparent inconsequence of risk in making decisions.
- *Overconfidence* was a consideration of what might cause ineffective intuitive decisionmaking.
- *Ignorance* of conditions affecting a situation was a consideration of what might cause ineffective intuitive decisionmaking.

- *Mentorship* effectiveness appeared to be a very important consideration on the positive development of personal confidence, trust, and self-efficacy to make intuitive decisions.

- *Time*−sometimes an extended amount of time−was considered a necessary condition to allow for recurring reflection and learning on past intuitive decisions and actions or inactions.

- *Spiritual values* were considered fundamental, for some intuitive decisionmakers, as a compelling faith-based sense of personal ethics and character.

- *Learning,* from experiences, suggested the need for informal and formal means of feedback− assessment and evaluation−on intuitive decisionmaking in order to improve performance.

The piloting process was an excellent preparation for conduct of the main research study with a small purposeful sample. Insights gleaned from the focus group and pilot interview group were beneficial to how "things"−stated as a generic "catch-all" term by Alex−could be explored and interpreted on participants' perception of intuitive decisionmaking. Comments from both participants indicated that further study of personal or vicarious experiences may lead to an improved understanding of intuitive decisionmaking.

The Purposeful Sample

This research explored intuitive decisionmaking with a purposeful sample of ten U.S. Armed Forces officers. They represented the diverse career experiences of eight U.S. Army officers, one U.S. Navy officer, and one U.S. Air Force officer. A key requirement for voluntary participation was at least one tour of duty in a combat theater. The experiences in combat tours of duty ranged from one officer with four tours, three officers with three tours, and five officers with two combat tours of duty. The U.S. Air Force officer had seven tours; however, the shorter length of an individual Air Force tour accounted for this larger number of combat tours of duty. The Air Force officer's tours equated to a total time of about four and one-half years in combat theaters.

How a participant described personal meaning-making of intuition and decisionmaking exemplified his personal *perception.* A perception appeared to be a process of intercepting cues or clues implicitly from an environment. In some instances after an event, a participant recognized a potential cause and effect relationship. In other instances, a comment heard often was, "I just knew it." Whether through physical or cognitive senses, or a combination of physical

and cognitive cues, this ability to perceive cues in the *conditions* of a particular surrounding environment appeared to be more of an *art* than a science.

Perception was an individual insight that somehow emerged from implicit or explicit indicators, or a combination of both types of stimuli. This dynamic and adaptive individual ability to perceive appeared to occur just prior to an event or while an event was happening. The vignettes and discussion of participants indicated that understanding associated with intuitive decisionmaking may lack a coherent explanation and remain a concept of tacit knowledge and cogent interpretation to decide.

Qualitative Interview Findings

Intuition, as a concept, was described differently by each of the participants. When participants were asked individually if there was one word they could choose to describe intuition, the one word or short phrase they responded with were as follows:

- Gene. "Gut decision. You just know."
- BK. "Immediacy. It's momentary."
- Bruce. "Catching the moment. Go with my gut."
- John. "Body language. 'Couldn't put my hands on it."
- Jay. "Split second. You're looking at the outcome of your decision."
- Max. "Rapid. Hasty. On the fly."
- Karl. "Gut Reaction. Butterflies in the stomach."
- Rick. "Snap decision."
- Sam. "Instinct–something you just know."
- Tom. "Gut feeling. Experience."

A subsequent interview question allowed participants to expand on their personal understanding of intuitive decisionmaking. Table 4.1 presents the 10 responses of participants.

The technique of requesting a concise response was intended to identify if common or diverse perceptions or understandings existed among the participants. The attempt to answer the question, "What is a participant's perception on the phenomenon of intuitive decisionmaking?" resulted in various responses from participants rather than any distinct, definitive description.

Table 4.1 Participants' Descriptions of Intuitive Decisionmaking

How 10 Research Participants described Intuitive Decisionmaking

TOM: It's making decisions based on your "gut feeling." I define "gut feeling" as making decisions you experience from your past, as well as having followed through structured processes, and understand your environment and the end state you want to get to.

BK: I would describe it as those decisions that are made in an unplanned manner. Sort of–maybe "by the seat of your pants" or with a "gut feeling" in which way to go, but no plan to process the decision to make.

BRUCE: It's more the [pause]. It would be [pause]. I would say the amount of time you have to make a decision is compressed somewhat. But more so that there are more unknown factors than known factors. So as a result, most likely, you would have to make–almost–an "educated guess."

JOHN: I think I would describe it as the ability to think "outside the box"–really just the opportunity. Whether it's in a strong environment or atmosphere to take your own experiences–not necessarily associated with what the Army has defined as the right answer in a [Army field] manual or joint pub [publication], and apply those to a situation as you would see fit.

MAX: Intuitive decisionmaking is–hasty–"on the fly." You're decisionmaking a "gut decision" to a situation or problem you come across. Most likely you perceive you don't have a lot of time to react.

SAM: I believe it is a person's ability to use their cognitive abilities to take all the information they have, assimilate it, review it, and make a decision based upon an instinct on what the information is.

GENE: A "yes-no" and "act or don't act" decision not based on anything tangible at the time–more of a "gut feeling" if you will….I do believe it's based on some level of experience. You either have to be told about, or experience for yourself the outcomes or possible outcomes of an event before you can have or make an intuitive decision.

RICK: Just by "going in" and looking at a situation, you can tell whether something is real or fake, whether you can tell when making a decision, who to trust, and who you can't trust. You gather information about people just by looking at the environments–a lot of different things.

JAY: To me, it's something like a decision you try to make pretty much when time is a "short line"–a short suspense, and when you can't go through deliberately all your options, or all your consequences, or what you think will be the consequences, and where relying basically on your knowledge–your experience.

KARL: I would say intuitive decisionmaking is multilayered, multifaceted. That it is a "gut reaction" to some type of stimuli, but that "gut reaction" is also based on our ideals, ethics, morals, and norms that you live your life by. Those things will give you a propensity to "lean one way or the other" in regard to a decision.

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Once again, metaphors were the norm in responses. Nevertheless, participant responses indicated that *experience* was an important aspect for intuitive decisionmaking.

This recurring response suggested the value of the research question, "What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?" Other descriptive characteristics that emerged from the participant's comments were *situational conditions,* compressed *time,* assimilated *knowledge,* and *trust.*

Theme Identification Process

The researcher used a visual graphic display to assist the study and interpretation of findings into themes. However, prior to that compilation of data, several steps were required to reaffirm a credible collection of information. First, the researcher reviewed transcripts of purposeful sample interviews and listened to audio recordings in order to verify what and how particular phrases or concepts were described by a participant. The *coding reference guide* sheet (Appendix H) was the means to manually record researcher notes on insights, possible issues, and meaning. The researcher's impressions from these multiple sessions were compared and contrasted with the *coding reference guide* sheets provided by each of the peer reviewers. The researcher highlighted apparent key common ideas, disparate comments, or anomalies on each guide sheet. On occasion, an impression was discussed with a participant for additional clarification on what was meant in a phrase or comment from the audio record.

Second, the researcher constructed a hand-drawn matrix on oversize sketch paper that measured 36 inches by 48 inches. The left-hand column of the matrix listed each participant by pseudonym. The top row of the matrix was divided into additional columns in three main groups with sub-columns as follows: (1) researcher, peer reviewer, and mentor columns; (2) researcher and peer reviewer assessments; and (3) researcher conclusions and key issues. Collating information on a grand scale in order to focus on researcher and peer reviewer comments was a visual technique that the researcher had used successfully in previous projects.

Third, the researcher filled in his column with bullet-comments from his coding guide sheet and continued the same process with each peer reviewer comment sheet in an adjacent column. The researcher also experienced a tactile enjoyment in working "large" and seeing the thick-tip marker gradually fill boxes of the matrix with boldly printed words and acronyms. A bottom row of the matrix remained clear for final insights and ideas for further research.

Fourth, the researcher looked, relooked, and reflected on these two columns without making any additional marks on the matrix. The value of the matrix information display was

enhanced by self-creating time to "think" before jotting down any assessments. Sharing some initial insights with his mentor, the researcher returned to the matrix-in-progress to assess his own bullet-comments and those he listed previously from peer reviewers in two middle columns. Each iteration of viewing and marking the matrix allowed a more refined picture and more notes and graphic symbols to emerge—literally—of consistencies and inconsistencies and possible meanings or relationships among the information. Patterns started to emerge.

Fifth, the right-hand columns of researcher conclusions and key issues consolidated remarks recorded throughout the matrix process. As the researcher scanned the many matrix boxes of information "nuggets," the colored marking pens he used to highlight interesting comments and assessments created a visible connectivity of color and idea. Words were sometimes exactly the same; sometimes the words or phrases were similar. These ideas merged easily at this point as issues for theme consideration. Nonetheless, some recorded comments seemed odd. Some ideas appeared isolated but worthwhile, such as *overconfidence*.

The completed matrix was compared with thoughts in the researcher's learning journal. This additional personal resource was invaluable in confirming how particular researcher thoughts had been developing over time, and sometimes appeared "suddenly" in the graphics of the matrix. Symbols of arrows, cloud shapes, and circles marked with exclamation points or question marks, were superimposed on the matrix. Other images illustrated ideas. For example, an image of a lens and the concept of marred translucence versus transparency sparked a new line of thinking about perception and understanding. Positive and negative symbols marked issues to discern for theme impacts. One example was a participant comment on *ignorance*.

Finally, the bottom row of the matrix displayed final insights and categorized topics for a list of themes. *Situational* perception and *pattern recognition* were very prevalent in comments. This seemed to be an issue of expertise in a specific domain and the skill set of individual participants. *Self-efficacy* was also prominent in their expressions of personal confidence in crisis to make decisions—intuitive decisions. Recurring *experiences*, with constructive *feedback* from processes such as the Army's after action review methodology, were considered critical to effective professional learning and the development of *domain expertise*. A gratifying sense of cultural and professional *values and ethical behavior* was almost always presented in participants' comments without being prompted by a researcher question. The concept that *intuitive decisionmaking* exists was never in doubt by any of the participants. However, a lack of

participants clearly articulating how U.S. Army *doctrine* described intuitive decisionmaking was very apparent as each participant stated their personal explanation.

After allowing several days to pass before listing themes, the researcher sat down at his desk in the corner of a basement and conducted one final review and reflection. The oversized artifact of a matrix was a compelling "mark on the wall"−literally−of a research project that indicated six themes within the collected narratives and researcher interpretation. These six themes that related to perception or understanding of intuitive decisionmaking were as follows:

- Pattern Recognition in Intuitive Decisionmaking.
- Values and Ethics Effect on Intuitive Decisionmaking.
- U.S. Army Doctrine of Intuitive Decisionmaking.
- Professional Learning with Intuitive Decisionmaking.
- Personal Expertise in Intuitive Decisionmaking.
- Self-efficacy in Adult Learning.

Theme One: Pattern Recognition in Intuitive Decisionmaking

What caused an intuitive decision, in some cases, remained a mystery. However, the concept of pattern recognition−cogent or sublime−surfaced often in the interpretation of how the participants described their experiences in intuitive decisionmaking. For example, Gene expanded on his intuitive decision while piloting a helicopter in Iraq during the recent war. He described the conditions at the time as follows:

> Late 2003. November timeframe. Flying this regular "ash and trash" [routine logistics support] mission. It was me and two of my birds [helicopters]. It was a flight of three. I was the company commander. We were in our primary area of operations−around Fallujah−there was one area in the northeast part of it that never had any strong [enemy] activity, so there was no reason for me to consciously make the decision not to overfly it. But something told me that as we were getting closer to *not* [emphasis added] go over a certain area. So, I had the flight move [suddenly] to the right−turn about 40 degrees to avoid the area. [The result was] No issue. Two days later, an Apache [attack helicopter] flew over that area, and got shot down.

Some sensation had to have been present. When Gene was asked to further describe what was happening as the intuitive decision arose, he remembered that the co-pilot was chattering on the intra-communication system.

Yea. It was the copilot talking–nothing unusual between him, the crew chief, and myself. And there was a situation where as we got closer, his voice became distant. I knew he was still talking, but for some reason I was focusing more on where we were going–more than normal. I said, "Stop [talking]. Turn right." And no question asked. The commander says "turn"–we turn.

I don't remember any sensation. I don't remember any sensation like in your stomach, you know, or "hairs coming up on the back of my neck," or anything like that. It was just a decision that felt right [correct]. So we [I] did it.

In Gene's reflecting on the incident, he recalled there had not been anything unusual in the recent past, but other areas had been "quite hot" [combat actions] with a lot of activity. He mentioned that experience and confidence in your own decisions were important. Nonetheless, Gene was not able to identify the "Why now?–Why then?" [the decision to act]. "You're never truly confident in your decision unless you have some degree of an idea of what is to come from the decision, whether it's conscious or unconscious–from your sub-conscious."

He kept searching for a description acceptable to himself. Gene continued his reflection: So for me, it comes back to some level of *experience*. Not how that relates to my vignette here. Beyond that I could say I'm sure there was an indicator. There had to have been an indicator that I'm just not seeing. It may have been something as simple as, "There are not a lot of people on the road right now. That's not right." I'm not sure.

This led to a brief discussion on an example of camouflage, its intended effects, and the concept of perception rather than being to "cue-in" on what is actually present. Gene noted: You know, *cues* and prompts are important…[With] somebody you know well, you can tell almost instantly there is something wrong. You can tell if they're having a bad day. Just the expression on their face isn't right. Even if you don't know for sure, you can say "You OK?" and that type of thing. And that might be an intuitive…an *intuition*.

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Tom illustrated his concept of intuition and pattern recognition with a tactical example from his personal experience. He commented on an immediate moment of decision, or some kind of a subconscious pre-thought.

> You're making that relatively immediate decision that allows you to make that decision–[it]is all preparation, training, experiences you've had prior to. For example, the first time you get shot at–you know–you are [initially] unaware of it. The sound of "bees going by your head." You're getting shot at. And you think, "What the hell is that?" Then, the next time you hear that sound, you react in a different fashion.

Sam said the following about intuition and pattern recognition. "It all starts with the cognitive, because you assimilate, and it all happens very quickly–at lightning-type speed." He explained the concept as, "It's all the stimuli that you have, and as your brain searches through that, then you basically get to a point where, "OK, this is something that I've seen before–something that I've done before. A series of stimuli causes me to react in this way. And that's when you 'feel it'."

Sam provided sensual impact to his personal experiences as an Air Force officer. He accented what "knowing" means to him with this recollection:

> I actually think, in our case, at least in mine, my reaction time is "cut down" [reduced]. A lot of the time I have to react more than think [deliberate]. I rely more on my intuition than I do on my thinking capabilities. A "quick second" where everything "comes in" [pattern recognition]. You think about it, but then you have to react. And that reaction is, a lot of times, happening *without you even thinking about it* [emphasis added]. So, that's the intuitive part. If I've got a "target to my left," as soon as I assimilate what the target is–then, I already "know" in a sense, what my reaction should be to that. Whether it's going to be right [correct] or wrong, it's my intuition telling me what to do–whether to [decide to] turn or not.

When asked what triggered a particular response while "hunting for IEDs [conducting surveillance for improvised explosive devices] on roadways in a war zone, Sam said:

Oh, it's many things. A broken branch is, for example that something. One time I saw this branch was broken. It cued me." He also offered, "A slight difference in colors–where basically what they [insurgents] had done was spray painted something to look like a rock. But it [the IED] just didn't quite match [the other rocks in the immediate vicinity]. For example, different color. Better than the color–What's dry? What's wet? What's damp? What's drying out right away? Those are things that trigger the response, the "gut feeling" or intuition.

Sam offered an example of inquisitiveness and intuition. "Inquisitiveness means those things that make me question something -- like the light [on an IED detection device]. That's what caught me [my attention]." He questioned himself: "Why did it do that?" This all happened in a "split second," and it didn't exactly flash exactly right. "Why didn't it flash exactly right?"

In other examples, Sam rhetorically asked himself, "Why did the "target blip" [visual signal on the radar screen]? Why did that reflection of light 20 miles away come 'out of nowhere'? What drew me [attracted] to that?" He leaned back and said, "That's your inquisitiveness. That's part of your intuition."

When asked about leaders appreciating intuitive decisionmaking, Sam described a personal experience that was a result of experience in a specific era of technology that younger teammates were not aware of in their professional experience. His vignette recalls his early days in the Air Force:

I used to be able to–in my enlisted [airman] days–I could fix [diagnose] a circuit board just by running my hand across it. And the boss would say, "How did you do that?" [I would answer,] "Well, when I run my hand across it, I could notice the difference in temperatures on a circuit." And we'd run the analysis and that would be the part that would fail [the diagnostic test]. Because it's something that's–it's always some cue–that "sets you off" [cues]. It's not mystical or magic. It's something in your ability to detect that cue. Where somebody would think it's "black magic" or something [mystical]? No. It's just noticing the differences [in temperature] as I would run [my hand] across the circuits.

Whether this was truly intuition or discerning probable cause and effect relationships, Sam explanation of how he "knew" provided additional an instance on the importance of cues:

It's because I learned all of my basic electronics on "old tube stuff" [vacuum tube technology] where you could *look* at the color differences on how a tube glowed, or the *sound* [of the vacuum tube as they warmed up].   Whereas today, the *senses* are not that attuned. So, when you're talking intuitive, you should think "back from your senses" and how you assimilate data.

Max described intuitive thinking in terms of knowledge and confidence. He said, "Intuitive is knowing you've developed your skill set. You've developed your knowledge base, so that way, again, there's some experience. So, you know that it's the "right path." You may not recall why it's right, but it's the right path you "want to go down" [act upon]." He added, "But you know that you maybe know something–maybe–because you know you've learned it before, because you just don't remember at that point."

Max noted that pattern recognition, using an example of camouflage, could be a "two-edged sword." He labored his comments on situational awareness versus situational understanding:

Pattern recognition could be a "double-edged sword." On one hand it's something that you've done or you perceived to have done so the decision is, 'OK. I'll just go ahead and do it.' But if you didn't have all the facts or you didn't see the situation on that initial pattern that might be exposed to you, it might be a totally different situation.

I think, even more now than ever, we are cued into that situational *understanding* as opposed to just situational learning [awareness]. Only ten years ago, there was situational emphasis, and really not until the last five years or so have I really heard the "understanding" piece. But it makes sense that we have these building blocks, and all the data–to information–to knowledge–to an analysis of that knowledge.

When asked why one officer may have a different perception or recognition of camouflage than another officer, John responded on experience and lack of inquisitiveness:

It's probably, again, relating to the *experiences* that he's had. You know, the level of discipline, potentially in the nature of soldiering, going back to the basics, or he just

might not be interested and is focused on something totally different. He does not have time or does not care about the situation because it doesn't impact his priorities.

Max emphasized, "You know, it depends on the situation. There are so many different variables involved in specific instances." John added, "In the military and civilian world, there's a personal aspect to the job that has impact on productivity and things that aren't seen on the surface."

Tom remembered an intuitive experience in Iraq. This incident occurred on the road "outside the wire" [outside the security perimeter of a base]. He described the action:

I was on a FOB [forward operating base]. I was in the forward operations base in the headquarters. I was an intelligence planner for the [number redacted] Division in Afghanistan for Task Force [title redacted]. Being an intelligence officer, there's something very *scientific* and intuition is involved. 'OK, all this data – What does that mean to the boss?' And there were times where we would have a *philosophical* discussion on what to tell the boss. 'Hey, our "gut feeling" tells us that "x" bad guy is going to do "x" bad thing this time.' They lead us some other places. We've done [analyzed] all the patterns. We think it's going to happen here. We don't have any "hard facts" to say that, we just "know" it's [an attack] going to happen if the *conditions* continue the way they are. And if we don't inject something into that situation, it's going to happen. It could happen today; it may happen tomorrow. It's just a matter of time, but we can "neck that window down" [reduce the period of vulnerability].

When asked about the intuitive aspects he experienced versus deliberate decisionmaking, Tom was candid on his *trust* of intuitive indicators in contrast to scientific and "hard" analysis. There appeared to be no sure solution in such a dilemma. He stated:

We sometimes get it wrong. But it's going off that almost "gut feeling" that I "know" there's going to be a suicide bomber coming from this area at this time. Seasonally, it's about right, but while the other indicators are saying, "There's a bomber up here." OK. There was something not right about the conditions, but I can't give you the "traffic" [indications] that say, 'But I 'm telling you that it's going to happen here. Instead you've got to trust me on this, boss.' It goes back to that pool of experiences, that pool of

understanding of the environment that may contradict the hard facts you have available to me…But your "gut" thinks it's going to happen here.

Commenting on how pattern recognition and providing several examples of expert knowledge or knowing as an *art*, Tom said:

If you're used to dealing with pattern analysis and those things, then *pattern recognition* would come. When's the next suicide bombing going to happen? When's the next mortar attack going to happen? Experts watch for patterns to emerge from their analysis. Yet, this indicates observation and perception over time. They're pretty sure what's going to happen. After a certain point in time, the expert says, 'Hey boss, you gotta look at the map. I know it's gonna happen here.' Pattern and trends probably indicate a credible estimate with the analysis.

Tom concluded with a caveat: "He just knows. He's not even looking at the patterns. 'Just knows it this time." Intuition exists.

An example of camouflage was introduced occasionally during the interviews in order to have a participant describe that moment of recognition in what entity was camouflaged. Camouflage was used as a concept commonly understood in the professional domain of all the participants.

In the introduction of the example, a participant may see only a natural setting or might recognize the camouflage. However, if the cues of what really exists do not emerge from the particular environment, the meaning remained hidden. Eventually, the participant may perceive and then recognize the actual presentation regardless of the attempt to camouflage. The reality might be recognized by as individual immediately. The camouflage demonstration was described to a participant as follows:

You see the tree line and something cues and clues you. Something "sets off" that's something is not quite right. Now, there's something different that you "pick up"–you perceive something is masked while some senses are reacting more directly to what you see, smell, touch, taste, or hear. Well, the camouflage net emerges visually from that tree line. That's the whole idea of camouflage."

There would be certain things [perceived] based on experience in particular domains or environments. I'm thinking the Army doctrine that keys on pattern recognition is a support for the idea that cues and clues in a particular instance are important. How do we know intuition better, after the fact, in trying to assess, "What did I learn out of that? What experience did I get out of that "snapshot" decision?"

Karl responded this way, "It's difficult!....What's the expectation?" He continued, "There are certain *patterns*. I'm thinking of a word–*paradigm.* That really sticks out. But when you "get in there," you find out your paradigm was wrong, and there has to be a complete shift to that."

As another example, Figure 4.1 presented a forest scene with natural-looking foliage to further illustrate perception, awareness, and understanding in a specific context.

Figure 4.1 Perception of Cues and Pattern Recognition

Figure 4.1. In this example, trees and underbrush were unremarkable in a natural setting. However, one unnatural or "out of place" cue was a line of man-made wood posts driven equally apart into the ground in the background of the woodland photograpgh.

In Figure 4.1., other perceptions of something amiss were nil. However, if a verbal prompt was provided to look for a sniper somewhere in the scene, the *conditions* of the setting acquired a new perspective of scrutiny for meaning. Camouflage was now expected. Cues to visual patterns of what may be present were perceived differently. Some *cue* may prompt a new

paradigm. (See Appendix K-Perception Cues to Pattern Recognition) to discern the cues and location of the camouflaged sniper.) Something *intuitive* appeared to have occurred.

Karl emphasized the need to recognize something that is amiss. "You can't put your finger on exactly what it is, but you know if you "continue down that path" there will be a dire consequence. I've told my soldiers in the past, "Shake things up... Don't follow the ordinary.""

Rick described similar indicators or clues that he looked for when dealing with military and civilian representatives on military contracts. He said, "It's the combination of a lot of things…When you start showing that you have some kind of intelligence or knowledge about what they're doing, they start acting uncommon and unreasonable."

Rick continued with an example of a contract negotiation meeting as he recalled: "OK, that's kind of odd because I know as a huge corporation you have these things down to the 'nano-cent'." Other indicators were, "You get the blank face; you get the lack of some emotion…OK, something's 'fishy.' Something's not there. We're going to have to try and 'dig in' and do a recount [of contract cost factors and estimates]."

John remembered a situation while a company commander in a logistical unit during Operation Enduring Freedom. Attached to a combat maneuver unit, John's unit was the only unit with females. He assessed the conditions of his work environment with some practical indicators, but had a feeling that something else might be wrong. He recalled:

> I did notice there were some things that weren't right in terms of productivity in the work place, and just a general atmosphere of soldiers in the maintenance section. And I couldn't "put my hands on it." All the feedback from the non-commissioned officers and Soldiers was great, [implying] not a problem. I could tell from statistics that something wasn't going right.

After doing additional examination of conditions and talking frequently with members of his unit, John decided to replace several soldiers and leaders within this section of this unit. Although John qualified this decision as judgment, he couldn't identify any specific reason why he made the decision. He stated a sensing he had: "I can just tell you work with soldiers in the training environment. You go to combat with them. You get to *know* the people–not only what they do in their personal lives–in just general conversation."

Some months later, John was informed what problem had been causing the uneasiness and lack of productivity in his former unit. He summarized as follows: "The senior non-commission officer-in-charge of the [unit redacted] there was sexually harassing some of the females in the workplace. 'Did not know at the time. No indicators at the time. But that there was something not right."

Theme Two: Values and Ethics Effect on Intuitive Decisionmaking

Personal expectations of ethical conduct and the discipline of acting within professional values of what is accepted as good or bad were very evident in the way participants spoke. Values and ethics, in some instances, were directly influenced by a participant's faith system or how he was raised and matured with a social-moral code of just behavior versus unacceptable action.

Karl was very adamant about the importance of values, morals, and ethics and their effect on intuitive decisionmaking. He declared:

> I do believe those are a great determining factor. If a person has a strong, ethical, moral background, they are going to make intuitive decisions that will not violate that. While "on the other hand," someone who has lower or mid-standard morals or ethics, they are going to–I'll put it this way–their basis for intuitive decisions can result in a Mi Lai [a 1968 incident of multiple murders of Vietnamese civilians by U.S. Soldiers in the village of Mi Lai during the War in Vietnam]–a situation where an intuitive decision was made, and it's a poor [criminal] example.

Karl suggested that additional study of moral and ethical conduct by military professionals would be worthy to improve the understanding of how these two aspects affect intuitive decisions. He cited the individual officer who came upon the criminal actions at Mi Lai and took immediate steps, at the risk of his own life, to protect some of the Vietnamese civilians about to be murdered. Karl concluded with what he believes is a determining factor: "The stronger a faith foundation, I think the better the intuitive decision is going to be…In my profession, my belief is they are supernatural granted or removed and there is–there are two sides." He explained what "two sides" meant to him:

There is God and the Trinity. There is Satan and his fallen followers. Both are at odds and they're battling over us. It would be very simple for someone who has a low moral standard or low ethical standard–low foundation in faith–to be influenced on a negative side to still do something. On the surface it may appear very valuable, but in the long run, it is now very consequential on the negative side.

So I think–my background, granted as a minister–even before that, I had a foundation. You must be very careful. Without that foundational background, without the covering, without the protection of God in a person's life and the Holy Spirit indwelling, you are more apt to make rash decisions, intuitive decisions that are prompted from the "evil force," which is very dangerous. Extremely dangerous.

Given this emphatic declaration, the researcher recalled that Karl's life experiences had many paths prior to the interview. In addition to being a minister, he had also been a state police trooper, a military policeman, and an armor [tank] officer in the U.S. Army. Karl had internalized these many vocations while sustaining a fundamental trust in his faith system and personal understanding of intuitive decisionmaking.

Tom made a "gut decision" in combat during a tour of duty in Iraq. He introduced the vignette with the rhetorical question of whether or not to "shoot somebody on the top of the building." Tom knew that this individual was an enemy. He reflected on his actions:

You know, obviously that was "bad guy" by rules all of engagement. Driving down the road, I was a gunner in a HMMWV run [military vehicle convoy] on a MTT [mobile training team]. Rank and grade really don't make a difference when you're a crew on a vehicle.

'Could very easily have shot him and probably killed him–and also 13 or 14 other people in rooms and buildings, or areas around there. [Bullets from the crew-served machinegun would possibly have hit other people too if he had used his weapon.] The "gut feeling" [was] he can't cause me any direct harm. He's not going to cause anybody else in this convoy any direct harm. I can, if I choose, kill this guy. I'll "bring fireballs" [use his machinegun to engage the one insurgent] and create a much larger problem with

civilian causalities. Judgment. Bad guy on the roof–I got him on my video–'Not going to shoot.

Tom explained that "You [had at most] about a 10-second gap to shoot or not to shoot him. I decided very quickly. Looking at the environment there, it would be bad -- I mean the second or third order effects." When thinking about his decision in the interview, he commented, "Ya know, reflecting back on it and looking at the situation–looking at the video footage–looking at the situation and reflecting back on it. But at the time, *there wasn't time* to make that decision."

After describing a hand grenade attack by an insurgent on a vehicle convoy, Jay recognized this particular vicarious experience was a professional learning moment for him. Jay said, "I'd like to think that I'd be able to make a decision–Ya know–when a situation would call for a decision to be made like that. Especially, a tactical decision." The following combat vignette is Jay's description of actions and decisions that were made during the hand grenade attack. This was the most animate portion of Jay's interview.

We were at [location redacted], Iraq, where we had a soldier killed. What happened is–um–They were going through a busy part of town–A convoy of four armored HMMWVs [high mobility multipurpose wheeled vehicles]. And some guy–um–The convoy passed him, and the guy pulled out a grenade. He pulled out a grenade and threw it at the turret [of the HMMWV], got back in his car, and drove away. The grenade exploded. A soldier died.

We found a witness who kind of described the guy. So now everyone was on the "look-out" for him. Two weeks later, another convoy is in the same part of town. What we think is the same guy, pulls out [with his car], comes up behind a HMMWV, pulls out a grenade [and throws it], but misses the [HMMWV] turret. It bounces off the HMMWV, explodes, and does minor damage to the vehicle. At this point, all our gunners [Soldiers in each HMMWV turret with a crew-served weapon]–They all have their "50-cals" [crew-served caliber .50 machineguns] trained on him. This is a busy market place.

There's hundreds of civilians [in the market place]. And they have to make an instantaneous decision. "Do I 'open up' [start firing my machine gun] and kill 20 people to kill one? Or, do I just let this guy go?" And to a man, they all said, "Hold your fire,

Hold your fire." And this guy in the crowd is just watching them [the soldiers in the HMMWVs] and he runs away.

Jay reflected on the actions that could have occurred by any one of the gunners and their leaders in the HMMWVs. The insurgent knew what he was doing. He used the crowd as a protective cover. He knew the norms of how the Soldiers would probably act and restrain themselves from firing their weapons. Nonetheless, the Soldiers' "decision to decide" was *instantaneous*, and demonstrated an ethical basis for the combat decision that an insurgent may not have as a restriction.

When asked about his personal experience with superior leaders and their supporting a subordinate in making intuitive decisions, Gene answered:

I've never had a commander or others that didn't support it. They want you to use your intuition. You're a commander for a reason. We put you in charge because you've shown potential. You shown the ability to make decisions rapidly and soundly, so I've never come across anyone who said, "Well, you shouldn't have made that decision."

In an AAR of course [you might hear such a statement], but very rarely have I observed a [harsh] correction of, "That was a wrong decision." I've encountered situations where it 'could have been a better decision, but the outcome worked out, so we're OK.

Max remembered an instructor in college who posed that a "correct" decision, whatever it is, is having adequate time to decide. The proposition was that the more time you have to make a decision, typically, the more ethical the decision. Max countered with the idea that ethical decisions rely heavily on personal confidence or knowledge that is "stashed away." He believed that, "when the time comes to make that 'gut decision,' you will be able to actually make an ethical decision−a good ethical decision−as opposed to a bad one."

When asked about any contemporary issues that concern him, Max said, "The big thing was the *ethics* thing to me. The fact that we pay "lip service" sometimes in the [ILE] classroom. On military art and science…but now reflecting on it in our discussions, we put a premium on it.

In discussing mentorship, Tom said, "It's good to watch and observe others and see how they go thru the decision making process, how they absorb things, make decisions, we talked about the mentorship or observational role." Mentorship can have positive and negative effects depending on how the professional interaction occurs. Tom expanded on this comment:

You know, you can watch a guy get his face "sandblasted" because he tried to do that [intuitive decisionmaking] not understanding the person that's he's trying to bring that information to−[This] depends on who your boss is. It depends on who you're presenting to, if you're not there presenting in a format they understand, or you're not presenting it in a format that they're willing to adjust to. I can talk to these guys till they're "blue" and they're not willing to listen that day. It doesn't matter. It doesn't matter if I was leading in an intuitive decision form or not.

That's one piece of the observation. If you have a boss or mentor that's very set in their ways and may not be flexible, you're probably going to develop along those same lines or at least with those characteristics. If they're more flexible and adaptive and successful you're probably willing to learn more. That's kind of where I see that. I look at some of the bosses I've had as relatively flexible, out of the box thinkers. Some think they're successful; others [imply], "That's as far as you're gonna go in your career....you know you're done!"

I think it's also the fear in field grade majors. We're coming into a world where−and I've always been an "above the block" [high performance evaluation] checks−when you are rated relatively fairly against your peers. And the system's not perfect. The majors we have now probably have never been "block checked" [massed in the middle of a bell curve probability distribution] till they were a major. Now they realize the risk of adverse [evaluation]−because every single OER [officer efficiency report] counts [is critical for advancement and promotion] as a major because that's the first time you're [really] evaluated. You're probably not going to take some risks, and will stay within a doctrine that says, 'I can do this. My boss wants it this way.' There's very little risk [to take].

Rick noted the value he placed on sharing and listening to others on personal or vicarious experiences. He said succinctly "That's the part of storytelling…Helpful."

Karl expressed an approach to intuition that was quite interesting in his belief that a religious faith system is integral to his personal intuitions. He said:

There is something supernatural about it at times. And more often than not that "gut instinct–gut reaction–gut intuition" is not so much, "I think something's wrong." But from my perspective –my ideology–you could say there is a prompt. And coming from a Christian background as a follower of Christ, it is a prompting, in my opinion, of the Holy Spirit that is saying, "You need to hold on for just a second and look at what I'm showing you. Listen to what I'm saying. Give it a second. There's something "keying" you." I shouldn't say "something." I believe the definitive article is the Holy Spirit is causing you, or allowing you, to see or to hesitate for a split second, and draw your attention from the norm to something that is just out of the ordinary.

He also stated a practical side of his personality and how he assesses that at times might stifle intuition. Phrases such as "show me," "put some corners on it," or "give it to me" were all used to describe this desire for clarity. He said, "There you go. That's it. "Spiciness" [uncertainty] doesn't work for me."

When asked about the influence of role models that might relate to intuitive decisionmaking, Karl mentioned a friend who had just deployed on a combat tour of duty. "Whatever he touches, succeeds! And I don't understand *why*. Is it because he's able to reflect? He has a deeper understanding? He has a far reaching vision and what is it? I don't know." Karl responded to his own questions with a personal perspective:

From my perspective and coming from a Christian perspective, God is directing his steps and he is "in tune with" the will of God and therefore God is blessing him richly. "You can put your finger on this one because you've studied and you've looked into it, and you're wanting to do my will," and therefore, God says, "I'm going to bless you in this regard." To me that makes perfect sense to see that path that his life has been on. That's just the way it's been, and it's always been a blessing not just to him, but to his family, and his friends around him.

The issue of how senior leaders appreciate intuitive decisionmaking raised personal insight and recollection from Karl. His comments were critical and supported by his experiences:

When you propose something that's "outside the box"–sometimes in my experience– there are different commanders who respond differently. And I don't know if that would be part of the intuitive process. Some are very comfortable with the critical analysis–the analytical is lock-step–where as some of the other commanders are more apt to side with the creative stuff. [For example,] "That's something new. Does it work? Yes! Well, I'll keep doing it then."

I do believe there are quite a few commanders out there that would prefer a *creative* style because they know the dangers of being very lock-step, very analytical. [For example,] "This is our [Army] doctrine, this is the way we always do it, this is the way we're supposed to do it, therefore that's the way we're going to do." They're comfortable with that, but "on the other hand," there are all those other commanders who see that and see the danger of it: "This is the result. Therefore, that's what I'm going to do."

With deployments now, the idea from back in the beginning of OIF [Operation Iraqi Freedom] was, "This worked, let's keep doing it." [Some time later] "Well, you can't do it at night." And you start "getting hammered" [attacked by insurgents]. Well, that opinion has changed. Therefore, you have to change. And a lot of commanders will sit there and go, "Yes, we want to change, but we don't want to give the enemy that chance [of success]." But what it really comes down to is that the commanders, some commanders, are not comfortable with giving them [subordinates] that control or power–allowing the freedom of the Soldiers to be creative or even intuitive.

Theme Three: U.S. Army Doctrine of Intuitive Decisionmaking

The U.S. Army doctrinal description of *intuitive decisionmaking* was not clearly understood or articulated by the participants. None of the participants had a cogent explanation of how the Army describes intuitive decisionmaking. Nonetheless, participants recognized that constant inquiry in asking "why?" is very beneficial to eventually making meaning in an instance of intuition and acting with intuitive decision.

An essential gap emerged from review of a U.S. Army doctrine as revised in winter 2011. The U.S. Army rescinded the term *intuitive decisionmaking* (*Mission Command*, 2011). The Army's former definition of intuitive decisionmaking was a group of terms centered loosely on a conclusion using pattern recognition. Additional words in the definition

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accomplished little in describing what intuitive decisionmaking is or how this process occurred. The collective terms of knowledge, judgment, experience, education, intelligence, boldness, perception, and character were not offered in any collective form by any of the participants in their interviews.

The former definition of intuitive decisionmaking had descriptive issues that compounded misunderstanding. To use the word *conclusion* in the definition misses the essence of *intuition*. A commonly accepted definition of *conclusion* is a reasoned judgment (*Merriam-Webster Online Dictionary*, n.d.). *Intuition* has an opposite meaning as "the power or faculty of attaining to direct knowledge or cognition *without evident rational thought and inference* [emphasis added] (*Merriam-Webster Online Dictionary*, n.d.).

The researcher attempted multiple approaches in order to elicit participant perception or understanding of intuitive decisionmaking. In asking participants to think about the concept of asking "why?" in critical and *creative* thinking that emerged often in their discussion, the tact of asking if a concept of *inquisitiveness* related to reflection-on-action and reflection-in-action (Schön, 1983) resulted in encouraging responses. However, some participants expressed diverse personal opinions on the *art* of creative thinking, what learned behavior is, and when to take risk.

Gene was quick and forthright in his understanding. He offered his thoughts in inquisitiveness as follows:

> When I think of inquisitiveness, it relates to thinking. It's kind of the foundation for how detailed or not detailed that you're going to go into your thinking, into your planning, or building a common operational picture in your mind. Those that are more inquisitive are going to be your guys that are your divergent thinkers. There's something we need to pursue further. The less inquisitive are concrete thinkers, or "let's get to the answer and then move on."

Additional concepts of *adaptability* and *flexibility* were also key in perceiving and understanding. Gene accented,

> Key? Absolutely. Especially, in a counterinsurgency environment like we've been in for ten years or so. Everybody knows that our enemy always adapts, so we must. It's doubly so in a counterinsurgency environment where they've [the enemy] a "home court"

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advantage, where they can change their TTP [tactics, techniques, and procedures] at the "drop of a hat," so we need to be able to adapt to their adaptation as readily as they adapt to ours. It's a constant "chess match."

The term *inquisitiveness* received an immediate response from Karl that suggested this concept may be a productive addition to leadership principles and understanding of intuitive decisions. Karl declared:

You need to be inquisitive and you need to ask the questions–not just the simple questions–but the harder questions. And then we need [to explore] those questions with "*Why*?". To me, it almost returns back to early childhood development where the child or children at a very early age are constantly asking, "*Why*?". The older we get, the less we ask *why* because it seems like we become more and more grounded in this reality, this firmness, this foundation. All we can see is the physical realm. While a child is more, "Why does that happen? Why do you do it that way?"

I think General Dempsey's "leaning toward" the idea of how inquisitiveness can open up that creative thinking or intuitiveness. Being inquisitive, I think it's a good thing. I don't think we should ever stop asking, "*Why*?".

Sam was direct and distinctly different in comparing intuition and creative thinking. He stated, "I think creative thinking hurts intuition. Creative thinking presupposes a solution or predisposes an outcome." Realizing value in creative thinking as well as adaptability, he voiced a suspicion that acting on intuition may limit performance at times. "Adaptability means you're conforming to something already predisposed. You've come up [already limited], you've already "bounded" [restricted] yourself, and say, "OK. I have to adapt and fit into this mode." He had developed this outlook based on his experiences in training as an opposing force (OPFOR) analyst. "I can predict what somebody's going to do based on [the adversary's] doctrine [with its norms and expected actions]. In contrast to this viewpoint, Sam posed that intuition is similar to thinking "outside the box." It clears all of those pre-notions and preconceived [ideas], and allows yourself to "go where the signals [cues] send you."

Max compared deliberate decisionmaking and intuitive decisionmaking as "science being the tools that you described before and some of the models that we use like MDMP [military decisionmaking process], where the intuitive is the *art*, kind of molding that knowledge to the situation."

Tom accented that "intuitive decisions are made rapidly. If you're given time to digest things, you're probably going to revert back to one of your more structured processes to get there." He commented with a caution: "And then, in an environment that will allow that would foster [more structure]…You're in a very rote, lock-step [deliberate sequence] environment. There's no reason to do that."

Commenting on Army doctrine and the types of cues that may trigger intuitive decisionmaking, Karl said:

> To use that doctrine term *mission command,* there is a science of command or science for just about anything. There are certain steps you take, but then there's the *art* [of command]. The art does not come from learned behavior or a controlled environment. Sometimes I learned this through experience, but sometimes it is *intuitive*. There is some driving factor within a person that "just moves" them.

Bruce noted that he hadn't personally "come across that terminology in any FMs [Army doctrinal field manuals] when asked about intuitive decisionmaking. He mentioned that Army doctrine in his duties "is full of many "gray areas." There's no right answer; there's no wrong answer." This discussion led to critical thinking and creative thinking. He said, "I think I'm more used to critical thinking than creative thinking…'Try to understand the problem and then come up with solutions to the problem. And then reflecting on upon– "AARing" [after action reviewing]–yourself."

On the concept of creative thinking, Bruce said, "I think the Army discourages it. You have a finite time, so you don't have a lot of time to explore or creatively think of a solution." Although Bruce considered himself more of an intuitive person, he commented that, "I think the Army values more the deliberate decisionmaking because more people kind of understand it." He did caveat this statement with support for intuitive decisionmaking depends to some extent on organizational issues and organizational culture. He provided an example on the willingness or

misgiving to take risk or be intuitive: "It's almost an "ebb and flow." When I feel that I'm in an organizational culture where it doesn't necessarily encourage risk-taking–that you "play it safe"– you'll do well."

An indication Bruce conveyed was that he would be more willing to act on his intuition when it doesn't matter what the outcome of his formal performance evaluation would be. He posed the situation where an officer has already established a high degree of confidence from his senior leader. When this occurs, Bruce said, "I'm more likely to just go with my "gut" and pursue this course of action…It just feels better."

Bruce described personal indicators that he grouped as either emotional or rational. "If I'm calm, I'm rational. If I allow myself to be more emotional, I'm more likely to take that risk and make the intuitive decision, rather than a deliberate decision." In attempting to describe intuitive decisionmaking and how leaders can understand it more effectively, Bruce said:

> I don't know how it's going to make its way back into doctrine. That's the thing. You know, they talk about innovation, innovative leaders, adaptive leaders, flexible leaders. Well, everything we do in doctrine is processes– steps–it's a template. So, how do you have–maybe it's absent from doctrine–*intuitive decisionmaking* as a terminology? How do you?

Theme Four: Professional Learning with Intuitive Decisionmaking

Education on intuitive decisionmaking was described in terms of *training* in realistic military conditions and *professional military education* in institutional programs, such as the Intermediate Level Education (ILE) course at the U.S. Army Command and General Staff College that the participants were attending at the time of the interviews. In addition to class discussions, Gene remembered his training experiences as an observer-controller (O/C) [training mentor at an Army collective training center]:

> I've been an O/C, an observer-controller down at the JRTC [Joint Readiness Training Center], and I would actually know after we had our first meeting–you know, just replaying past experiences to see if I could think of any other examples. A fairly common one, now that I think about it, is a theme during after action reviews. Probed from my peer commanders, "*Why* did you make that decision?"

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[The response was often,] "I don't know. It just felt right." And sometimes it worked, and sometimes it didn't. Now that I think about it, there was quite a bit of intuitive decisionmaking going on whether or it was acknowledged or not.

Gene recognized the learning value of this reflection-on-action when additional questions sought to gain a better understanding of how and why a decision was made. He continued:

The U.S. Army is very good at conducting an after action review (AAR) process so well. When the after action process is done well, the learning process asks, "What's going right? How to we reinforce that? What's going wrong? How do we fix that? And what's your 'top three' and 'bottom three' [technique of focusing on several critical tasks to sustain or improve in future training].

Gene was clearly engaged in reliving his experiences. He was quick to add:

The U.S. Army does the AAR process—and how brutal we are on ourselves. We're "death" on ourselves in the AAR process. It's down-right mean sometimes, but it's purposeful….We all remember that [AAR experience at a Combat Training Center]. The idea "brutal–ruthless." That's what we want. We want to learn those lessons in training, rather than the real environment.

Some comments indicated that effective learning about intuition and decisionmaking in the academic classroom can be easily marginalized. When Sam was asked if he was able to share any of his intuitive experiences in classes at ILE about locating improvised explosives devices along roadways, he noted a problem within certain seminar discussions. "We don't discuss that [personal crisis situations in combat] much in class anymore because we're more concerned about PTSD [post traumatic stress disorder], stress, and stuff like that. So, they [faculty instructors] kind of downplay [do not encourage] all those kinds of experiences in class."

Sam acknowledged the importance of this type of *learning* [emphasis added] with and from members of the U.S. Armed Forces who come back from a deployment, and in most cases, are deploying back into a combat area of operations. He reflected:

It does play a lot into it, in fact, when you go back "in the loop" [the deployment cycle]. Those experiences "play back" [provide knowledge and insight] into your planning

process, and those things as you start planning missions and things like that. I started to "get a feel" [appreciation] for the terrain and the "layout" [situational expectations and norms] in the tactics and stuff like that where "stuff" [attacks by the enemy] would be more likely to happen versus other areas.

Sam, in retrospect, noted, "I have to find a physical or a logical reason as to why I reacted that way. Because I could sit down and say, 'I just felt it,' but that doesn't give you a confidence." To better understand what prompted his actions, he said, "What I had to do with the younger soldiers, is think about what it was that triggered it [my intuition]. [For example,] "The light didn't just blink the exact way," or "That looked a 'little bit different' in color." He knew his practice was to "look for something and I would 'run that picture in my mind' again to try and sort of "like a playback" and figure out what triggered it."

Then, Sam explained why he made a particular decision, so that they could understand and appreciate[the intuition]. Another example he shared had a specific focus and illustrated how to orient to a situational condition. In this instance, cellular telephones were being used by insurgents to trigger the detonation of IEDs. Sam continued:

> While we're "rolling around in full battle rattle" [in a convoy in complete combat equipment and weapon systems], I get a cell phone call. [I answer the cell phone.] And the troop [soldier] goes, "Sir, you just told me this was hostile territory [and using cell phone calls are dangerous in their ability to electronically detonate an IED]." [I told the soldier,] "Well, you have to understand my cell phone works a little bit different than ones the enemy uses." This was a true statement. I was working in a different frequency.

Max recalled conducting an after action review (AAR) process to assess reactions on a weapons range in Iraq. He knew immediate actions were required:

> In Iraq. A piece of shrapnel came off [exploded away from a mine] and did a funky arc [unexpected arc], and actually hit [wounded] the soldier. Of course, when I first heard of the situation, no one would love more than to have the luxury of time to react to something like that. You have to just react.

Max reflected on a personal perspective during those "golden but anxious moments." He was thinking, "I am–I am the leader…It's not necessarily a vain thing, though maybe the outside

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[observer] would think that. But it's more of a *confidence* thing. 'Are my soldiers going to be confident that I'm doing the right thing?'"

Max recalled his own early experiences as an officer and how he matured his confidence in decisionmaking over the years. He recognized the difference between intuition and a guess, and the possibility of making a wrong decision.

I think maybe without thinking–sometimes–you just want to get the decision made without the intuitive piece, as a junior leader. And I know I did. "I got to make a decision. I don't know what the heck the answer is. I don't even have a "gut feeling" on it, but I need to have an answer."

As an officer typically, in which as a lieutenant you "come in" [are commissioned as an officer] and the perceptions of you have to be able to make those decisions. You're the leader, and you have people tell you to rely on the platoon sergeant and stuff. I think we all go through some level of "still trying to jump" [be intuitive] and [instead] just make a rash decision, as opposed to an intuitive decision.

Tom thought of intuition closely linked to creativity, but noted "if you have little or no willingness to use your intuition, your critical thinking and your critical thinking "teach you all day long" [that] 'You can't what?' You just have to "spin it in your computer" and come back with a model answer.

Tom seemed irritated at this outlook as he continued, "That's where I think intuition comes in. To me, based on my skill set and my job and experiences, I do a lot of the critical thinking piece. But once you "step out of that box," do something with it." He encouraged, "Take that piece of analysis and infuse something other than just what was on the paper in front of you."

John had doubts about the general use of intuition by leaders. He said, "I think there is a relatively small amount of leaders that actually think intuitively or apply this decision making. The Army is so structured that we follow a general guideline in every certain situation." He supported the use of intuition. "More intuitively, we need to apply these efforts towards when we "pull back" in a different situation–understanding "*Why*?".

John commented on the value of discussing intuitive decisionmaking in formal military courses such as the Intermediate Level Education (ILE) course at the Army's Command and General Staff College. John said,

> I think we should do more of it. Some of the core curriculum focused in on "How we gotta get to x, y, z," and we've got to make sure that we reach these goals. However, there is some very interesting discussion in class as to whether or not it relates back to our combat experience because it is so relevant in our generation, or you know, pre-911 [prior to terrorist attacks on USA September 11, 2001] training exercises, or even in some personal life [experiences] that will apply to some of the learning objectives. Ya' know?

John noted that in the ILE classroom, much depends on the instructor facilitating the discussion and understanding. "What I mean by that is if there is a conversation that's leading us toward what the learning objectives are, that's kind of developing folks in the classroom–the small group–that wouldn't normally talk about the subject." Sometimes the officer-students were "very hesitant to share their experiences."

Case studies and the analysis in small group seminars [in ILE] were noted by BK as a way to approach awareness and appreciate how intuitive decisions can be determined. He said, "Maybe it starts to form some of your experiences, or at least examples of other people's experiences." He compared inquisitiveness and intuitive decisionmaking as "Ultimately, I think it goes to expanding yourself and *questioning* things….I think one needs to be inquisitive to expand yourself and learn more of what's outside your 'comfort zone'."

While commenting on related perspectives of adaptability and flexibility compared to creative and critical thinking, BK recognized that his personality "…is more of a critical thinker. So, I think to use creative thinking–to think "outside the box" or to think to creatively–certainly has expanded my horizons." In a later comment, he accented that the complexity of options available at any point in time is an aspect to continually probe and challenge. He said, "You try to do that. You rethink, and have to stay flexible–staying inquisitive–and make sure you understand the situation. So, you may to have to use that "gut feeling."

Theme Five: Personal Expertise in Intuitive Decisionmaking

Expertise, in the "voices" of participants, appeared to result from multiple *experiences* and personal and work group *reflection* on the *conditions* existing at varied particular point in time. Gene shared his personal experience of being exposed to improvised explosive devices (IEDs) on his most recent war deployment in Iraq. He qualified:

> For IEDs, unfortunately I have experience with that [IED attack] too. On my last deployment, I was an advisor to the Iraqi Border Patrol. I was "on the ground" [motor-wheel transportation] all of the time. We did a lot of traveling on the roads. The experience the first month you're there, an IED would "go off" [detonate], and you had no idea it was coming. But as you got further into the deployment [tour of duty], whether you avoided it, prayed, or just "knew it was coming." So, you had some sort of mitigator to lessen the damage.
>
> You did sense that there is something about to happen. Whether I can do anything to affect it or not–Don't know. For something a little more obvious, [a cue is] generally there will be fewer cars on the road. You may see indicators like a small mound of dirt. "Heh, I was here three days ago. I didn't see that mound of dirt." This is a little more tangible, so it may not fall into intuition, but may be more a rapid deliberate decisionmaking.

Gene seemed to be thinking of how to be more definitive in his description. He summarized his appreciation of intuition with:

> Back to *experience*. If you don't experience it, you can't have an intuition about it. In a schoolhouse [institutional learning] environment–given the opportunity to fail in a safe environment–and they [CGSC faculty] do a fairly good job–some staff groups do it better than others. Some instructors let them "go down the road." Unless you do the homework, so you can see *why* it went wrong, as opposed to "Stop. That's not going to work." You're never going to learn that way. Otherwise, how do I know "that"?

In another example of experience and intuition, Max used his early lieutenant days in food service, and ordering MREs [meal ready-to-eat rations] for his unit. "How much [food] do

you order?...So, sometimes I can order 10 cases every other day, no problem." He continued to list the unknowns that occurred in fluctuating food requirements and inventory accounting of "When do I "close this out" [stop receiving rations]?" He followed this vignette with a recent experience involving significantly more people and responsibility:

> My experience base is on my previous experience–my lieutenant experience as a platoon leader, with the very concrete decisions that I have to make based on a commodity or two. But now, I have to make a decision on a FOB [forward operating base]. "Do I close this and still have our operational reach to continue doing operations to that particular supply base?"
>
> When the boss first asked me, thinking of "Should we close this base, and still be able to support the troops, and do what I need to do as a commander?" [Intuitively, I responded,] "Sir, yes we can do that." But then I'm rushing back to my TOC [tactical operations center] and I'm saying, "OK guys, should we close this base? Validate and verify that my recommendation was correct. And typically it was.

Max said, "Usually, and I think our bosses, like to know what that "intuitive thought" is because they know it's coming from somewhere….You do qualify, "Well, my 'gut's telling me' yes or no."

Tom used a simple comparison to state his belief that every person has a different ability in perception and trusting personal intuition. "There are some experiences and 'little pockets of things' that are 'popping up.'" You get enough to make the picture and each person has a little more." He recalled a contest of song title recognition. "It's like 'Name that Tune.' I can name that tune in five notes. Some people need 10 [notes]. It's getting to that number of notes in your head. 'I got it.' That's when things start happening."

As a military trial lawyer, BK acknowledged that intuition plays a role in some instances. "I think there've been some decisions I've made as intuitive–without much process– instantaneously." He related that, "Sometimes during interviews or witness interviews−maybe even in panel or jury selections. Even though I think I know which route makes common sense, you kind of go with what your "gut" says to do." As to physical sensations that might suggest an intuition, BK said, "The only thing I can think of as far as the "physical" [perspective] is that disconcerting feeling of "If I give this advice, this is what's going to happen."

Karl shared his appreciation of expertise in the leaders he had worked with and for in previous duties. His personal perspective maintained a faith-based foundation of why particular leaders are more effective than other leaders in using their intuitions. He said:

There are better commanders than others; there are better leaders than others. Those who have practiced the science of leadership–you can tell them fairly quickly. I believe those who have–and I hesitate to use the word–*mastered*, but have obtained a level of artistry in their leadership of command. There's something about the command that people just–their soldiers will do anything for them. There is no explanation for why they're as good as they are. They've all received the same school, they've all received CGSC [Command and General Staff College education] or pre-command course for a brigade [and] battalion [command], but there's something there that sets that person apart–and it's not always experience. There's something else, and I would have to relate that back to some guiding principles within their life or "guiding force" within their life.

Karl reflected that he regularly challenges his knowledge and trust in his personal decisions and intuitions. During his interview, he commented:

It reminds me of the old adage, "The older I get, the dumber I am," because the older I get, the more I realize. When you're at the height of your teenage years, you "know everything." The older you get, the more you realize, "I don't know anything" or less than you really thought you did.

John looked for some type of organizing structure as he summarized his comments on deliberate or intuitive decisionmaking and a linkage to a form of creative thinking. He said:

Every decision that every leader makes has to be tied to some form of *variable* that's going to sway him "left or right," whether in an early stage of that development of variable [options for decision], or whether he has enough confidence after seeing his Army experiences that it's going to work or it's not going to work. I don't think, you know, "I'm just feeling, OK…Let's go right instead of going left. Something out there–I think that's what you're trying to grasp–something has to sway him. It's creative thinking.

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Bruce shared a personal experience that he considered intuitive decisionmaking. Whether a rapid decision with some forethought or intuitive action, Bruce was a leader and the only U.S. Army representative at a critical time and place. The situation was volatile as he arrived for daily duty with an Iraqi division headquarters. He recalled;

I was an advisor to an Iraqi Army division on the general staff. They're just doing their morning [situation] update brief…[I]n this one update brief, there's a lot of commotion going on.

There were incidents down in the city where in three or four places, some of the locals–security forces–were basically attacked at their homes–whether it's just some type of "flash-bang" grenade [noise and concussion grenade without any fragmentation] thrown in a back yard, or a "drive-by" shooting with clearly no intent to conduct an assassination or anything like that. More to just incite fear or harass. And that was the topic of discussion as we came in [to the update meeting].

So, as this meeting is developing , you're starting to piece together from multiple high ranking Iraqi staff officers coming to you saying, "Bad thing. Bad face. Bad." And then finding out my [Iraqi] partner was on leave at the time at his house, and he was getting in [to duty] to deal with the situation. And the same thing–the Iraqi commanding general was being called in. I think−I ah kinda knew–that we had to be involved. This was completely "under the radar" [not known by] of any U.S. forces since no one was "on the streets" [in the neighborhoods of the incidents] and this was Iraqi-on-Iraqi [conflict].

I guess from a decisionmaking point of view, it's when I said, "We need to initiate the [alert notification] chain on the U.S. side–both from the U.S. advisor-side, as well as the brigade that was at [location] at the time. I just felt like–no one told me what to do. You could've just "stayed out of it" [ignored the attack incidents], but I knew this was a situation that potentially could have been explosive [significant political-military implications] in the city and nation. Things could have gone completely out of control, and by the time U.S. forces "caught up" with–or you know, I was the point of–you know, first [point of] contact with the Iraqis. I knew I had to act.

We had a lot of good effects out of that because one of the things that happened was they [Iraqis] knew we were on their [Iraqi] side. So whenever a course of action that the Iraqi security force was going to take–the Iraqi division commander was going to

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take–we were going back'em [support] on it. He [Iraqi division commander] was also getting that from the [redacted senior Iraqi national government office] side, where the [redacted senior Iraqi leader] gave him priority.

A vignette shared by Sam, the Air Force officer, as he described "rolling on the ground" [traveling in vehicles on road routes] conveyed the conditions sometimes surrounding intuitive decisions and the subsequent actions that were required in a combat zone. He recalled:

Well, a lot of times I was supporting the Army, and I would be "hunting for IEDs [conducting surveillance for improvised explosive devices on roadways]. When something would "pop up" [momentary awareness], for example, I had to make "snap decisions" whether that was a possible threat or not.

Because convoys are "running" [vehicles moving along the route] and something is "comin' up" [situational concern as a convoy approaches], it's like, "Oh. Don't stop right now." The drawback of stopping a convoy [can be] is as bad as "rolling on" [a suspected] an IED. [To stop] 'Makes you "sitting duck" [easy target for the enemy]. So, there were a couple of times when you had to make a decision like that. It's just my "gut feeling" that it's not an IED or some threat.

Sam thought about his experiences and assessed his expertise. "I think since I'm older, I started to pay a little more attention to the cues. It's even like the equipment – the actual [improvised explosive device (IED) detection] systems. I could tell sometimes – I could – you can "just tell or feel" [sensation] when the system is not "telling you the truth." Because it's arbitrary. What do you mean? A lot of the systems were used "to jam" [detect and disrupt the electronic signals used to detonate] the IEDs, and they would give you indications. And you'd have to think, "Is that a real indication or is it a false indication?" And so then, you'd have "to feel" that.

Max addressed his perception as follows: "It's a lot of the stuff – it's physical, but I think there's 'brain power.' I think that in the experiences you have already gone through, you 'put it away for a rainy day'."

Sam said, "There are people that I 'feel.' I 'know' when they're around–like my family or my wife. I don't have to hear them or see them, I 'feel'em.' Call it my intuition."

All participants acknowledged that *expertise* is developed over a long period of time. This purposeful sample appeared to align with contemporary literature that suggests expertise takes about ten years of preparation. Depending on the area of expertise, more time may be required to attain expert or master status (Kaufman, S. & Kaufman, J., 2007).

Theme Six: Self-efficacy in Adult Learning

Self-efficacy, for the participants, appeared to be more than just a perceived personal confidence in one's capabilities to organize and effectively conduct an action. Comments from participants indicated that their self-efficacy existed as a combination of thought, decision, action, and recurring reflection-on-action. Bandura (1997) notes a multifaceted causal framework that offers a conceptual domain for such acquired knowledge, implicit and explicit, and its use via:

- Observational learning.
- Exploratory activities.
- Verbal instruction.
- Innovative cognitive synthesis.

Impediments do arise, on occasion, to communicating and gaining acceptance of expertise as evidenced by Sam's experience during multiple tours in a combat theater with new teams of people. Sam said, "What happened is, especially when the new people come in, they tend to downplay everything [take experiences and anecdotes from veterans less seriously]." Another individual response to a dangerous situation was the "indestructible-type" ["can't affect me"] approach."

Sam interpreted this distorted sense of reality in new members of the team thinking as, "'That's really no big deal—sort of a cavalier attitude.' And I got that a lot with the younger soldiers, and even younger officers—almost their feeling of invincibility sometimes as in 'We [coalition forces] get the better of them [insurgents]'."

Notwithstanding, Sam ensured that he discussed "rude lessons" [being mangled-wounded or killed by an IED] with these soldiers and officers as a "wake-up call" before they would "run into" an incident. He stated bluntly, "One of the things that I prided about was that I hadn't "lost a soldier" [soldier killed in combat action], and that's—sometimes—how I dealt with those people. I would grab them—literally have to grab them—and tell them, "Look. I haven't lost one [soldier] yet, and I'm not going to lose one." He didn't.

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In discussing self-confidence, Sam made the following comment in simple language from his personal experience: "The longer you think about it, the more wrong you're gonna be." When queried on whether or not he really believed this statement, he said, "From my experience, the longer you think about it, the more likely you are to talk yourself out of the right [correct] answer." He added, "And it's sort of like what they tell you when you take a test. 'Don't go back and change it [an answer].' From my experience, the longer I think about things, the more wrong I can be."

The concept of self-efficacy did not always emerge clearly for some participants. Jay struggled during the interview to articulate his thoughts clearly; however, he described intuitive decisionmaking "in that 'split-second' thinking…trying to factor in ideas. You know, 'What's going to happen? What are the results of my actions'?"

Max declared that intuitive decisionmaking is used in crisis and in daily operations. In his comments on developing personal confidence in intuitive decisionmaking, he said:

> We [U.S. Army] definitely put a premium on it. I don't think we have to necessarily train to it per se. But your self-confidence, the way that we train, and we're trying to add injects [situational conditions] to our training, like "coming down the pike" [approaching a point along a roadway], or withholding information [creating uncertainty], or throwing in the NBC [nuclear, biological, chemical] environment, or the–You know–all those things. It changes everything dramatically, and then all of a sudden, "OK, now let's take away this formation plan [capability]. You no longer have that. How we going to do it? I think we do it indirectly."

Karl used an example from his past that supported his opinion that distorted personal confidence can be a negative aspect of leadership and intuitive decisionmaking. This form of self-efficacy led to dangerous decisions and outcomes in Karl's experience. Karl recalled:

> [A] former commander–former team chief. Confidence–loads of confidence. He did not believe he could do wrong. He was so confident. But there were wrong decisions. He struggled leading men and men younger than him and older than him. He struggled because I believe his background fostered that confidence, and his career path fostered that from his "first breath" in the Army to that deployment. There was a constant, "My

way. My way. My way. My way. But what about this, and this, and this, and this. You know? No, you don't know what you're talking about. This, and this, and this." There were some dangerous, bad situations, but he was confident he made the right choice. Confidence can be the "smoking gun." It can be negative, so it's got to be very careful on how it's tempered.

When discussing creative thinking and creative thinking as it might relate to intuitive decisionmaking, Karl had a specific viewpoint based on his experiences with other professionals:

A person that is grounded in the physical sciences is very deliberate – very critical thinking. "Guys" [male and female leaders] have that propensity. I'll generalize that. The majority of guys have a propensity to be very critical thinkers. They are linear and analytical and mathematical–just lock-step. There are those that use the "other side of the brain" that are more creative. Does that creativity–the creative thinking–is that part of intuitive thinking? I think it can help. I think it's a factor. But once again, if you're looking for a pinpoint [relationship], that's not "ringing for me." There is in the "back of a person's mind," something's "ringing true." There's a hint there, but I think there is something deeper. The creativity though–not everyone is creative.

As Karl reflected on personal events and vicarious incidents shared by fellow officers on intuitive decisionmaking, "It seems like a stressful situation is one of the key motivating factors for intuitive decisions." This opinion provided a positive recollection of personal confidence and self-efficacy to act on intuition in time critical situations.   He expanded on his opinion with the following statement:

I think one of the things, from talking with others who have been in situations that I would call–where they've made intuitive decisions–they have been the majority of the time in *stressful* [emphasis added] situations. Not where it's been a rapid decision. Not where it's been a decisive decision. It's [where], "I can make this decision now. And this decision, '*Why?*' Because I feel it's the right one."

….They have no reasoning to make that decision. They make it. They act on it. And the next thing you know, things are going well for them, they have averted a

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disaster, or they're in the middle of a disaster. They have now done something that "turned the tables" [on the enemy]. It seems like that stressful situation is one of the precursors to intuitive decisionmaking.

Bruce reflected on his decisionmaking at the Iraqi division headquarters when reports arrived of multiple attacks on security forces homes. The incidents of car bombings were a norm, "but this was pointed at Iraqi security forces, and it was more than harassment. Ya know, like [insurgents saying], "We know where you live Iraqi Army colonel. You need to 'back down' [do not resist the insurgency]. You need to stay home from now on."

Concerning Bruce's confidence in making an intuitive decision, he said, "You know–finding–"catching that moment"–making the right [correct] judgment. You're not in retrospect versus thinking at the time about this and that. I gained a lot. I felt pretty proud that I made the right [correct] decision."

Bruce's senior leader reinforced that personal confidence. His team chief complimented him. Bruce said it this way: "He knew he could trust me, and that if I "made a phone call" [notified the team chief with a critical issue], I had a clear understanding. I had situational awareness. He would trust my judgment."

John expressed an opinion on self-confidence as "I feel 100 percent confident," but offered the following: "Generally speaking, officers who are former enlisted [prior military service as an enlisted soldier or noncommissioned officer] will shy away from that [intuitive decisionmaking] because of second and third order effects of making a bad decision and not following rules or guidelines or getting approval from the boss to do something." John had not served as a soldier or noncommissioned officer before receiving his officer commission.

Tom stated his succinct opinion on self-efficacy: "The more successful you are, the more likely you will express an intuitive decision and use that thought process versus a rigid and structured process." As noted in the introduction of this chapter, Kahneman (2011) would support this supposition conditionally when such self-efficacy is grounded on intuition concerning a regular or similar environment–the *conditions*; is based on the ability to practice often with rapid and *accurate* feedback on action outcomes; and applies developed skill sets for a *particular* domain of experience and eventual expertise. Kahneman is quick to also note that there is

no guarantor of certainty. "Intuitive answers come to mind quickly and confidently, whether they originate from skills or from heuristics….And sometimes they are quite wrong" (p. 416).

Six Themes from Qualitative Exploration

Six themes emerged from the collected narratives of participants. These themes relating to perception or understanding of intuitive decisionmaking by the purposeful sample were as listed in Figure 4.2. The themes indicated that intuition and intuitive decisionmaking was a very personal experience with a grounding in professional principles described in a doctrine.

Figure 4.2 Six Emergent Themes

Six Emergent Themes from the Rigor of Qualitative Exploration

- **Pattern Recognition in Intuitive Decisionmaking.**
- **Values and Ethics Effect on Intuitive Decisionmaking.**
- **U.S. Army Doctrine of Intuitive Decisionmaking.**
- **Professional Learning with Intuitive Decisionmaking.**
- **Personal Expertise in Intuitive Decisionmaking.**
- **Self-efficacy in Adult Learning.**
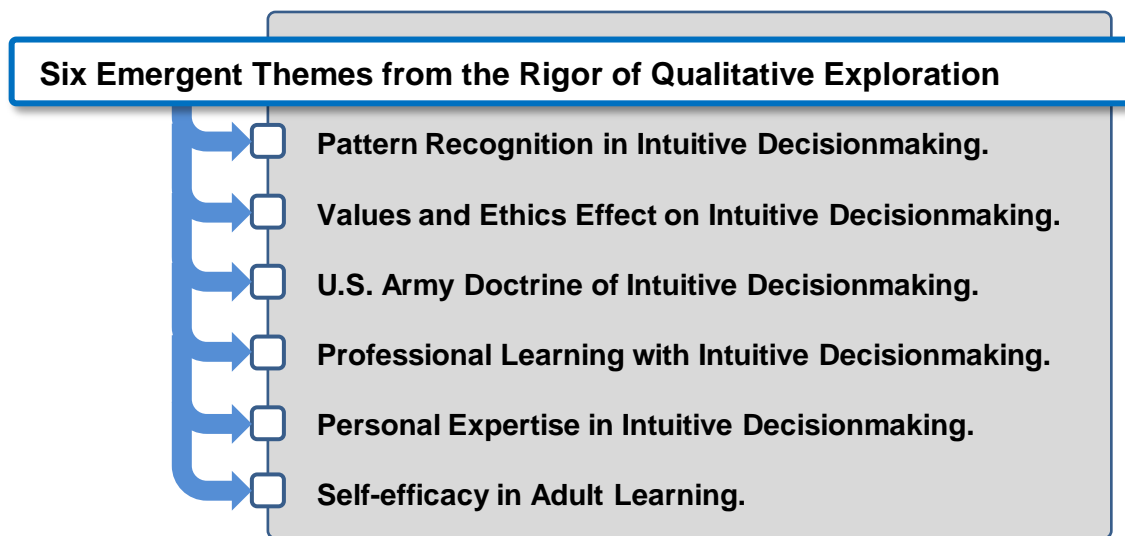
The learning that emerged from the vignettes of participants suggested a long period of development in order to attain the confidence of acting on intuition. This call to action occurred in military and family life crises. The foundations of values and ethics, formed in a particular culture and profession, shaped how the participants perceived and understood their experiences.

Additional Concepts for Qualitative Exploration

Further qualitative exploration was indicated as appropriate on several other concepts related to better understand intuitive decisionmaking. The concept areas were suggested during the research as integral to an improved perceiving and understanding of the phenomenon that appeared to be plausible, but remained beyond the certainty of absolute fact. Concepts were as follows:

- *Intuitive decisionmaking* was not commonly described in perceptions or understandings by the midcareer U. S. Armed Forces officer participants.

- *Terms* that describe intuitive decisionmaking in U.S. Army doctrine, such as *pattern recognition*, were not used often by U.S. Army officers.

- *Experience*, personal or vicarious, appeared to be a precursor to almost all examples of participant intuitive decisionmaking.

- *Perception* appeared to be a personal expression strongly influenced by what *conditions* a participant experienced immediately preceding or during an intuitive decision. In some cases, a participant stated explicit conditions that prompted an intuitive decision. In other cases, a participant was unable to articulate explicit cues.

The effectiveness of *mentorship* by more experienced associates or leaders appeared to be a means for positive development of personal confidence, trust, and self-efficacy in order to make intuitive decisions in a professional domain. Converses of this effectiveness were instances expressed by participants when senior leaders were very critical of intuitive decisions, and reprimanded performance without constructive dialogue for improved performance. This technique created a toxic relationship that clearly inhibited a subordinate leader's willingness to take *risks*.

Multi-perspectives of perception or understanding of intuitive decisionmaking was evident when all interview responses and dialogue were compared and contrasted. Two aspects that affect ineffective intuitive decisionmaking as suggested by participants were *overconfidence* and *ignorance*. Both of these conditions were ways to misunderstand explicit or implicit *cues* of an emergent pattern and the type of intuitive decision that resulted.

Time was considered a necessary condition–often great periods of time–to allow for recurring reflection and learning on past deliberate and intuitive decisions and resultant actions or inactions. *Reflection* on past personal actions or vicarious appreciation of intuitive incidents was stated as beneficial to improved performance in subsequent similar circumstances. *Uncertainty* was acknowledged as a norm in many conditions. On other occasions, participants stated that they "just knew" what to do. Participants commented that *learning* from experiences suggested the need for informal and formal means of feedback–assessment and evaluation–on intuitive decisionmaking in order to improve performance.

Making intuitive decisions within *ethical and doctrinal values* of a military profession was very evident in the "voices" of participants. Personal and professional values were strongly influenced in some instances by a participant's faith system or how they developed and matured within a particular cultural-moral code of conduct.

Adult education on intuitive decisionmaking was described by participants in terms of *training* in realistic military conditions that may require intuitive decisions. Similarly, *professional military education* in institutional programs must provide the opportunity to "get at" aspects of creative thinking, critical thinking, and the self-reflection. One participant said this is "the *self-reflection* we've got to do—and how you build that self-confidence–that self-efficacy for the next situation which probably won't be the same…there may be some similarities. And you may not even be able to identify it."

Self-efficacy, for the participants, appeared to be more than just a perceived personal confidence in one's capabilities to organize and effectively conduct an action. Comments from participants indicated that their self-efficacy existed as a combination of thought, decision, and action. *Expertise*, in the "voices" of participants, appeared to result from multiple *experiences* in personal and work group *reflection* on the conditions existing at varied particular points in time.

A participant expressed self-efficacy this way: "When you make an intuitive decision, you are taking *risk*. Anything on a short timeline, lack of information, not enough time to plan…to pull all your resources together—the *conditions* in which the intuitive decisions are being made*."*

The key points of findings described an avenue of several issues that must be further discussed and researched. A primary finding uncovered a significant disconnect in how intuitive decisionmaking is currently articulated in Army doctrine and praxis. This finding implied that a fundamental requirement exists for additional interpretation of meaning-making on the phenomenon of intuitive decisionmaking by U.S. Armed Forces leaders.

Researcher reflections suggested an essential azimuth that intersected the interpretations by peer reviewers and the participants for the qualitative verification of this research project. The researcher's personal perspective on the exploratory process of qualitative research resulted in qualified observations, opportunity to embed lessons learned in Army training and educational programs, and support operational readiness in Army missions in a complex and uncertain world environment.

Summary

The results stated in this chapter were shaped with two primary research questions. Each of the questions elicited candid perceptions or understandings from a purposeful sample of U.S. Armed forces officers. The responses to the research questions and the profound dialogues with participants presented qualitative evidence that intuitive decisionmaking requires more study.

The most significant finding on participants' perception of intuitive decisionmaking was none of the Army officer participants were familiar with the U.S. Army definition of *intuitive decisionmaking*. Metaphors were the norm in responses from the Army officers, Navy officer, and Air Force officer of the purposeful sample, rather than any concisely articulated definition of intuitive decisionmaking in their expertise domain of military art and science.

The most significant U.S. Army doctrinal impact identified during this research was the winter 2011 version of *Mission Command* (2011) that rescinded the term *intuitive decisionmaking*. The word *intuition* was retained in Army doctrine; however, the rescindment suggested that the act of intuitive decisionmaking no longer existed.

The most significant finding on participants' personal or vicarious experiences contributing to their perceiving or understanding of intuitive decisionmaking indicated that *experience* and feedback with *mentorship* were very important aspects. The concept of pattern recognition–explicit or implicit–surfaced often in how participants described their experiences in intuitive decisionmaking, even though the term *pattern recognition* was not used often by the participants. Participants shared both positive and negative experiences that encouraged or discouraged their willingness to trust personal intuition and a decision to act. *Critical reflection* was implied in the learning that occurred through experiences to build expertise.

Findings and recommendations emerged in this research with an overarching credibility based on three distinct elements in the qualitative process model: (1) credential of the researcher; (2) rigor in conducting the methodology; and (3) a "philosophical belief in the value of qualitative inquiry" (Patton, 2002, pp. 552-553). Patton framed this latter element of philosophical belief as a fundamental commitment to "naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling, and holistic thinking" (p. 553).

Interpretation of participant semi-structured interviews demonstrated qualitative rigor in a replicable manner for qualitative consistency. The vignettes of participants were illuminated with

their own vivid recollection of an experience and presented in the contextual domain of a particular time and location.

Perceptions were frequently conveyed in language and field-slang familiar to their professional domain. Such descriptions sometimes required additional questioning to ensure a common understanding of the terms and their meaning. These clarifications were often embedded as editorial comment to a verbatim transcript of a participant.

Another interpretive consideration was how a participant might recall an experience that in fact was inaccurate in the reality of what actually occurred. Notwithstanding, the techniques of triangulation and constant comparison among a participant, selected subject matter peer experts, and researcher indicated a qualitative trustworthiness of a participants' recollection and qualitative meaning-making from their personal or vicarious experiences.

Chapter 5 presents implications and recommendations for future research and orients avenues of inquiry for improved perception and understanding of intuitive decisionmaking in the U.S. Armed Forces, and an encompassing environment for progressive learning and adult education.

Chapter 5 - Discussion

We have to understand the *significance* [emphasis added by Dewey] of what we see, hear, and touch. This significance consists of the *consequences* [emphasis added] that will result when what is seen is acted upon.

<div align="right">Dewey</div>

Introduction

This chapter presents a discussion on a qualitative bounded case study that explored the phenomenon of intuitive decisionmaking. A purposeful sample of ten U.S. Armed Forces officers volunteered in 2011 to share their personal or vicarious experiences concerning intuitive decisionmaking. Insights gleaned from their "voices" conveyed a "thick and rich" explanation of *what* they perceived and understood as intuitive decisionmaking. Participants provided individual instances that helped to identify *cues* prompting an intuitive decision. Additionally, participants described a continuing quest to understand *how* a particular intuitive decision occurred.

This chapter's epigraph by John Dewey suggested that physiological stimuli become significant when it informs our cognitive ability to *learn* from experiences. The evidence from this research indicated that this type of learning can remain implicit; be explicit in ready-recall for a decision; or seem emergent as an instantaneous awareness and situational understanding. These three perspectives were interwoven throughout the participants' narratives as they attempted to rationalize *how* decisions and actions occurred in a specific intuitive experience. The participants acknowledged that intuitive decisionmaking was clearly an expectation in their leadership roles during future complex, uncertain, and dangerous military duties. The consequences of intuitive decisions, in the real-world of the participants, had occurred often in a context of life or death outcomes in time sensitive situations.

But as a metaphor, Kahneman (2011) illustrated there are issues that haunt intuitive decisionmaking. When time was available, reflecting before taking action can make "good sense" as follows:

> My intuitive thinking is just as prone to overconfidence, extreme predictions, and the planning fallacy…I have improved only in my ability to recognize situations in which errors are likely….recognize the signs that you are in a cognitive minefield, slow down,

and ask for reinforcement [deliberate thought]….It is much easier to identify a minefield when you observe others wandering into it than when you are about to do so" (p. 417).

Kahneman's (2011) comments accented his belief that intuition exists but can be problematic. When time is available in crisis and unexpected situations, he complemented intuition with reflection and deliberation on causal conditions; the general conditions of a particular environment; and the relative expectations of success, failure, or the unknown based on his experience. He believed that the *trustworthiness* of an intuition should be evaluated with "whether there was an adequate opportunity to learn the cues, even in a regular environment" (p. 243). Klein stated that "intuition is how you turn experience into action (2003, p. 293). Nonetheless, both Klein and Kahneman agreed that although using intuition or heuristics for judgment can lead to questionable results, they agreed that validity and uncertainty are not incompatible (Kahneman & Klein, 2009). While there appeared to be no absolute guarantee of successful solution with intuitions, can the ability to act on intuition be improved or become more explicit?

The Problem in Review

The essential nature of the problem was unequivocal to participants. The U.S. Army expected its leaders to use both analysis and intuition for decisionmaking in their leadership duties and responsibilities as a doctrinal norm. As of 2011, the contextual setting of their real-world was within the complex and uncertain environment of contemporary military missions and their own lifelong learning.

Studying the principles of U.S. Army doctrine in recent years (U.S. Department of the Army, 2003, 2006, 2008, 2010, 2011) indicated the requirement for simple and articulate military language and terms for training and educating leaders in intuitive decisionmaking. Studies in recent years by the Army's Research Institute for the Behavioral and Social Sciences (ARI) (2000, 2001, 2002, 2005, 2007) suggested a need for more research on intuitive decisionmaking.

Notwithstanding, a significant issue about intuitive decisionmaking emerged in late 2011 with the revision of Army doctrine on mission command. Army Field Manual (FM) 6-0, *Mission Command* (2011) officially rescinded the Army term *intuitive decisionmaking*. However, the

same doctrinal publication retains and emphasizes an explanation of intuitive decisionmaking in its discussion on the *art of command* and its use by today's Army leaders.

The companion Army doctrinal publication to mission command is the *Commander and Staff Officer Guide.* This doctrine states, "In extremely time compressed situations, commanders rely on more *intuitive decisionmaking* techniques, such as rapid decisionmaking and synchronization process" (RDSP) (Army Tactics, Techniques, and Procedures (ATTP) 5-0.1, 2011, p. 4-4). Examination of the RSDP qualified that this process was not an intuitive action.

This dichotomy of denying the existence of the term *intuitive decisionmaking*, and then using intuition as an integral aspect of leader decisionmaking was a key doctrinal issue affecting the implications and recommendations in this dissertation.

Prior *experience* played a key role in effectively making intuitive decisions in order to "to elicit the *cues* and contextual considerations influencing judgments and decisions" (Kahneman & Klein, 2009, p. 517). Cues were associated by participants with pattern recognition in particular−*contextual*−situations. Klein (1998) accented that experiences are important in the formation of expertise and that "expertise depends on perceptual skills" (p. 287).

Research Questions as Catalysts

Research questions probed participants' perception or understanding of intuitive decisionmaking. The two main exploratory research questions were as follows:

- What is a participant's perception on the phenomenon of intuitive decisionmaking?
- What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?

Personal Reflections of the Researcher

I was and am an American Soldier. In these personal reflections, I allow myself a temporary distance and vantage point from the neutral third person term of *the researcher*. I retain full responsibility for this study as the researcher. I add a brief retrospective of how my perspective of intuition, experiences, and lifelong learning may have affected this research.

Living and Learning

My entire adult life has existed in the context of a proud profession of arms−the U.S. Army−grounded in duty and selfless service to the Nation. Studying military art and science throughout my university undergraduate years, I earned a Regular Army commission upon graduation from a civilian university as an officer in the United States Army. As a young man, I made this voluntary commitment knowing that conditions would often be complex and potentially very dangerous. Tours of duty in the continental United States and abroad in over 20 different locations over a 30 year career shaped a lifestyle and myriad experiences for my family and me. As a child, I had always dreamed of being in the Army. I lived my dream, and today, continue to live and serve in ways that support *my* Army.

The fundamental principles of this profession of arms expected proficiency, readiness, and a values-based excellence in action. Thus began a leadership journey spanning over four decades with many paths still to be explored in future days, years, and decades.

Constant questions tugged at my personal and professional confidence when contemplating dangerous situations that might occur in life's adventures and military missions. Examples of such questions were as follows: "How will I really act in crisis? Will I make the right decision? Should I act on my intuition?" This dissertation research continued that compelling lifelong commitment to seek the answers to what I *think* I know about myself, but may not be able to prove until a particular moment of crisis. If an intuitive decision appears, I keep asking myself, "Am I to *trust* my personal intuition?"

Discussion

Discussion on Research Question 1: Perception of Intuitive Decisionmaking

Discussion on the perception of intuitive decisionmaking and understanding of the concept considered three primary topics. Those areas of interest were as follows:

- Emergent Army doctrine on military decisionmaking.
- Doctrinal definition of the term intuitive decisionmaking.
- Conceptual framework on intuitive decisionmaking.

U.S. Army Doctrine

A glaring issue appeared during the research in late 2011 when a revision to Army doctrine rescinded the term *intuitive decisionmaking*. The description of intuition as part of military decisionmaking processes appeared vague and was not well integrated as a concept into current Army doctrine.

Army doctrine was the fundamental institutional guidance to participants on intuitive decisionmaking. These principles for action in training, education, and operational experiences codified Army decisionmaking processes. The U.S. Army stated: "Doctrine is not prescriptive. It provides the common centerline from which innovative leaders adapt to achieve the mission. Doctrine provide[d] leaders with the intellectual tools necessary to diagnose unexpected challenges and develop practical solutions" (*Doctrine for an Army*, 2012, para. 19 and 20). No definition of intuitive decisionmaking widened a significant gap in the explanation and understanding of published Army doctrine on intuition and decisionmaking in 2011.

The U.S. Army has been in a period of the most significant changes to its doctrine in decades. The Army's *Doctrine 2015 Strategy* noted major changes such as recategorizing doctrinal publications, reducing the length and number of publications, and adding digital media capabilities for easy access to information ("TRADOC discusses," 2011). In 2011, some field manuals (FM) remained current, but other publications such as Army tactics, techniques, and procedures (ATTPs) were being phased out and integrated into other publications. For example, doctrinal literature included at least four new or revised groupings with specific purposes:

- Army doctrine publications (ADPs) that state fundamental, enduring principles.
- Army doctrine reference publications (ADRPs) that elaborate on doctrinal principles.
- Army field manuals (FMs) which describe doctrine and procedures but not techniques.
- Army technical publications (ATPs) which discuss techniques.

As this dissertation was completed in early 2012, the U.S. Army was reviewing several of the key doctrinal publications at Headquarters, Department of the Army (HQDA) and the Army Publishing Directorate (APD) for approval and distribution. Once FM 6-0, *Mission Command and the Operations Process*, is officially approved for publication in 2012, what definitional and descriptive gaps that still remain will be apparent.

Doctrinal Definition Gap

None of the participants in the small purposeful sample of this study stated a definition of intuitive decisionmaking similar to the definition in a legacy ATTP 5-0.1, *Commander and Staff Officer Guide* (September, 2011). The definition during the previous decade had been as follows:"Intuitive decision making is the act of reaching a conclusion which emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character" (*Mission Command*, 2003, p. 2-4). When the September 2011 legacy publication of FM 6-0, *Mission Command* rescinded the term *intuitive decisionmaking*, the same field manual still referred to blending intuitive and analytic decisionmaking for timely and effective decisions, and used a definition of intutive decisionmaking even though the term had been rescinded. As of early 2012, revision of Army doctrine on decisionmaking remained a study in progress.

From the perspectives of participants, *experience* was an important aspect affecting intuitive decisionmaking, but suggested an intuitive decision may not be based on anything tangible. As participants were asked to describe intuitive decisionmaking in one word or a short phrase, a sampling of terms voiced by participants was as follows:

- Immediacy.
- You just know.
- Gut decision.
- Momentary.
- Catch the moment.
- Go with my gut.
- Rapid–hasty.
- Split second.
- On the fly.
- Butterflies in the stomach.
- Snap decision.
- Gut feeling.
- Instinct.
- Experience.

Other descriptive characteristics that emerged from the participants' comments related to *situational conditions*, compressed *time*, assimilated *knowledge–tacit and explicit*, morals and *ethics* as embedded personal and cultural influences, and *trust*.

Doctrinal Concept Gap

The lack of a consistent description of *intuitive decisionmaking* by the participants in the small purposeful sample of this study indicated that the concept of intuitive decisionmaking was not clearly understood by these participants. All of the participants used metaphors in their responses about intuitive decisionmaking. They all believed that intuitive decisionmaking existed, but a concisely articulated description of intuitive decisionmaking was not evident. As a fundamental concept in their professional expertise of military art and science–at least as previously defined by Army doctrine–this lack of consistency indicated a significant doctrinal concept gap. This gap was counter to an Army doctrinal expectation stated in a legacy Field Manual 6-0, *Mission Command* (September, 2011): "By establishing a common approach and *language* for mission command, doctrine promotes mutual understanding and enhances effectiveness during operations" (p. vii).

This research suggested the requirement that intuitive decisionmaking be *re*established as an Army doctrinal term and be described in doctrine with a clear and concise explanation of how intuitive decisionmaking and deliberate decisionmaking complement each other in the Army's military decisionmaking processes. Traditionally, intuitions and analytic considerations were accepted perspectives in developing expertise. When the *U.S. Army Learning Concept for 2015* was published in 2011, the concept required an improved Army learning model to "expand and deepen their [Soldiers and leaders] cognitive, interpersonal, and problem framing skills essential for operational adaptability" (p.15). Futhermore, this emergent Army learning model expected critical and creative thinking, mental agility, flexibility, calculated risk-taking, and innovative solutions to problems. Without a renewed emphasis on the synergy of intuitive–*tacit*–and analytic knowledge, achieving the training and educational standards of the learning model seemed a doubtful aim. Of the 25 required capabilities stated by the U.S. Army for this learning model, the concluding capability stated: "The Army requires lifelong learners who are creative and critical thinkers with highly refined problem solving skills, with ability to process and

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transform data and information rapidly and accurately into useable knowledge across a wide range of subjects" (p.59).

One of the participants noted that inquisitiveness was worthy of consideration in a leader's responsibility to *think*–critically and creatively. He said, "It's kind of the foundation for how detailed or not detailed that you're going to go into your thinking, into your planning, or building a common operational picture in your mind."

Understanding intuition also appeared to have connections to Army terms of *adaptability* and *flexibility*. When asked about this relationship, one participant stated:

Key? Absolutely… Everybody knows that our enemy always adapts, so we must. ..where they [enemy] can change their TTP [tactics, techniques, and procedures] at the "drop of a hat," so we need to be able to adapt to their adaptation as readily as they adapt to ours. It's a constant "chess match".

In considering how to expand and improve a doctrinal concept in order to perceive and understand intuitive decisionmaking, another participant commented: "You need to be inquisitive and you need to ask the questions–not just the simple questions–but the *harder* questions. And then we need [to explore] those questions with '*Why*'?".

Participants expressed their personal or vicarious *experiences* as contributing to their level of perception and evolving appreciation of intuitive decisionmaking. Professional literature reinforced this appreciation. Kaufman and Kaufman (2007) summarized that developing expertise–in their research of expert writers– took participants about 10 years to reach "expert" status. They cited the possibility of three phases of development: becoming technically competent; developing competencies to expertise; and advancing from expertise to a higher level of artistry. However, they stated that their findings of a "ten year rule" were not conclusive in their study. They also pointed to an observation that for truly creative fields of endeavor such as the arts, expertise alone may not be sufficient, and time to develop artistry may take more than 10 years to appear.

The Patel et al. (2008) study documented that text-based [doctrinal] guidelines were important for training and educating medical triage; however, experienced nurses felt *confident* in using intuition and heuristics when time was a premium and immediate decisions were required.

Novice nurses used the published guidelines in caring for patients. They realized that professional guidelines were a baseline for action, and that with expanding experience would be adaptable to nuances of personal experience and expertise.

The participants of this study with U.S. Armed Forces officers indicated that a doctrinal concept exists, but required improvement. They also acknowledged that intuitive decisionmaking operated in a world that continues to present ambiguous, uncertain, and complex situations. Sometimes, they noted that these conditions must be visualized immediately.

Research Question 2: Personal or Vicarious Experiences and Intuitive Decisionmaking

Discussion on the effect of participants' personal or vicarious experiences indicated several areas of interest that impact on their understanding of intuitive decisionmaking. Most comments by participants were very positive in how they used intuitive decisionmaking. However, some participants identified conditions–such as "toxic leadership"–that were detrimental to their willingness to use intuition in implementing actions.

The main areas of interest expressed by the participants were as follows:

- Professional self-efficacy and expertise.
- Professional ethics.
- Professional institutional and operational experience.
- Critical reflection and creative thought.
- Confidence in a complex world.

Professional Self-efficacy and Expertise

Participants described self-efficacy in terms such as *confidence* and *trust*. Their professional expectations on using intuitive decisionmaking combined opportunities of *training* in realistic military conditions that required intuitive decisions, and *professional military education* in institutional programs that provided situations to simulate dilemma and make decisions with a credible feedback system for iterative learning. Both environments demanded that participants be effective deliberate and *intuitive* decisionmakers. Self-efficacy in their domain of expertise–a set of functional military competencies, skills, and attributes–was personal to each participant.

Leader Self-development

Self-efficacy, for the participants, appeared to be more than just a perceived personal *confidence* in one's capabilities to organize and effectively decide on and conduct an action. Comments from participants indicated that their self-efficacy existed as a combination of thought, decision, and action. Expertise, in the "voices" of participants, appeared to result from multiple *experiences* and personal and work group reflection on the conditions existing at a particular point in time. One participant expressed self-efficacy this way: "When you make an intuitive decision, you are taking *risk*. Anything on a short timeline, lack of information, not enough time to plan…to pull all your resources together−the *conditions* [emphasis added] in which the intuitive decisions are being made. "This participant seemed to be saying that intuition was a personal capacity for immediate insight and confidence that you "just know."

Kahneman (2011) shared an example of "easy learning" versus skilled expertise: "A young platoon commander with no experience of combat will tense up while leading troops through a narrowing ravine because he was taught to identify the terrain as favoring an ambush. Little repetition is needed for learning" (p. 238). Kahneman stated that two basic conditions must be present for acquiring a skill and evaluating the validity of an intuitive judgment (p. 240):

- An environment that is sufficiently *regular* [emphasis added] to be predictable.
- An opportunity to learn these regularities through *prolonged* [emphasis added] practice.

Recurring experiences seemed to imprint practical indicators of cause and effect, but sometimes self-efficacy and domain expertise appeared *tacit*. One of the participants assessed his expertise this way:

> I think since I'm older, I started to pay a little more attention to the cues. It's even like the equipment – the actual [improvised explosive device (IED) detection] systems. I could tell sometimes – I could – you can "just tell or feel" [sensation] when the system is not "telling you the truth." Because it's arbitrary. What do you mean? A lot of the systems were used "to jam" [detect and disrupt the electronic signals used to detonate] the IEDs, and they would give you indications. And you'd have to think, "Is that a real indication or is it a false indication?" And so then, you'd have "to feel" that.

Self-efficacy

Army Field Manual 1, *The Army*, amplified the responsibility for *self-efficacy* and adaptability in adversity. "Leadership demands action–the self-discipline to do what *feels* or is *known* to be right. Army leaders must act in both immediate conditions…complex and dangerous, and in the long term where effects of decisions may not be readily apparent" (2005, p. 1-19).

A participant reminded himself that impediments do arise in developing effective self-efficacy. He recalled his experiences during multiple tours in a combat theater with new team members who were less experienced. He said, "What happened is, especially when the new people come in, they tend to downplay everything [take experiences and anecdotes from veterans less seriously]." He categorized this distorted appreciation of conditions as an indestructible-type ["can't affect me"] approach. The participant discussed "rude lessons" [being mangled-wounded or killed by an IED] for such soldiers and officers as a "wake-up call" before they would "run into" an incident. This participant stated his experienced viewpoint on self-efficacy as follows: "The longer you think about it, the more wrong you're gonna be. From my experience, the longer you think about it, the more likely you are to talk yourself out of the right [correct] answer."

Another participant described his confidence–his *self-efficacy*–even if he could not always explain his confidence explicitly as follows:

Knowing you've developed your skill set. You've developed your knowledge base, so that way, again, there's some experience. So, you know that it's the "right path." You may not recall why it's right, but it's the right path you "want to go down" [act upon]." He added, "But you know that you maybe know something–maybe–because you know you've learned it before, because you just don't remember at that point."

This comment by a participant's confidence sounded very similar to Bandura's (1997) concept of self-efficacy as a perception on "one's ability to organize and execute given types of performances" and "how well they will be able to perform in given situations" (p. 21). Self-efficacy promoted adaptability to particular circumstances. Participants understood that when an individual is tired, undernourished, or otherwise fatigued, decisionmaking is much less efficient than being intuitive in an unstressed set of conditions. Goldberg (2005) assessed similar outcomes in his research.

Professional Ethics

The *Army Ethic* has promoted the positive aspects of what is exchanged and learned in mentorship between an expert and a novice. Characteristics of this ethic included "shared values, beliefs, ideals," and other principles such as ethical reasoning and decisionmaking" (*The U.S. Army Learning Concept for 2015*, 2011, p. 41). Notwithstanding, the emerging themes from the 2011 Army Profession Campaign indicated that codifying what it means to be an "Army profession" has yet to be "universally shared and understood across the force [U.S. Army]" (*The Army Profession*, 2011, p. 34) .

Values and ethics, in some instances, were directly influenced by a participant's faith system, or how he was raised and matured with a social-moral code of just behavior versus unacceptable action. Values, morals, and ethics appeared to have an effect on intuitive decisionmaking. One participant stated:

I do believe those are a great determining factor. If a person has a strong, ethical, moral background, they are going to make intuitive decisions that will not violate that. While "on the other hand," someone who has lower or mid-standard morals or ethics, they are going to–I'll put it this way–their basis for intuitive decisions can result in a [criminal act].

When intuitive decisions were introduced by participants in the research as an ethical decision, each of the participant vignettes affirmed actions that were just and correct within the norms of U.S. Army professional values and the expectations of a commissioned officer representing the United States of America. The voices of participants suggested that their duty and actions were honorable and performed within *legal* allowances and restrictions, and a personal *moral* code. These actions aligned with current expectations of trustworthiness in the Army ethic: *Trustworthiness* is the positive belief and faith in the competence, moral character, and resolute commitment of comrades and fellow professionals that permits the exercise of discretionary judgment" (*The Army Profession*, 2011, p. 21).

In one example, a participant recalled being in a market place in a combat zone with hundreds of civilians. His instant response to identifying an enemy insurgent who had just thrown a grenade at a convoy was, "Do I 'open up' [start firing my machine gun] and kill 20 people to kill one? Or, do I just let this guy go?" And to a man, he and other vehicle gunners

shouted, "Hold your fire, Hold your fire." The soldiers' "decision to decide" was *instantaneous*, and demonstrated an ethical basis to shoot or not shoot in a specific situation.

One participant shared his appreciation of expertise in the leaders he had worked with and worked for in previous duties. His personal perspective maintained a faith-based foundation of why particular leaders are more effective than other leaders in using their intuitions. He said:

There are better commanders than others; there are better leaders than others. Those who have practiced the *science* of leadership–you can tell them fairly quickly. I believe those who have–and I hesitate to use the word–*mastered*, but have obtained a level of *artistry* in their leadership of command. There's something about the command that people just– their soldiers will do anything for them. There is no explanation for why they're as good as they are. They've all received the same school, they've all received CGSC [Command and General Staff College education] or pre-command course for a brigade [and] battalion [command], but there's something there that sets that person apart–and it's not always experience. There's something else, and I would have to relate that back to some guiding principles within their life or "*guiding force*" [emphasis added] within their life.

Professional Institutional and Operational Experience

The effectiveness of *mentorship* by more experienced fellow leaders or senior leaders appeared to be a credible means for positive development of personal confidence, trust, and decisiveness to use intuition in a professional domain. Whether a classroom experience in a military school or a recollection from an incident in field operations, participants shared both positive and negative experiences that encouraged or discouraged their willingness to trust personal intuition and a decision to act. The requirement for effective mentoring indicated the value of *role modeling* and dialogue between an expert and a learner.

One participant summarized his appreciation of experience and effective learning from an instructor-teacher or leader in the field:

Back to *experience*. If you don't experience it, you can't have an intuition about it. In a schoolhouse [institutional learning] environment–given the opportunity to fail in a safe environment–and they do a fairly good job–some staff groups do it better than others. Some instructors let them "go down the road." Unless you do the homework, so you can

see *why* it went wrong, as opposed to "Stop. That's not going to work." You're never going to learn that way. Otherwise, how do I know "that"?

Participant perspectives, similar to the Dreyfus research findings (1985), appeared during the participants' interviews. Although the words were not exactly the same as with the Drefus findings, the following terms indicated *cues* that led to intuitive recognition:

- Patterns.
- Similarity to previous experiences.
- Commonsense.
- Topic expertise.
- Critical point of attention.
- Taking time to evaluate if more time was available to decide.

General Gordon Sullivan, a former Chief of Staff of the U.S. Army, emphasized the fundamental requirement to *recognize patterns* and translate sensory data into information and knowledge. He stated that leaders in the 21st Century, "must see *patterns* [emphasis added] where others cannot and have the courage to *decide and act quickly*. In the fog that is the future, there are as yet indecipherable patterns….decisionmaking under great *ambiguity*….Leaders must take *decisive action*" (Sullivan & Harper, 1996, p. 220).

Similarity in experiences was useful, but they could be fallible too. The approach of taking more time was a luxury that was not available for participants in some situations. This indicated that *experience* was a very important aspect in their professional development, and provided a memory bank–explicit and *implicit*–from which to draw.

The concept of pattern recognition–explicit or *implicit*–surfaced often in how participants described their experiences in intuitive decisionmaking. Despite this theme emerging during the research, the term of *pattern recognition* was not articulated explicitly by participants even though Army doctrine describes pattern recognition as essential to intuitive decisionmaking.

Critical and Creative Thinking

Multi-perspectives of perception or understanding of intuitive decisionmaking were evident when interpreting all participant interview responses and dialogue. In comparing the comments of participants with the Army's learning concept for relevant training and education in

the next several years, the components of critical and creative thinking easily surfaced in the analysis. Multiple viewpoints suggested the requirement to discern or distinguish what occurred, what may have occurred, and *why* a particular intuition was a decision for action.

In one participant's reflecting on an incident, he recalled there had not been anything unusual in the recent past, but other areas had been "quite hot" [combat actions] with a lot of activity. He mentioned that experience and confidence in your own decisions were important. Nonetheless, he was not able to identify the "Why now?–Why then?" [the decision to act]. "You're never truly confident in your decision unless you have some degree of an idea of what is to come from the decision, whether it's conscious or unconscious–from your sub-conscious."

When intuitive actions were assessed critically and discussed openly among peers or senior leaders, participants expressed a positive outcome. When a situation resulted in other than candid and constructive analysis, participants indicated negative reinforcement to taking risk in the future. The negative reinforcement was often a harsh rebuke from a senior leader with no subsequent discussion of *how* to improve expectations and performance. Some senior leaders described by participants in this category "just didn't get *it*"−they were "toxic leaders." This implied an ineffective use by leaders of a well-proven Army technique of after action review (AAR) to identify causal conditions on decisions and behavior in order to sustain or improve.

A participant was quick and forthright in his understanding. He offered his thoughts on critical and creative analysis as follows:

> It relates to thinking. It's kind of the foundation for how detailed or not detailed that you're going to go into your thinking, into your planning, or building a common operational picture in your mind. Those that are more inquisitive are going to be your guys that are your divergent thinkers. There's something we need to pursue further. The less inquisitive are concrete thinkers, or "let's get to the answer and then move on."

Two additional aspects suggested by participants that affected effective intuitive decisionmaking were personal *overconfidence* or *ignorance*. In analyzing past actions, participants identified these two personal conditions as probable reasons for misunderstanding explicit or implicit cues. As a result, a pattern sometimes remained masked and situational awareness was limited in its intuitive perception. These personal acknowledgments by

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participants suggested that they must continually assess themselves, and acquire necessary analytical and perceptive skills for situational awareness.

Personal stress in a particular situation was a consideration of what a *fear* or *anxiety* may cause in making an intuitive decision. The normal range of emotions would concentrate on a real or perceived threat and marginalize how a full range of experience be considered. This "tunnel vision" was as if the participant was looking through a tube and attention was focused on a small peculiar aspect of an environment. Uunintended biases were a likely possibility.

Error can include lack of an appropriate code to relevant available information. The possibility of bias existed in judgments and further complicated uncertainty and best choices. Tversky and Kahneman (1974) identified issues of representativeness, availability, and anchoring from a known point as caution considerations. A representation that appeared similar to other events or instances might not have any common antecedents for cause and effect. The ease with which an occurrence can be recalled—availability—may be biased when the familiarity of recurring instances and an expectation of what is most likely can skew a decision. Tversky and Kahneman suggested these points are part of the fallibility in many otherwise "good" choices in lifelong experience learning.

In 2011, Kahneman warned about such cognitive illusions as follows:

Confidence is a feeling, which reflects the coherence of the information and the cognitive ease of processing it. It is wise to take admissions of uncertainty seriously, but declarations of high confidence mainly tell you that an individual has constructed a coherent story in his mind, not necessarily that the story is true ("Daniel Kahneman: How", 2011, para. 13).

A respected contemporary military thinker, Wass de Czege (2011), advanced the thought that choice is constantly affected by "many unknowable and uncontrollable factors" (p. 50). At the tactical level of decisionmaking, he posited that decisions "depend on the super-fast (in a blink) and deliberative (the speed of words) working of the human brain" (p. 53). Whether tactical, operational, or strategic in consequences, a decision requires periodic inquiry to what has changed, what is changing, and what is about to change in previous situational awareness. His questioning of *how* to make sense of dynamic, complex conditions signaled a conspicuous requirement to design an appropriate decisionmaking model to regularly challenge previous assumptions and factors of a particular circumstance for current and future relevance. This

learning and adapting in the *art* and science of decisionmaking should be ingrained into deep thought and discernment−the collective mental constructs learned from doctrine, extensive experience in the military profession and specific domains, and professional military education.

Professional Intermediate Level Education

The implication for participants at their current phase of professional military education− Intermediate Level Education (ILE)−was to further "expand their scope of responsibilities through educational experiences that foster advanced critical thinking, adaptability, agility, and problem solving skills" (*The U.S. Army Learning Concept*, 2011, p. 55). The education evaluated past experiences, provided new stressful and ambiguous situations, and mitigated knowledge and experiential gaps in their proficiency. The equivalence of this military institutional and operational experience would be at the master's degree level of knowledge and credentialed proficiency. Comments during participant interviews indicated that intuitive decisionmaking was not often discussed in classroom seminars or simulation exercises.

Kahneman (2011) cited a concise summary by Simon related to intuition and memory in its many forms. Simon (1968) stated: "The situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition" (Kahneman, 2011, p. 237). This statement was elegant.

Nonetheless, a sensational jeopardy loomed in the near future with no acknowledgement that the term *intuitive decisionmaking* exists. Kahneman (2011) indicated a similar concern on the importance of defining essential terms and concepts. He was adamant that, "Ultimately, a richer language is essential to the skill of constructive criticism. Much like medicine, the identification of judgment errors is a diagnostic task, which requires a precise vocabulary" (p. 418).

The U.S. Army required "higher-level cognitive skills along with acquiring knowledge of Army-level issues" for participants as they attended their Intermediate Level Education (ILE) (*Army Learning Concept*, 2011, p. 55). Notwithstanding, one comment from a participant on creative thinking was, "I think the Army discourages it. You have a finite time, so you don't have a lot of time to explore or creatively think of a solution." Although this participant considered himself more of an intuitive person, he commented that, "I think the Army values more the deliberate decisionmaking because more people kind of understand it." He did caveat this statement with support for intuitive decisionmaking depends to some extent on

organizational issues and organizational culture. He provided an example on the willingness or misgiving to take risk or be intuitive: "It's almost an "ebb and flow." When I feel that I'm in an organizational culture where it doesn't necessarily encourage risk-taking–that you "play it safe"–you'll do well."

One participant recalled his own early experiences in self-confidence and decisionmaking. He recognized the difference between intuition and a guess, and the possibility of making a wrong decision.

> I think maybe without thinking–sometimes–you just want to get the decision made without the intuitive piece, as a junior leader. And I know I did. "I got to make a decision. I don't know what the heck the answer is. I don't even have a "gut feeling" on it, but I need to have an answer."

> As an officer, typically in which as a lieutenant you "come in" [are commissioned as an officer] and the perceptions are you have to be able to make those decisions. You're the leader, and you have people tell you to rely on the platoon sergeant and stuff. I think we all go through some level of "still trying to jump" [be intuitive] and [instead] just make a rash decision, as opposed to an intuitive decision.

The impressions from participant responses indicated that critical and creative thinking education and praxis required iteration and quality feedback on learning. An example of earlier career training and education in Army schooling was the "Think Like a Commander" approach at the U.S. Armor School's Captain's Career Course (CCC) in 2005 and 2006 (Shadrick, S., Crabb, B., Lussier, J. & Burke, T., 2007). Time-constrained vignettes trained leaders to make adaptive decisions, often in rapidly changing situations. Results suggested that similar deliberate training and education strategies "can be applied to train other complex, cognitive tasks such as battlefield visualization" (p. 16). These types of training and education techniques could potentially raise the awareness of leaders using their tacit knowledge and intuitive decisionmaking skills. Current Army initiatives in 2012 of "leveraging technology without sacrificing standards" appeared to be an avenue for "credible, rigorous, and relevant training and education" (*Army Learning Concept*, 2011, p. i).

Critical Reflection and Creative Thought

Experiences shared by participants in this research ranged from early military episodes as second lieutenants in a garrison setting to crisis decisions in combat only several months in the past. Other vignettes described non-military intuitive decisions made as a parent in the medical emergency of a child, or an intuitive judgment during a major business contract negotiation. As participants reviewed their intuitive experience, they usually indicated a sense of *experience* related to *time* and longevity in a particular domain of *expertise* as important to their confidence in making an intuitive decision.

One participant pondered how he made a particular intuitive decision: "I don't remember any sensation. I don't remember any sensation like in your stomach, you know, or "hairs coming up on the back of my neck," or anything like that. It was just a decision that felt right [correct]".

Another participant acknowledged the importance of this type of *learning* [emphasis added] with the following comments:

It does play a lot into it, in fact, when you go back "in the loop" [the deployment cycle]. Those experiences "play back" [provide knowledge and insight] into your planning process, and those things as you start planning missions and things like that. I started to "get a feel" [appreciation] for the terrain and the "layout" [situational expectations and norms] in the tactics and stuff like that where "stuff" [attacks by the enemy] would be more likely to happen versus other areas.

Time was often considered a necessary condition–often great periods of time–to allow for recurring reflection and learning–perceiving–from past deliberate and intuitive decisions and resultant actions or inactions. The implication was intuition may be the result of learning that is retained as *tacit* knowledge until required in a particular circumstance.

A participant related intuition and pattern recognition this way:

It all starts with the cognitive, because you assimilate, and it all happens very quickly–at lightning-type speed. It's all the stimuli that you have, and as your brain searches through that, then you basically get to a point where, "OK, this is something that I've seen before–something that I've done before. A series of stimuli causes me to react in this way. And that's when you "feel it".

Another participant remembered his training experiences as an observer-controller (O/C) [training mentor]:

> I've been an OC, an observer-controller down at the JRTC [Joint Readiness Training Center], and I would actually know after we had our first meeting–you know, just replaying past experiences to see if I could think of any other examples. A fairly common one, now that I think about it, is a theme during after action reviews. Probed from my peer commanders, "*Why* did you make that decision?"
>
> [The response was often,] "I don't know. It just felt right." And sometimes it worked, and sometimes it didn't. Now that I think about it, there was quite a bit of intuitive decisionmaking going on whether it was acknowledged or not.

Participants commented that *learning* from experiences suggested the need for informal and formal means of *feedback*–assessment and evaluation–on intuitive decisionmaking in order to improve performance. The U. S. Army provides excellent means to improve experiential assessment and self-development in praxis. Two of these means are (1) *A Leader's Guide to After-Action Review* (1993), and (2) the Army's *Self-Development Handbook* (2007). These two resources provide a definitive way to use formal and informal group assessment of success and failure; and a self-developmental guide to identify personal strengths and weaknesses; analyze and construct learning opportunities; and chart a program for lifelong learning. These two guides are descriptive in how to assess and evaluate performance in known circumstances, probable situations during professional career opportunities, and personal self-development.

Reflection on past personal actions or vicarious appreciation of intuitive incidents was stated in the research as beneficial to improved performance in subsequent similar circumstances. *Uncertainty* was acknowledged as a norm in many conditions. On other occasions cited by participants, they stated that they "just knew" what to do. In any case, dedicated assessment and evaluation of intuition and action based on an intuition appeared integral to professional development of a military leader.

Confidence in a Complex World

"Leadership is a *lifelong learning* process for Army leaders, but action is its essence" (*The Army*, 2005, p.1-19). Adult learning for this qualitative research "provide[d] an opportunity

to gain confidence in one's own judgment, but also a degree of humility as well" (Barnes, Christensen & Hansen, 1994, p. 41). The researcher applied *critical reflection* (Brookfield, 1987, 1990, 1995) to promote personal understanding by challenging personal assumptions and assessing an issue from multiple perspectives. A *synthesis* seemed to occur often for participants as they heard themselves talk about their thoughts. For the researcher, a degree of detachment was necessary to assess "how it is they [participants] come to know; an awareness of the reasoning, assumptions, evidence, and justifications that underlie that something is *true*" (Brookfield, 1995, para. 11).

When asked about the intuitive aspects he experienced versus deliberate decisionmaking, one participant was candid on his *trust* of intuitive indicators in contrast to scientific and "hard" analysis. There appeared to be no sure solution in such a dilemma. He stated:

We sometimes get it wrong. But it's going off that almost "gut feeling" that I "know" there's going to be a suicide bomber coming from this area at this time. Seasonally, it's about right, but while the other indicators are saying, There's a bomber up here. OK. There was something not right about the conditions, but I can't give you the "traffic" [indications] that say, 'But I 'm telling you that it's going to happen here. Instead you've got to trust me on this, boss.' It goes back to that pool of experiences, that pool of understanding of the environment that may contradict the hard facts you have available to me…But your "gut" thinks it's going to happen here.

These aspects of adult learning set a charter and practical way to explore a topic such as intuitive decisionmaking that by nature is implicit. Complementary to a semi-detached perspective of observing and recording from an external vantage point were listening actively, and "being with" the participant as they recounted a particular intuitive experience and decision. This capability obtained a valuable subjective appreciation of the phenomenon.

Talking about intuitive experiences appeared to be constructive for participants in this study. From the researcher's perspective, they were combining verbal descriptions to recalled imagery of an incident; clustering bits of information that emerged as they spoke, and attempting to make sense of *what* occurred and *why* they made the decisions they did. One participant described similar indicators or clues that he looked for when dealing with military and civilian representatives on military contracts. He said:

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It's the combination of a lot of things…When you start showing that you have some kind of intelligence or knowledge about what they're doing, they start acting uncommon and unreasonable…You get the blank face; you get the lack of some emotion…OK, something's 'fishy.' Something's not there. We're going to have to try and 'dig in' and do a recount [of contract cost factors and estimates].

Participants seemed to be saying more than "you just know." They seemed to be conveying the *how* of knowing what to do. Somehow, they appeared to have learned from experiences, explicit and implicit, and were able to adapt instantly when particular circumstances −conditions−arose. Whether cues were a strange piece of debris on a roadside, an odd sensation while piloting a helicopter along a regular air route, or a "gut feeling" when looking at an ill son or daughter, tacit knowledge was acknowledged as part of an intuitive decision. *Tacit* knowledge appeared to be integral to the sense-making and intuitive decision process.

Implications

Implications of this research emerged from a small purposeful sample of ten volunteer who were commissioned officers in the U.S. Armed Forces: eight U.S. Army officers, one U.S. Navy officer, and one U.S. Air Force officer. No generalization can be expected from such a small sample, but the study indicated the opinions and beliefs of these officers in 2011 as participants in a qualitative study on intuitive decisionmaking. Implications of this study addressed the six themes identified in the research of pattern recognition; values and ethics; Army doctrine; professional learning; personal expertise; and, self-efficacy.

Pattern Recognition

Participants indicated that pattern recognition was particularly important in the ability to make an intuitive decision. They also commented that being able to describe *what* or *how* an intuitive decision occurred may be beyond their personal ability to explicitly explain. Intuitive decisionmaking, in some cases, appeared to remain an enigma and in some cases might be described as an action that cues from *implicit* knowledge. The implication suggested that a realm of *tacit* knowledge existed, and was probably activated by *cues* in a specific environment that sometimes resists being identified and described.

Values and Ethics

Participants expressed a firm conviction in the professional ethics of the U.S. Armed Forces that shape many of the intuitive decisions that they could recall. Ethics appeared to be an underpinning of their military leader responsibilities and authority in service to the Nation. Participants believed that their decisionmaking was grounded in ethical conduct and a moral code of U.S. culture, and as articulated in their Federal commission and appointment as an officer in the U.S. Armed Forces. Each participant was confident that they could make effective intuitive decisions that would not violate those ethical and moral bases. The implication indicated that professional values and ethics were a fundamental and personal ideal that supports making a "decision to decide" instantaneously. In the opinion of participants, they were expected to demonstrate an embedded U.S. Armed Forces professional ethic and cultural moral code.

Army Doctrine

The interview descriptions of intuitive decisionmaking by participants indicated that they could not effectively explain intuition and the decisionmaking that intuition affects. The implication spotlighted a glaring issue that Army doctrine no longer has an approved term of *intuitive decisionmaking*, and that the concept of intuitive decisionmaking is, therefore, not properly integrated into the Army's decisionmaking process. The lack of an integrated concept of intuitive and analytic decisionmaking widened a significant gap in the Army leader development model. This doctrinal gap suggested that Army leaders may not be as effectively prepared to act effectively in moments of complex crisis which require intuitive decisionmaking.

Professional Learning

Participants openly shared their professional learning experiences in educational settings such as a classroom and practical settings in a field training environment or deployed in a combat area. They recalled the learning that occurred in terms of *training* in realistic military conditions and *professional military education* in institutional programs. Multi-perspectives of perception or understanding of intuitive decisionmaking were evident in the dialogue of participants. Components of critical and creative thinking readily surfaced in their comments.

Mentorship was noted as excellent facilitation to learning. However, when leaders were abusive or critical without constructive assessments in the learning process, some participants

remembered being very hesitant to share their experiences or to act on an intuition. Learning had other potential pitfalls. Participants were sometimes concerned with being overconfident. The contrast of overconfidence was being ignorant of cues or other conditions that could affect an intuitive decision. The implication for professional learning was that productive learning occurred in educational and field environments when the doctrine is clearly understood, leadership conditions encouraged initiative and prudent risktaking, and formal and informal feedback systems assessed the effectiveness intuitive decisions occurred.

Reflecting on vignettes uncovered during the literature review of other professions such as firefighters and their incident-site supervisors, or intensive medical care providers and doctors, the implications of this research for further exploration were profound. Intuitive decisionmaking appeared to be more than relevant in many non-military professions. Case studies in other than the U.S. Armed Forces indicated that intuitive decisionmaking is an essential component of professional decisionmaking in crisis situations when immediate decisions are required.

Personal Expertise

Participants used personal or vicarious experiences to illustrate their recollection of expertise and situations of intuitive decisionmaking. Expertise appeared to result from multiple experiences and reflection on the conditions existing at varied particular points in time. Confidence improved through critical reflection on past performance, and usually was acquired over a number of years. Some participants were able to learn when recognizing the difference between intuition, a guess, and the possibility of making a wrong decision. Participants recognized the learning value of reflection-*on*-action, that is, an after action review of *what* occurred and why it probably occurred the way it did. The concept of reflection-*in*-action, that is the *thinking* that occurs *as* a decision is made, was less articulate in their recollections. The implication was a requirement to better perceive and understand *how* and *why* a decision was made. All participants acknowledged that *expertise* is developed over a long period of time. This purposeful sample appeared to align with contemporary literature that suggests expertise takes about ten years or more of preparation, practice, and feedback.

Self-efficacy

Participants had varied ideas on self-efficacy, but all seemed to agree with the statement offered during one interview: "I think since I'm older, I started to pay a little more attention to the cues." Participants expressed their distinct belief in their capability to organize and execute an action that sometimes required intuitive decisionmaking. They were also candid in admitting that there were occasions in their area of expertise when they could not explicitly identify why they made a particular intuitive decision. And yet, when successful in an intuitive decision, the implication was that a situation with regular iteration and similar *conditions,* conducted and assessed with timely rapid and accurate feedback on action outcome, can improve self-efficacy and skill sets for a particular domain of expertise.

Near-term Recommendations

Definition of Intuitive Decisionmaking

- Determine a revised definition of *intuitive decisionmaking* as an Army doctrinal term. When the term *intuitive decisionmaking* was rescinded in the September 2011 edition of Field Manual (FM) 6-0, a serious gap was created in Army decisionmaking and leadership doctrine.

The definition published previously by the U.S. Army in FM 6-0 (2003) was as follows: "Intuitive decisionmaking is reaching a conclusion through pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character" (p. 2-4). The 2011 edition of FM 6-0 has the same description at p. 3-3; however the same field manual rescinded the term of intuitive decisionmaking.

Based on the findings and interpretation of this research project, aspects that should be considered in a revised definition of intuitive decisionmaking were as follows:

- Tacit knowledge.
- Domain expertise.
- Values, ethics, and culture.
- Time sensitivity.
- Pattern recognition.
- Self-efficacy.
- Prudent risktaking.

- Decisive action.

Tacit knowledge and recognition of implicit cues in an environment was influenced by expertise in a specific domain; embedded values and ethics of a culture or profession; and self-efficacy. This type of decisionmaking was often experienced in a moment of crisis and risk as an instantaneous or nearly instantaneous decision without fully understanding the causal conditions.

The word *conclusion* sets a misleading expectation in the former Army definition when this word is commonly understood to be a reasoned judgment. Intuition is not a reasoned event. *Tacit knowledge* conveys an *implicit* awareness and characteristic to the phenomenon. Apprehension complements the sensing, but inability to fully explain. The *contextual* environment at a particular decisionmaking moment is focused implicit awareness—the *knowing* is immediate. Nonetheless, an intuitive decision is acknowledged to be far from a guaranteed successful solution. And yet, the expert in his or her domain of *expertise* recognizes risk, possibility and probability, and *acts* on a compelling notion of intuitively *knowing* what to do or not do. Defining *intuitive decisionmaking* in U.S. Army doctrine could consider a definitional framework as follows:

Figure 5.1 Recommended Definition of Intuitive Decisionmaking

> **Intuitive Decisionmaking**
> **Intuitive decisionmaking is an action prompted by tacit knowledge**
> **that apprehends implicit cues within a particular situational context and**
> **instantly visualizes cause-effect conditions and probable outcomes.**
> **Recommendation JHM**

Army Field Manual 6-0, *Mission Command* is being updated during 2012 with an expected publication date of the revision in October 2012. The requirement to accurately reestablish and define *intuitive decisionmaking* as an official Army term is a near-term recommendation. This recommendation is to be provided to the Combined Arms Doctrine Directorate (CADD) of the U.S. Army Combined Arms Center (CAC). The CADD is the responsible organization for authoring and coordinating this Army doctrine. The CADD also integrates doctrine to ensure consistency of terms, symbols, fundamental principles in all Army doctrine. Once approved as an official Army term, publication of the term would be placed in the Army's proponent document, Army Field Manual 6-0, *Mission Command* (2012).

U. S. Army Doctrine on Intuitive decisionmaking

- Refine a doctrinal description of intuitive decisionmaking in the U.S. Army's *art of command* that acknowledges tacit knowledge and the personal confidence to act on intuition when time requires immediate decision and action−decisive action. The current doctrinal description does not adequately integrate the use of intuition with analytic decisionmaking processes.

The 2011 edition of FM 6-0 discussed several critical components that impact on intuition and intuitive decisionmaking. However, the doctrinal discussion leaned heavily toward the deliberate steps of a concept model that the Army calls the rapid synchronization and decisionmaking process (RSDP). This was *not* intuitive decisionmaking. The RSDP was an abbreviated form of deliberate decisionmaking

- Refine a doctrinal description of intuitive decisionmaking in the U.S. Army's *Commander and Staff Officer Guide*. This doctrinal reference is currently Army Tactics, Techniques, and Procedures (ATTP) 5-0.1 (2011).

The 2011 version of ATTP 5-0.1 is undergoing an integration of tactics and techniques for mission command to a new FM 6-0, *Mission Command*, planned for publication in October 2012 (*Doctrine Update 1-12*, 2011, p. 6). This new field manual could acknowledge tacit knowledge and the personal confidence to act on intuition when time requires immediate decision and action. Experience in a specific domain and expertise in pattern recognition appear to remain significant aspects of implicit awareness to explicit conduct. The current doctrinal description does not adequately integrate the use of intuition with analytic decisionmaking processes.

If an official definition of intuitive decisionmaking is reestablished, the U.S. Army could describe the synthesis of theory, education, and practice for intuition and intuitive decisionmaking skills. This acknowledgement of *intuition* in military decisionmaking is critical to the *decisive action* required of Army leaders in contemporary operational environments.

This recommendation is to be provided also to the Combined Arms Doctrine Directorate (CADD) of the U.S. Army Combined Arms Center (CAC). The requirement exists to accurately describe the use of intuitive decisionmaking in the Army's doctrine on leadership and mission command. This near-term recommendation could to be credentialed as doctrine in 2012.

Recommendations for Future Research and Actions

Adult education is a continuum. This process for learning and applying knowledge retained a subjective and responsible recognition that knowledge cannot be completely an explicit endeavor.

A domain of implicit knowledge will always remain "on the edge" of what is known practically in our day-to-day living. Otherwise, we could not be tantalized with the idea of *discovery* and compelled to pursue an answer to something vague as in a disorienting dilemma (Mezirow, 1991). Critical reflection and continued research may illuminate a more succinct and easily understood value of intuition in military decisionmaking.

The very meaning of the term "*re*search" indicates a quest to continue a search, to further examine, and to explore. This exploration of intuition may find a lucrative channel of purpose in the words of Goldberg (2005) as "actor-centered knowledge" (pp. 157-158). Recommendations for future adult education exploration on the phenomenon of intuitive decisionmaking are as follows:

Inform Professional Military Education

Intuitive decisionmaking was not commonly described in perception or understanding by midcareer U. S. Armed Forces officers. Terms that describe intuitive decisionmaking in U.S. Army doctrine, such as pattern recognition, were not used often by U.S. Army officers in the focus group.

- The U. S. Army could use the Mission Command Center of Excellence (MCCoE) to collect and analyze lessons learned on operational and institutional examples of intuitive decisionmaking in the U. S. Army.

- The Center for Army Lessons Learned (CALL) could transfer those lessons learned to the Army's Combined Arms Center-Training (CAC-T) and Combined Arms Center-Leader Development and Education (CAC-LD&E). CALL could quickly transfer knowledge Army-wide through the production of handbooks, newsletters, and on-line professional forums. The MCCoE could integrate these lessons learned into Army doctrine through its Center for Army Doctrine Development (CADD). These organizations could improve Army leader and Soldier perception and understanding of intuitive decisionmaking in Army operations.

- The U. S. Army could task the Center for Army leadership (CAL) to conduct research and studies on intuitive decisionmaking doctrine. In its role as the principle proponent of Army leadership and *leader* development, CAL is responsible for the Army Leader Development Strategy and manages the Army Leader Development Program.
- The U. S. Army could task the U. S. Army Command and General Staff College (USACGSC), as lead agent for the Army's *leader development program*, to explore intuitive decisionmaking by contemporary military leaders in its professional education programs. The CGSC advances the *art* and science of the profession of arms in support of Army operational requirements. CGSC coordinates closely with the CAL in leader development. Leader development programs at USACGSC include:
  - Command and General Staff School (CGSS).
  - School of Advanced Military Studies (SAMS).
  - School for Command preparation (SCP).
  - School of Advanced Leadership and Tactics (SALT).
- The U. S. Army could use the Army's Combat Studies Institute (CSI) to research and publish original interpretive works on intuitive decisionmaking via the CSI Press on issues relevant to the Army and leader development. Interviewing Army leaders on their operational experiences with a focus on *intuitive decisionmaking* could yield important insights on leadership challenges and lessons learned on intuitive decisionmaking in *contemporary* and *historical* military operations.
- The U. S. Army could use the Center for the Army's Profession and Ethic (CAPE) as a means to assess, study, and refine the profession of arms, the Army Ethic, and Army culture. This action could increase Army members' understanding and internalizing what it means for the Army to be a *profession of arms;* to be a professional; and to accelerate professional and character development in individuals, units through training, education, and leader development with consideration of intuitive decisionmaking.
- The U. S. Army could use the Army Management Staff College (AMSC) to educate the Army Civilian Corps [Department of the Army Civilians (DAC), that is, U.S. Government employees of the U.S. Army] and designated military members with an appreciation of intuitive decisionmaking in *leadership* and *management* responsibilities.

AMSC acts as the analytical agent for the Army Civilian Education System curriculum, and conducts research and provides on leadership and management solutions to the Civilian Corps and installation management communities of the U.S. Army.

These recommendations are to be provided to the colleges, schools, centers, and institute listed in this section. The parent organization for these organizations is the U.S. Army Combined Arms Center (CAC) at Fort Leavenworth, Kansas. The CAPE affiliation is at the United States Military Academy (USMA) at West Point, New York.

Conduct Recurring Studies by the Army Research Institute (ARI.)

Qualitative, quantitative, and mixed method research could study the contemporary 2012-2015 appreciation of *intuition* in decisionmaking. The mission of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize individual and unit performance and readiness to meet the full range of Army operations through advances in the behavioral and social sciences. ARI is the Army's lead research laboratory for training, leader development, and personnel research (*About ARI*, 2011a, 2011b). ARI conducts Army-wide attitude and opinion surveys and occupational analysis. Topics to focus research could be as follows:

- What relationship does a U.S. Army officer identify among *conditions–physiological and psychological–*that exist at a specific location and time when making an intuitive decision?

- What *cues* prompt a U.S. Army officer to an intuitive decision in a particular situational context?

- What *personal biases* does a U.S. Army officer acknowledge in assessing a personal intuition and the decision to act?

- What techniques of reflection-*on*-action does a U.S. Army officer believe most beneficial in order to explore personal or vicarious intuitive decisions?

- What aspects of *self-efficacy* does a U.S. Army officer demonstrate in intuitive decisionmaking?

Qualitative research could continue further exploration in the 2012-2015 period on the research questions of this research project. The issue of perception and a clear understanding of personal intuition as a military leader remains an open issue for inquiry.

- What is a participant's *perception* on the phenomenon of intuitive decisionmaking?
- What value does a U.S. Army officer place on personal and vicarious e*xperiences* as a precursor to intuition and intuitive decisionmaking?

Other qualitative research on intuitive decisionmaking *learning* and *adapting* with U.S. Army officer participants could explore the issue with the following groups of leaders:

- Female officers. Although one female officer participated in the focus group, and one of the two pilot interview participants was with a female officer, the 10 volunteers for the purposeful sample were all male officers.

- Second lieutenants, first lieutenants, and captains. This group of officers is junior to the majors and lieutenant colonels in military rank and normally have less military experience.

- Majors and lieutenant colonels in the CGSC Intermediate Level Education (ILE) course in 2013 and 2015. Conducting a recurring exploration of officers during this professional military education phase may provide an opportunity for quality reflection and meaning-making that might not otherwise emerge if in a high-tempo institutional duty assignment or deployed on an operational mission.

- Battalion and brigade commanders. These leaders have been selected to command based on performance evaluations as some of the best officers in their respective officer cohorts. Their perception of intuitive decisionmaking in personal and vicarious experiences can ostensibly be articulated with an advanced situational awareness and understanding of intuitive expertise. Successful brigade commanders will be the cohort from which general officers are selected and promoted.

- General officers. These leaders are the senior military leaders of the Army. Their perception of intuitive decisionmaking in personal and vicarious experiences should be the assimilation of two to three decades of experience and demonstrated expertise. Their leadership and guidance will command and direct *how* the Army defines, describes, and effectively uses intuitive decisionmaking.

Topics in each of these cohorts could include the effects of cultural values, professional ethics, and personal judgment skills as they relate to intuitive decisionmaking in crisis circumstances. Articulating situational awareness and self-efficacy of making intuitive decisions

in crisis may be more evident at the tactical level of events. However, the more senior leaders may have an attuned ability of describe and define what intuitive decisionmaking is and has been as these officers progressed through many forms of training, professional education, and operational experiences.

Army research could attend to what has changed in the real-world of Army leaders since the last group of Army Research Institute (ARI) studies related to intuition and adaptability in the last several years. At a minimum, these studies could assess officers who had experienced being a military leader in a prolonged state of war [over 10 consecutive years] and other forms of persistent conflict.

The current Chief of the Staff of the U.S. Army, General Raymond Odierno, recognized the ongoing daily challenge for Army leaders as the Army remains "the force of decisive action for the nation" (Odierno, 2011). The challenge projected into 2012: "While we cannot predict the future in *today's uncertain and complex strategic environment*, we can be certain that our Nation will continue to call on America's Army" (Odierno, 2011).

Conduct Longitudinal Studies with Research Participants

- Conduct qualitative longitudinal studies with selected research participants of this 2011 research project. Research findings will not be applicable for any generalization.

Prior to the ten participants departing the field site in 2011 for their next official military duties, the researcher coordinated with two of the participants for a subsequent research contact. This contact will be initially an informal dialogue between June 2012 and December 2012. Discussion will reflect on their research project experiences in 2011, and determine if a follow-on questionnaire on intuitive decisionmaking experience in the 2012-2015 period is appropriate. If agreed upon mutually as worthwhile, additional contact between these participants and the researcher will query their experience and perceptions as of December 2012 and December 2014. Participant impressions will be collected and explored in accordance with the ethical protocols used in this research project.

Present Qualitative Research at Adult Education Forums

- Present qualitative findings and recommendations of this research at adult education forums. Venues include the American Association for Adult and Continuing Education (AAACE), and Adult Education Research Conference (AERC).

Aspects of the Kansas State University doctoral program cohort and preliminary research on the topic of intuitive decisionmaking have been presented by the researcher at the annual worldwide conference of the American Association for Adult and Continuing Education (AAACE) for the last three consecutive years. The approved dissertation and qualitative research of U.S. Army officer intuitive decisionmaking will be proposed for presentation at the 2012 AAACE conference. A follow-on opportunity may exist to propose and present at the 2013 Adult Education Research Conference (AERC) if this support assists any doctoral student conducting subsequent research on intuitive decisionmaking by U.S. Armed Forces officers.

Publish Qualitative Research in Adult Education Periodicals

- Submit an article in 2012 to *Adult Learning.* This practitioner-oriented journal published by the American Association for Adult and Continuing Education.

The review of the researcher's research will focus practice issues and opportunities in the Intermediate Level Education (ILE) course at the U.S. Army Command and General Staff College or the Army Management Staff College (AMSC) at Fort Leavenworth, Kansas with a problem-solving emphasis. A primary audience for *Adult Learning* includes all individuals who design, manage, teach, conduct, and evaluate programs of adult and continuing education.

- Submit an article in 2012 to *Adult Education Quarterly* (*AEQ*). This publication is a quarterly scholarly refereed journal committed to advancing the understanding and practice of adult and continuing education.

AEQ aims to stimulate a problem-oriented, critical approach to research and practice, with an increasing emphasis on interdisciplinary and international perspectives. The focused perspective of this article will be the opportunity to propose research with international officers of foreign nations that attend the Intermediate Level Education (ILE) course at the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas.

Publish Qualitative Research in Military Practitioner Periodicals

- Submit an article in 2012 to *Military Psychology.* This publication is the journal of the Society for Military Psychology of the American Psychological Association (APA).

The journal seeks to facilitate the scientific development of military psychology by encouraging communication between researchers and practitioners. The journal publishes behavioral science research articles having military applications in the areas of (1) manpower and personnel issues; (2) testing and measurement; (3) training and human factors; (4) clinical and health psychology; as well as (5) social and organizational psychology. *Military Psychology* is international in scope.

- Submit an article in 2012 to *Military Review*. This is a refereed journal of the U.S. Army's Combined Arms Center at Fort Leavenworth, Kansas.

The bi-monthly publication provides a forum for original research and debate on the *art* and science at the tactical and operational levels of land warfare, and other issues of interest to the U.S. Army and Department of Defense. *Military Review* also supports the education, training, doctrine development, and integration missions of the U.S. Combined Arms Center.

Conclusion

After a lifetime of professional study, research, and reflection, Polanyi (1958) stated his fundamental belief in the "undefinable powers of thought" (p. ix). He declared a distinct difference between *tacit* and explicit knowledge. Polanyi stated this distinction as, "Tacit knowing is more fundamental than explicit knowing: We can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell" (p. x).

Polanyi's supposition illustrated a contextual richness that emerged from his theory of personal [tacit] knowledge. He claimed that "we keep modifying, subsidiarily, our interpretation of sensory *clues* [emphasis added] by striving for clear and coherent perceptions, or enlarging our skill without focally knowing how by practicing them in ever new situations" (p. 112).

Thus, a quest to understand intuition and the decisions that can result appeared to require the following:

- Intrapersonal assessment of what "we *can* [emphasis added] tell" through explicit intellectual focus and dialogue on intuitive experiences (Polanyi, 1958).

- Practical analysis of *conditions* [emphasis added] in situational praxis that consider a *whole* as a composite entity, its individual components, and the contextual or meaningful configurations within which a *whole* exists (Wertheimer, 1945).

- Rigorous self reflection-*on*-action to behold cues that trigger an intuition a la reflection-*in*-action [intuitive meaning-making while doing] (Schön, 1987).

These perspectives, combined with passionate aspiration to discern perception into understanding, enhanced personal and professional self-efficacy in making intuitive decisions (Bandura, 1997). When reviewed by an interested and informed audience, findings and recommendations of this research indicated an *authentic* naturalistic rigor that can be accepted as trustworthy.

This qualitative research added to the professional body of knowledge, adult education concepts, and U.S. Army doctrinal literature on intuition and making decisions. The research recommendations posed open-ended avenues for exploration, and improved verifiability of adult education strategies on the phenomenon of intuitive decisionmaking.

Perceiving or understanding how an individual uses intuition to make decisions in crisis was an active and ongoing exploration that affects a much wider audience than the U.S. Armed Forces. Intuition and the willingness to act on intuition affect all professional disciplines–military and civilian–and the *people* who make those decisions.

Individual personal learning required critical and creative reflection based on personal or vicarious experiences, feedback from experts, and critical examination of recurring performances and outcomes. Intuition, as perceived by an individual, appeared to be channeled by self-efficacy and trust in personal *competence* to make effective intuitive decisions.

Whether philosophical, scientific, or educational in endeavor, one aspect of intuition appeared universal: a form of knowledge appeared to exist beyond the realm of absolute empirical proof. Rather than distinctly separate from explicit knowing, this implicit form of knowing suggested an integral relationship with deliberate thinking. Real-world knowledge, practical reasoning, and deliberate decision seemed to sometimes have a foundation on less than absolute truth. Intuition was indicative of such a sub-surface underpinning on making decisions.

The exploration of *what* intermediate U.S. Armed Forces officers during this research, in the rank of major or lieutenant colonel, perceived or understood as the nature of intuitive decisionmaking was a crucial perspective of leader development in their contemporary military

service. The study suggested that intuitive decisionmaking required a professional awareness and use comparable to the understanding and effective application of deliberate [analytic] military decisionmaking in time-constrained conditions.

The United States of America is currently at war and has been at war for over ten consecutive years. The cohort of midcareer officers in the U.S. Armed Forces that the participants of this research belong to are the source for the future colonels and generals–the senior leaders and military decisionmakers–in the future one to two decades of the 21st century.

Persistent conflict is the expected norm for our U.S. Armed Forces in the coming decades. Dangerous uncertain and complex conditions requiring immediate decisions will continue to appear in military missions for the foreseeable future. This real-world of midcareer military leaders spotlighted the practical mandate for improved self-efficacy–*confident expertise*–to trust their personal intuition in professional decisions. U.S. Army doctrine advocates critical and creative thinking for adaptive problem solving, and promotes expertise using a combination of implicit [intuitive] and explicit [analytical] decisionmaking.

U.S. Army leaders must nurture their intutive decsionmaking, be able to *define* and *describe* the use of intution as a form of productive thinking (Wertheimer, 1945), and discern that *tacit* knowledge enhances their effective day-to-day living and decisionmaking in an ever-changing complex and uncertain world (Polanyi, 1958). Decades after Polanyi posed his theory of personal knowledge, Kahneman (2001) stated his own conviction that *intuition* exists. The wonderful capacity for intution is within each individual, and "the mystery of *knowing without knowing* is not a distinctive feature of intution; it is the *norm* [emphasis added] of mental life" (p. 237). In conclusion, we may readily embrace Polanyi's premise that "we can know more than we can tell." (Polanyi, 1964, p. x).

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Appendix A - Memorandum of Introduction

Invitation to Participate in Research

SAMPLE

FOR: Participant Prospect in Qualitative Doctoral Research with U.S. Army Majors at CGSC

SUBJECT: INTUITIVE DECISIONMAKING: TACIT KNOWING IN ACTION BY
U.S. ARMED FORCES OFFICERS IN 2011

I invite you to participate in a qualitative doctoral research study on the perception and understanding of intuitive decisionmaking by U.S. Army Forces officers in 2011. Your participation will involve a semi-structured oral interview with me of about one hour in duration. You will have the opportunity to review your narrative transcript for accuracy and interpretation.

All information will be protected as confidential and agreed upon between you and me in an informed consent and confidentiality statement, as attached to this invitation.

The purpose and procedures of my doctoral research are explained in the attached document. If you decide to participate, you may withdraw at any time without explanation.

Benefits we can reasonably expect from colloboration are improved awareness and understanding of intuitive decisonmaking in Army doctrine and operational practice. Other reasonable expectations include contributing to professional knowledge and literature on the science and art of intuitive decisionmaking, promoting an appreciation of explicit and implicit knowledge in day-to-day living, and encouraging self-efficacy in your role as a U.S. Armed Forces leader in a complex and uncertain contemporary environment.

I will conduct this research interview process in the summer to winter 2011 timeframe. I look forward to exploring your and my insights on this critical issue of improved intuitive decisionmaking.

Encl (Informed Consent)   Sincerely,

                                           JON H. MOILANEN

Appendix B - KSU Informed Consent and Confidentiality

Informed Consent and Confidentiality Memorandum

SAMPLE

PROJECT TITLE: INTUITIVE DECISIONMAKING: TACIT KNOWING IN ACTION BY U.S. ARMED FORCES OFFICERS IN 2011.

DOCTORAL CANDIDATE RESEARCHER: Mr. Jon H. Moilanen. The doctoral committee chairperson of Mr. Moilanen's dissertation research committee is **Dr. Jane Fishback**.

PURPOSE OF THE RESEARCH: The purpose of this qualitative study, as a post-graduate research project for a Doctor of Education (Ed.D) degree, is to explore the nature of intuitive decisionmaking as perceived by mid career U.S. Armed Forces offciers in 2011. This research seeks to discern how a purposeful sampling of U.S. Army majors understand and use intuitive decisionmaking within the complex and uncertain environment of contemporary military missions and their own lifelong learning.

DURATION OF STUDY: The primary duration of participation is approximately one hour in a semi-structured interview. The researcher expects to conclude dissertation research by December 2011.

Interview data will be collected and interpreted by the researcher with a qualitative methodology. You, as a particpant, will review your personal interview data and researcher assessment in order to clarify or confirm the accuracy of the interview transcription. Your comments will be considered by the researcher in the study findings. Several expert peers of the researcher will review redacted interview data that removes any identity to a participant. This researcher peer review will indicate the credibility and trustworthiness of the researcher's qualitative assessment.

PROCEDURES TO BE USED: This qualitative study will explore intutive decisionmaking through the narratives of a focus group comprising five participants, a pilot study comprising two participants, and a purposeful sampling of ten participants. These lived or vicarious experiences and reflections will be collected by the researcher using a semi-structured oral interview protocol.

Interviews of about one hour in duration will be conducted in a private one-on-one environment. An interview protocol will allow flexibility to explore items of interest voiced by a participant while attending to the researcher's interview collection plan. The researcher will ask

supplemental questions to clarify participant responses. Any interview questions that make you, as a participant, feel uncomfortable may remain unanswered.

The significance of this research will be insights from participants which may potentially inform the organizational doctrine on how to better train and educate the concept of intuitive decisionmaking in the orgnaization's leader development programs. An improved descriptive basis of how intuition occurs may lead to more effective use of tacit awareness as an interactive component of apprehension to comprehension for immediate decisionmaking.

REASONABLY FORESEEABLE BENEFITS: Reasonably foreseeable benefits for research participants, KSU as a university, and the U.S. Army are an improved awareness and understanding of intuitive decisonmaking. Other reasonable expectations are as follow: (1) contribute to the body of knowledge and professional literature on the science and art of intuitive decisionmaking, (2) promote an appreciation of explicit and implicit knowledge in day-to-day living, and (3) encourage particpant self-efficacy in their role of U.S. Army leadership and decsionmaking in a complex and uncertain contemporary environment.

CONFIDENTIALITY: To protect the confidentiality of research participants and data, several processes will be used during and after the study. The researcher and each participant will sign confidentiality agreement. Each participant interview will be conducted on an individual and private basis. The researcher will use a pseudonym to identify each participant and demographic information in research documentation.

The following individuals involved in the research will sign a confidentiality agreement on any research documentation: (1) researcher, (2) each participant, (3) a transcriptionist for audio recordings to narrative texts, and (4) peer reviewers of individual participant interviews.

This research will be conducted in compliance with all Kansas State University (KSU) Institutional Review Board (IRB) policies stated in *IRB (Human Subjects)* research and U.S. Army Command and General Staff College safeguards for research with human subjects in CGSC Bulletin No. 40, *Research within the Command and General Staff College (CGSC)* (2010). No compensation is available for participation in this research. No is required for a semi-structured oral interview. No foreseeable personal risks, medical treatment or discomforts expected from the study.

At the completion of the research, all documentation of the research and dissertation report will be transferred to a CD-ROM and maintained by the researcher as a historical matter of record in a bank safe deposit box. Data from this research will be the property of the researcher and may be published in a professional venue such as an article or book, or presented in a forum such as an adult education or other professional conference.

POINTS OF CONTACT: For answers to questions about the research, the following people are available:

Jon H. **Moilanen**. Researcher. Work: [redacted]. Email: [redacted] or [redacted].

S. Jane **Fishback**. Research Committee Chairperson. Work: [redacted].   Email: [redacted].

[redacted]. Quality Assurance Office, CGSC. Work: [redacted].   Email: [redacted].

[redacted]. Chair, Committee on Research Involving Human Subjects, KSU Institutional Review Board (IRB). 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506 Work: [redacted].   Email: [redacted].

[redacted]. Associate Vice Provost for Research Compliance and University
 Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, Work: [redacted].   Email: [redacted].

Participation Agreement

As part of this informed consent agreement, I understand this project is research and that my participation is completely VOLUNTARY. I may withdraw my consent at any time and stop participating at any time without explanation and without any penalty.

I will be given a copy of the signed and dated document for my personal records. The original signature copy of this consent form will be retained by the researcher (Jon H. Moilanen) in the completed research record for at least three years from the date of the researcher's post-graduate graduation.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described.

Date:_____

Participant Signature: _____

Participant Name: (Print)   _____

Researcher-Witness Signature: _____

Researcher Name: **Jon H. Moilanen**

Note. Fill in demographic information on following pages and give to researcher. JHM

Participant Demographic Information

Date:_____

(*Note*. You may leave blank any information that you would not like to submit.)

Name:_____ Rank:_____

Pseudonym:_____(*Note*. Researcher will assign for participant anonymity. JHM)

Years of Military Service: _____ (To nearest .5 year)

Entry Year in Military Service: _____

Year of Officer Commission: _____

Source of Commission: USMA   ROTC   OCS   Direct (Circle One)

Enlisted Military Service: YES   NO (Circle One)

       If YES, list years of Enlisted Service: _____ (To nearest .5 year)

Combat Tour Deployments: 1   2   3   4   5 (Circle number)

Military Deployments in Last 10 Years**: 1   2   3   4   5** (Circle number)

Total Months in a Combat Zone, Theater of Operations: _____ (To nearest .5 years)

Highest Educational Certificate-Diploma: (Circle One or State Level)

B.A.   B.S.   M.A.   M.S   PhD   EdD   Other: _____

Gender: (Circle One) Male   Female

Marital Status: (Circle One) Married   Single

Race: (Circle One)

White

Black-African American

American Indian or Alaska Native

Asian

Native Hawaiian or Other pacific islander

Some Other Race (Per 2010 U.S. Census, this category includes all other except as listed above)

<u>Five Most Recent Duty Positions</u>:

<u>Duty Description</u>   <u>Location</u>   <u>Period of Duty</u>   <u>Unit of Assignment</u>

_____

_____

_____

_____

_____

Do you know of any U.S. Army major in the FEB-DEC 2011 ILE course that has had an interesting intuitive decisionmaking experience?

YES   NO (Circle One)
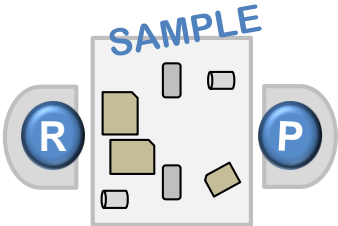
If "Yes," would you like to suggest a U.S. major in the FEB-DEC 2011 ILE for me to contact that may be interested in participating in my research?

YES   NO (Circle One)

If "Yes," state the individual's name and any other information that may assist my contact with this U.S. Army major.

_____

_____

_____

Note. Nothing follows this line for demographic information. JHM

Appendix C - Interview Location Diagram

FIELDNOTE RECORD

Activity Information
WHO: (*Researcher*)
WHAT: (*Activity Description*)
WHERE: (*Location*)
WHEN: Date:
　　From:　　　　To:
WHY: (*Purpose & Intent of Activity*)

(JM Note Ref No.　　　)

Sketch Pad: Images & Ideas
[*Pen sketch identifies key layout of people, equipment, and incidentil items.*]

SAMPLE

Activity Summary: Significant Insights

☐

☐

☐

☐

☐

Figure FG-1. Focus group Setting for five participants and researcher

Notes.
Preferred location by participants at educational center and as coordinated with college**.**
Water bottle provided each participant by researcher.
Primary and secondary audio recorder administered by researcher.

Legend:

Participant: P　Researcher: R

Interview Protocol:

Fieldnote Sheet:

Audio Recorder:

Notepad:

Water Bottle:

Table:

Chair:

Appendix D - Interview Questions Protocol

SAMPLE

Introductory Note. Each participant will arrive at the semi-structured interview knowing the purpose is to explore their perception and understanding of intuitive decisionmaking. The researcher-participant dialogue will invite personal and vicarious experience in intuitive decisionmaking in a time constrained situation during military duties. [This baseline was adapted to each participant with the intent of exploring perception and understanding as the participant provided responses.]

Shall we start the interview? The audio recording is now on.

Note. After reviewing the central problem, main research questions, and building a casual talking rapport with the participant, state that the interview questions and dialogue are about to begin. This introductory segment of the protocol builds rapport with the participant and accents the value participant narrative and that each individual owns their own recollection of "how'" events occurred. These reflections can be recognized as uncertain in some instances and a particular meaning often being temporal. Comprehending context is essential to understanding a momentary event, the impact of a particular locale and encompassing environment, and the interrelationships among people.

The central question that I'm exploring is perception of intuitive decision-making by U.S. Army Forces officers in their contemporary military situations and lifelong learning. I'm very interested in any perception you have experienced personally in intuitive decision-making or have discussed from the perspective of other people–vicarious experience.

The overarching problem of this qualitative research is the perplexity of how to understand the phenomenon of intuitive decisionmaking when by definition the concept of intuition is a conundrum.

This interview protocol is based on two research questions:
- **What is a participant's perception on the phenomenon of intuitive decisionmaking?**

• **What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?**

Note. Interview questions are as follows:

1. In your own words, how would you describe intuitive decisionmaking?

2. Have you ever made a decision based on your intuition? (Yes/No)

► *DECISION POINT: If participant shares an intuitive decision experience, continue with the following question series #3 to #18. If the participant does not recall an intuitive event to share, go to question #13 to initiate a different interview sequence with the participant.*]

3. When and where did your intuitive decisionmaking incident occur?

4. What were the conditions of your surroundings that immediately preceded your intuitive decisionmaking?

5. How did you recognize your intuitive decision point within the situational context of time and a requirement to make a decision?

6. Did you feel confident in making your decision? (Yes/No)

7. What physical sensations do you recall at your point of decision?

8. What mental images, if any, do you recall thinking about at this same point of decision?

9. Review what you did as a result of your intuitive decisionmaking?

10. What personal reflections did you have shortly after the intuitive decisionmaking and action?

11. What personal reflections, over time, have you experienced about intuitive decisionmaking and action?

12. As you reflect on your experience using intuition, what influence, if any, did other people have on your decision to act on knowing intuitively what to do?

► *DECISION POINT: If the participant does not recall an intuitive event to share at Question #2, initiate a questions series with question #13 to #18.*

13. What does the U.S. Army state as a doctrinal description of intuitive

decisionmaking?

14. How would you describe intuitive decisionmaking in one word or phrase?

16. What personal value to do place on your intuitive decisionmaking abilities?

17. How do you think intuition impacts on the Army expectation to be adaptive and flexible in decisionmaking?

18. What relationship does critical and creative thinking have with intuition?

19. How would you relate "inquisitiveness" to creative thinking

20. How does creative thinking relate to intuition?

21. How do you think intuition decisionmaking impacts on the Army expectation to be adaptive and flexible in decisionmaking?

22. Do you believe your intuitive decisionmaking is or was appreciated by leaders in your military duties?

23. In your experiences, what aspects affect your self-confidence to make an intuitive decision?

▶ *Summarize the interview with the participant:*

24. To be a more effective intuitive decisionmaker, how would you describe the personal learning that occurred from your intuitive experience?

25. Is there anything else you would like to share about your intuitive decisionmaking experience?

▶ *Conclude the Interview.*

Thank you. Your candid comments are essential to my research on intuitive decisionmaking.

I will contact you to confirm the accuracy of the transcription if words are garbled or other qualifications are appropriate. You will have access to the audio recording if needed.

I will contact you when my research and doctoral defense is completed, and provide you with an electronic copy of my approved dissertation.

Again, thank you very much. The interview is over. I'm turning off the audio recorder now.

JHM

Appendix E - Interview Protocol and Literature Rationale

Central Problem of This Research.

SAMPLE

Note. This technique was used in a developmental stage of qualifying the types of questions to ask in the semi-structured interview. Base on comments during the research proposal, the research committee recommended the value of having a clear rationale for each of the questions to be presented to participants. This format identified a specific purpose for an exploratory question, and related rationales to support the question and purpose.

Shall we start the interview? The audio recording is now on.

The overarching problem of this qualitative research is the perplexity of how to understand the phenomenon of intuitive decisionmaking when by definition the concept of intuition is a conundrum.

Research Questions and Issue-Topical and Procedural Sub-questions

Note. Creswell (2008) presents a schema of a central question and sub-questions of either topical issues or procedural process. [See pp.107-109.] This approach combines with researcher interest of how to explore two central questions.

- **What is a participant's perception on the phenomenon of intuitive decisionmaking?**
- **What personal or vicarious experiences contribute to a participant's perception or understanding of intuitive decisionmaking?**

Introductory Note. Each participant will arrive at the semi-structured interview knowing the purpose is to explore their perception and understanding of intuitive decisionmaking. The researcher-participant dialogue will invite personal and vicarious experience in intuitive

decisionmaking in a time constrained situation during military duties.

▶ *Establish a frame of reference of intuitive decision-making from the participant.*

Note. After reviewing the central problem, main research questions, and building a casual talking rapport with the participant, state that the interview questions and dialogue are about to begin. Clandinin and Connelly (2000) offer four main components to appreciating a participant as they share their experiences: (1) know of the participant's personal history; (2) appreciate aspects of narrative history to more effectively interpret a particular participant's action; (3) recognize that uncertainty and change are norms with a particular meaning often being temporal; (4) comprehend context as essential to understanding a momentary event, the impact of a particular locale and encompassing environment, and the interrelationships among people.

The central question that I'm exploring is perception of intuitive decision-making by U.S. Army majors in their contemporary military situations and lifelong learning. I'm very interested in any perception you have experienced personally in intuitive decision-making or have discussed from the perspective of other people – vicarious experience.

1. **In your own words, how would you describe intuitive decision-making?**

▶ *Describe Phenomenon of Intuition.* Gain participant frame of reference in "habit of mind." *Notes on rationale:*

Rationale: Defining terms ensures a common perspective with which to pursue subsequent questions and perception or understanding. Polanyi (1958), in his theory of personal knowledge, states that "tacit knowing is more fundamental than explicit knowing" (p. x). Tacit and explicit knowledge are exclusive of each other; however, it is the tacit subsidiary elements in a particular context that provide cognitive or affective cues that may emerge as epiphany. "All thought contains components of which we are subsidiarily aware in its focal content of our thinking, and that all thought dwells in the subsidiaries, as if they were part of our body" (1966, p. x).

Rationale: A description of tacit knowledge by Sternberg (1988) in *The Triarchic Mind: A New Theory of Human Intelligence states*, "…*tacit knowledge*: knowledge that is not openly expressed or stated" (p.213).

Rationale: In *Learning in Adulthood,* Merriam, Caffarella, and Baumgartner (2007) cite Mezirow (2000) that a frame of reference is a meaning perspective based on *assumptions* [emphasis added] that shape how an individual feels and believes, and as a result filters personal meaning. [See pp.132-133.]

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2. **Have you ever made a decision based on your intuition? (Yes/No)**

▶ *Gain Co**mmitment.*** Engage participant on how to proceed with exploring the phenomenon of intuitive decisionmaking**. *Notes on rationale:***

Rationale: Polanyi (1996) says, "we can know more than we can tell" (p. 4). He immediately follows this belief statement that even though this appears obvious, the concept is "not easy to say exactly what it means" (p.4).

Rationale: Schön (1987) asserts that "inherent in the practice of the professional we recognize as unusually competent is a core of artistry"….There are an art of problem framing, an art of implementation, and an art of improvisation – all necessary to mediate the use in practice of applied science and technology" (p. 13). Schön uses the term "professional artistry" to refer to the kinds of competence practitioners sometimes display in unique, uncertain, and conflicted situations of practice….they do not depend on our being able to describe what we know how to do or even to entertain in conscious thought the knowledge that our actions reveal" (p. 22).

Rationale: Wertheimer (1945) describes the trial of productive thinking with creativity "when the situation is not grasped because it is too complex, too confusing,...the situation must be structurally understood so that the problem is grasped in its structural role as part of a given situation. Often this transformation actually explodes, revolutionizes the old view" (p. 239).

▶ *Prompt the participant to describe a personal intuitive decision-making event:*

3. **When and where did your *intuitive decision-making* incident occur?**

▶ *Setting.* Allow the participant to tell the story and take ownership of the way the vignette is expressed. *Notes on rationale:*

Rationale: Daloz (1999) in *Mentor: Guiding the Journey of Adult Learners*, notes that personal narrative provides an entryway to how a participant views an environment (pp. 23 and 31).

Rationale: "Often the subject [participant] is lacking in breadth of view. Even when he has it at the beginning, he may lose it in the process because he is busy with details or falls into a piecemeal attitude" (Wertheimer, 1945, p. 240).

Rationale: Bandura (1997) spotlights that "enactive mastery produces stronger and more generalized efficacy beliefs than do modes of influence relying solely on vicarious experiences, cognitive simulations, or verbal instruction" (p. 80).

4. **What were the conditions of your surroundings that immediately preceded your intuitive decision-making?**

▶ **Conditions.** Allow the participant to provide details of their story, in their own words and expression, and make connections of the multiple influences on a particular event. ***Notes on rationale:***

Rationale: Noted by Mustakas (1994) in *Phenomenological Research Methods*, "Phenomenology is committed to description of experiences, not explanations or analyses…In descriptions, one seeks to present in vivid and accurate terms , in complete terms, what appears in consciousness and in direct seeing – images, impressions, verbal pictures…" (pp. 58-59).

Rationale: Sternberg (1988) says, "mapping, another inductive process, is the recognition of a relationship between two different relationships. Thus, it is related to, but nevertheless different from inference, which is the recognition of a relationship between two terms or single items" (p. 130).

Rationale: Wertheimer (1945) proposes that the dynamics of productive thinking is "not of the character of an add-summative aggregation, of a succession of piecemeal, chance happenings in which items, associations, operations just occur. They are not arbitrary in nature" (p. 235).

5. **How did you recognize your decision point within the situational context of time and a pressing requirement to make a decision?**

▶ *Recognition.* Encourage the participant to describe the moment of intuition, that is, that point of conscious clarity in a solution to a problem and the confidence to act on the intuition. ***Notes on rationale:***

Rationale: Van Manen (1990) spotlights the importance of constantly attending to the original question of the phenomenological research. The "what is it like" question and manner of the researcher "…must "pull" the reader [participant] into the question in such a way that the reader [participant] cannot help but wonder about the nature of the phenomenon…teaches the reader [participant] to wonder…" (p.44).

Rationale: Bandura (1997) *in Self-Efficacy; the Exercise of Control,* notes "Perceived efficacy not only sets the slate of options for consideration but also influences other aspects of decisionmaking" (p.451). He further states, ""…people must draw on a reliable knowledge base, use their cognitive skills efficiently to ferret out relevant information, construct options, and test and revise their strategic knowledge based on the results of their decisions" (p.225). This reinforcement might enhance the implicit aspects of intuition, and "...growth of intrinsic interest is fostered through affective self-reactive and self-efficacy mechanisms" (p.219).

Rationale: Sternberg (1988) interrelates three concepts that approach both impulsive and reflective styles of problem solving. He says, "in selective encoding, you must choose the right elements to encode among the often numerous and irrelevant bits of information presented by the problem. In selective combination, there may be possible ways for the encoded elements to be combined or otherwise integrated; the trick is to select the right way of combing them. In selective comparison, new information must be related to one or more of many possible old pieces of information" (p. 180). In choosing among these options, Sternberg also notes that other essential

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ingredients are "a store of prior knowledge," (p. 180), monitoring and evaluating progress, and personal motivation, that is, "those who are willing to put in the necessary effort" (p. 181).

6. **Did you feel confident in making your decision? (Yes/No)**

▶ *Self-efficacy.* Probe the participant's self-efficacy on intuitive decisionmaking. Engage participant on how to proceed with exploring his or her intuitive decisionmaking. ***Notes on rationale:***

Rationale: "The self is socially constituted, but, by exercising self-influence, individuals are partial contributors to what they become and do. Moreover, human agency operates generatively and proactively rather than just reactively" (Bandura, 1997, p. 6). Bandura states that "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3).

Rationale: In *The Triarchic Mind,* "personality can enhance intelligence or detract from it" (Sternberg, 1988, p. xii).

Rationale: "When a practitioner makes sense of a situation he perceives to be unique, he *sees* [emphasis added by Schön] it as something already present in his repertoire" (Schön, 1987, p. 67).

7. **What physical sensations do you recall at this point of decision?**

▶ **Physical.** Encourage the participant to describe the moment of intuition in physical senses, that is, physical signals that appeared at the moment of intuition. ***Notes on rationale:***

Rationale: Polanyi (1966) uses an example of a blind man probing with the tip of his cane. "Our awareness of its impact on our hand is transformed into a sense of its point touching the objects we are exploring. This is how an interpretative effort transposes meaningless feelings into meaningful ones, and places these at some distance from the original feeling" (pp. 12-13).

Rationale: Bandura (1997) in *Self-Efficacy; the Exercise of Control,* states, "…people must draw on a reliable knowledge base, use their cognitive skills efficiently to ferret out relevant information, construct options, and test and revise their strategic knowledge based on the results of their decisions" (p.225).

Rationale: Bandura (1997) cites Cioffa (1991) who "argues convincingly that it is not the sheer intensity of physical sensations or the amount of attention paid to them that is of import, but rather how they are perceived and interpreted. Somatic information is processed into percepts. It is the percepts that serve as the information base for judgment" (p. 110).

8. **What mental images, if any, do you recall at this same point of decision?**

▶ **Cognitive.** Invite the participant to describe what pictures-images of the decision emerged from the intuition. ***Notes on rationale:***

Rationale: Schön (1987) provides an example of perceiving and learning a design studio. "If we were to apply Polanyi's [1958] view to the experience of students in the design studio, we would say, correctly, that learning to design sometimes takes the form of making explicit what one already knows how to do…[and cites Petra] intuitively you look at the shape and you know it is wrong, but it's hard to get down to the reason" (p. 87).

Rationale: Merleau-Ponty (1945/1962) in *Phenomenology of Perception* describes sensation. "…..we first of all discover that the conditions external to the sensory field do not govern it part for part, and that they exert an effect only to the extent of making possible a basic pattern – which is what Gestalt theory makes clear" (p.12).

Rationale: Epstein (2008) in *Intuition in Judgment and Decision Making* states, "Pattern recognition is an important aspect of intuitive processing, but is hardly a sufficient defining attribute. The experiential system does not respond only to patterns… the defining attribute of intuition is the tacit information that is acquired by automatically learning from experience" (p.31).

9. **Review what you did as a result of your intuitive decision-making?**

▶ *Decision Outcome.* Let the participant identify what personal action was taken and why the action necessary. ***Notes on rationale:***

Rationale: Senge (1990) in *Schools That Learn: A Fifth Discipline Field book for Educators, Parents, and Everyone Who Cares About Education* states that "…mental models are usually tacit…Differences between mental models explain why two people can observe [experience] the same event and describe it differently. They are paying attention to different details. The core task of the discipline of mental models is bringing tacit assumptions and attitudes to the surface so people can explore and talk about their differences and misunderstandings with minimal defensiveness" (p.67).

Rationale: "Central to this theory [gestalt according to Wertheimer] is the transition from piecemeal aggregation, superficial structure, to the objectively better or adequate structure" (Wertheimer, 1945, p. 243). This perception and appreciation is the gestalt and provides a meaning specific to a particular context.

Rationale: Schön (1987) surmises that "when the practitioner reflects-in-action in a case he perceives as unique, paying attention to phenomena and surfacing his intuitive understanding of them, his experimenting is at once exploratory, move testing, and hypothesis testing. The three functions are fulfilled by the very same actions" (p. 72).

▶ **Probe participant self-assessment of the Intuitive experience:**

10. **What personal reflections did you have shortly after the intuitive decision-making and action?**

▶ ***Self-Assess and Know.*** Identify how the participant describes specific event details or a broad, holistic panorama. ***Notes on rationale:***

Rationale: Merleau-Ponty (1962) in *Phenomenology of Perception* says, "When we come back to phenomena we find, as a basic layer of experience, a whole already pregnant with an irreducible meaning: not sensations with gaps between them, into which memories may be supposed to slip, but the features, the layout of a landscape or a word, in spontaneous accord with the intentions of the moment, as with earlier experience" (p.25).

Rationale: In attempting to understand what occurs in the "*process* of action" [emphasis added by Schön], he suggests, "examine the 'joints' that connect the parts of the performance I try to reproduce, recognize intermediate stages of the tasks of construction, differentiate aspects of my performance…" (Schön, 1987, p. 110).

Rationale: Bandura (1997) in *Self-Efficacy; the Exercise of Control* promotes his causal model of triadic reciprocal causation. "In this model, cognitive and other personal factors, behavior, and environmental events all influence one another bidirectionally" (p.454).

11. **What personal reflections, over time, have you experienced about intuitive decision-making and action?**

▶ ***Self-Assess and Make Meaning.*** Listen to how the participant has created meaning from the intuitive experience. ***Notes on rationale:***

Rationale: Van Manen (1990) in *Researching Lived Experience: Human Science for an Action Sensitive Pedagogy* describes the importance of lived experience in phenomenological research. He says, "The aim of phenomenology is to transform lived experience into a textual expression of its essence – in such a way that the effect of the text is at once a reflexive re-living and a reflective appropriation of something meaningful: a notion by which a reader [participant] is powerfully animated in his or her own lived experience" (p. 36).

Rationale: Wertheimer (1945) remarks in *Productive Thinking* that "those are marvelous moments when, after a long period of diligent, careful study or experimentation, a way opens for structural understanding; or when an experiment brings results which do not fit, which even contradict a given structural view, and the process then proceeds under this challenge" (p. 245).

Rationale: Bandura (1997) states that "in natural environments, multiple decisions must be made from a wide array of information generated by ongoing activities under time constraints and with social and self-evaluative consequences"…."Effective decisionmaking in complex and dynamic environments requires generative capability in which various cognitive skills are applied to ferret out information, interpret, and integrate feedback, test, and revise knowledge, and implement selected options" (p. 451).

12. **As you reflect on your experience using intuition, what influence, if any, did other people influence have on your decision to act on knowing intuitively what to do?**

▶ *Personal versus Communal/Role Model.* Have the participant recognize if role modeling is a perceived way to enhance intuition and the tacit knowledge that energizes an intuitive thought. *Notes on rationale:*

Rationale: In *Self-Efficacy; the Exercise of Control,* Bandura (1997) cites studies that suggest in addition to a bias effect that emotions can evoke, other impacts on decision-making can be individual judgment with simplified rules, or judgment "…easily swayed by salient instances that spring readily to mind…unduly biased by the standards of attainment exemplified by others to whom they happen to be exposed or whom they select without much consideration of their appropriateness" (p.115).

Rationale: Polanyi (1958) states that, "connoisseurship, like skill, can be communicated only by example, not by precept…you must go through a long course of experience under the guidance of a master" (p. 54).

Rationale: Schön (1987) promotes a dialogue between "coach" and student in the context of design. "Reflection-in-action becomes reciprocal when the coach treats the student's further designing as an utterance, a carrier of meanings…and responds to her interpretations…which the student may, in turn, decipher anew and translate into new design performance" (p. 101). He poses that reflection-in-action can be self-analysis of "What is he really doing?" or "What am I really doing?" (p. 110).

13. **What does the U.S. Army state as a doctrinal description of intuitive decision-making?**

▶ *Army Doctrinal Knowledge.* Establish level of participant knowledge and understanding of U.S. Army doctrinal definition of intuitive decision-making. *Notes on rationale:*

Rationale: Intuitive decisionmaking is defined in Army Field Manual 6-0. *Mission Command: Command and Control of Army Forces* (2003) as follows; "intuitive decisionmaking is the act of reaching a conclusion which emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character." (p. 2-4).

Rationale: FM 5-0 *The Operations Process* (2010) describes intuitive decisionmaking as "sometimes that knowledge appears as immediate knowing or feeling (intuition)" (p. 1-6).

Rationale: FM 6-22 *Army Leadership: Competent, Confident, and Agile* (2006) says that, "often, leaders must juggle facts, questionable data, and gut-level feeling to arrive at a quality decision" (p. 6-2). One of the ways to develop learning is an approach of lifelong learning. FM 6-0 describes this type of learning as "the individual choice to actively and overtly pursue knowledge, the comprehension of ideas, and the expansion of depth in any area in order to progress beyond a

known state of development and competency" (p. 8-3).

14. **How would you describe intuitive decisionmaking, or is there one word you can use to describe intuition?** [If one word is offered, ask for what that means to the participant.] **What does that mean to you?**

▶ *Personal Meaning.* Seek a personal meaning in the words of the participant. ***Notes on rationale:***

Rationale: In *The Triarchic Mind,* Sternberg (1988) states that many problems "require flashes of insight or 'leaps of logic' on the part of the solver, rather than prior [explicit] knowledge or laborious computation" (Sternberg, 1988, p. 171).

Rationale: Schön (1987) centers much of his concept for educating reflective practitioners in intrapersonal and reciprocal mentor to student relationships on "reflection-in-action" (the 'thinking what they are doing while they are doing it') that practitioners sometimes bring to situations of uncertainty, uniqueness, and conflict" (p. xii). His exemplar is with architectural design students; however, Schön's principles appear to be applicable to a wide range of personal and professional endeavors.

Rationale: Polanyi (1966) provides several avenues to approach an understanding of tacit knowing and its effect on intuitive decisionmaking. One of the relationships is a functional relationship, using anatomical terms of proximal and distal. Distal is the point of overt awareness at any point in time. The proximal, that is, "in an act of tacit knowing we *attend from* [emphasis added by Polanyi] something for attending *to [*emphasis added by Polanyi] something else" (p. 10) The distal point is one of focal awareness; the proximal, even though the vantage frame of reference may be closer to the individual, is subsidiary and exclusive of the focal point of understanding.

15. **What personal value to do place on your intuitive decision-making abilities**?
▶ *Self-Assess Confidence.* Describe the way the participant values his or her personal intuition in order to make intuitive decisions. ***Notes on rationale:***

Rationale: Perception, as described by Merleau-Ponty (1962) in *Phenomenology of Perception,* posits "We must not, therefore, wonder whether we really perceive a world, we must instead say: the world is what we perceive. In more general terms we must not wonder whether our self-evident truths are real truths, or whether, through some perversity inherent in our minds, that which is self-evident for us might not be illusory in relation to some truth in itself."

Rationale: Polanyi (1966) believes that "perception has this inexhaustible profundity, because what we perceive is an aspect of reality, and aspects of reality are clues to boundless yet undisclosed, and perhaps yet unthinkable, experiences" (p. 68).

Rationale: In *The Tacit Dimension*, Polanyi (1966) bridges scientific research and qualitative quest on the topic of discovery. He says. "we start the pursuit of discovery by pouring ourselves into the subsidiary elements of a problem and we continue to spill ourselves into further clues as we advance further, so that we arrive at discovery fully committed to it as an aspect of reality" (p. 80).

16. **How do you think intuition impacts on the Army expectation for you to be adaptive and flexible in decisionmaking?**

▶ *Self-Assess Personal Meaning.* Describe the way the participant models himself or herself as a leader who uses both deliberate and intuitive decisionmaking skills. *Notes on rationale:*

Rationale: "Creativity constitutes one of the highest forms of human expression. Innovativeness largely involves restructuring and synthesizing knowledge into new ways of thinking sand of doing things. It requires a good deal of cognitive facility to override established ways of thinking that impede exploration of novel ideas and search for new knowledge" (p. 239).

Rationale: Sternberg (1988) states his triarchic theory of human intelligence as comprising three parts: a componential part relating to the "internal" world of the individual; an "experiential" part that relates the internal and external world of the individual; and, a contextual part that relates to the external world within which the individual exists. "The components are applied to experience in order to serve three contextual functions – adaptation, selection, and shaping" (p. 660.

Rationale: In *The Tacit Dimension*, Polanyi (1966) offers that "the act of discovery appears personal and indeterminate. It starts with the solitary intimations of a problem, of bits and pieces here and there which seem to offer clues to something hidden. They look like fragments of a yet unknown coherent whole. The tentative vision must turn into a personal obsession; for a problem that does not worry us is no problem: there is no drive in it, it does not exist" (75).

▶ *Summarize the interview with the participant:*

17. **To be a more effective intuitive decisionmaker, how would you describe the personal learning that occurred from your intuitive experience?**

▶ *Assess self-efficacy.* Have the participant project personal learning that occurred from the intuitive experience*. Notes on rationale:*

Rationale: Merleau-Ponty (1962) in *Phenomenology of Perception* describes cognition. "But the fact that formalization is always retrospective proves that it is never otherwise than apparently complete, and that formal thought feeds on intuitive thought…in reality the place in which certainty arises and in which a truth makes its appearance is always intuitive thought, even though, or rather *precisely because* [italics Merleau-Ponty], the principles are tacitly assumed

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there" (p. 448). He states further, "It is indeed true that perceptual structures do not always force themselves upon the observer; there are some which are ambiguous. But these reveal even more effectively the presence within us of spontaneous evaluation: for they are elusive shapes which suggest constantly changing meaning to us" (p. 512).

Rationale: In *Self-Efficacy; the Exercise of Control,* Bandura (1997) says "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (p. 3). "According to social cognitive theory, growth of intrinsic interest is fostered through affective self-reactive and self-efficacy mechanisms" (p. 219).

Rationale: Polanyi (1964) states, We can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell" (p. x). He explains further that, "things of which we are focally aware can be explicitly identified; but no knowledge can be made *wholly explicit* [emphasis added by Polanyi]" (p. x). "Skillful knowing and doing is performed by subordinating a set of particulars, as clues or tools, to the shaping of a skillful achievement, whether practical or theoretical. We may then be said to become 'subsidiarily aware' of these particulars within out 'focal awareness' of the coherent entity that we achieve" (p. xiii).

18. **Is there anything else you would like to share about your intuitive decision-making experience?**

▶ *Relevance.* Allow the participant the ability to express other aspects on the intuitive experience that the interview process has raised to consciousness, or if not asked in the interview, are important for the participant to share. ***Notes on rationale:***

Rationale: Stake in *The Art of Case Study Research* (1995) accents that, "Issues are not simple and clean, but intricately wired to political, social, historical, and especially personal contexts...in order to force attention to complexity and contextuality" (pp.16-17). There may be issues that the participant wants to share that have not been specifically asked.

Rationale: Houle in *The Inquiring Mind* (1961) recommends asking the participant if any questions exist that have not been asked, or whether he [participant] had thought of anything he would like to add to the interview" (p. 86). This can be done as part of the recorded interview or after conclusion of the interview if the researcher senses that the participant may want to talk at first without an audio recording.

Rationale: Guba and Lincoln (1981) suggest that the researcher summarize the semi-structured interview main points and gain confirmation that the participant's comments have been accurately understood. They recommend that the researcher "should seek the respondent's [participant's] recommendations for other audiences and other respondents to whom he [researcher] may talk" (p. 313).

▶ *Conclude the interview:* The researcher concludes the interview with a thank you to the participant, and note when the participant will be contacted to review and comment on the accuracy of the interview transcription. The researcher states that the audio recording has been turned off. If any additional information of value to the researcher is discussed as the participant departs the interview site, the researcher will make an addendum note of what and how the data was presented.

Thank you. Your candid comments are essential to my research on intuitive decisionmaking.

I will contact you as soon as I transcribe your audio recording and request that you confirm its accuracy or give me any appropriate adjustments for discussion. You will have access to the audio recording if needed.

I will contact you when my research and doctoral defense is completed, and provide you with an electronic copy of my approved dissertation.

Again, thank you very much. The interview is over. I'm turning off the audio recorder now.

Appendix F - Field Note Form

SAMPLE

FIELDNOTES RECORD	
Activity Information **WHO**: (Researcher) **WHAT**: (Activity Description) **WHERE**: (Location) **WHEN**: Date: From: To: **WHY**: (Purpose & Intent of Activity) (JM Note Ref No.)	**Sketch Pad: Images & Ideas**
Activity Summary: Key Issues and Insights	

Time	Descriptive Notes	Reflective Notes

Appendix G - Researcher Learning Journal Form

SAMPLE

	Date:
Personal Learning -Reflections Journal:	**Dissertation**

TOPIC:_____

Reference:

❗ *What "one idea" do I want to remember from today?*

Appendix H - Coding Guide

Coding Guide for Qualitative Peer Review

Intuitive Decisionmaking – Moilanen Dissertation Support

Purpose. The purpose of this coding guide is to describe a common process for the qualitative coding of semi-structured interviews in this dissertation. The intent is to (1) provide a baseline group of code words to consider as possible labels, (2) encourage emergent coding by you as a peer reviewer, and (3) identify selected quotes or passages that convey significant expressions and meaning by participants. The intention is to link research objectives on intuitive decisionmaking to participant narratives and the interpretation of their interview transcription.

General. The act of coding is complex due to several cognitive processes that occur as an individual reviews a written narrative. For example, something interesting but generic may emerge in a first impression of browsing a transcript. This initial impression may be improved by an additional reading to improve an understanding that changes with focused reflection.

Reading and reflection, whether nearly simultaneous and casual, or a series of deliberate and thoughtful perceptions over time, may result in revised thinking and cogent interpretation of an interview transcript. Stated simply, this interpretive act is *code*. Saldaña (2009) defines "code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual idea" (p.3).

My purpose for the qualitative study is to explore the nature of intuitive decisionmaking as perceived by intermediate U.S. Armed Forces officers in 2011. This research seeks to discern how the Army officers in this study understand and use intuitive decisionmaking. The contextual setting is the participant's complex and uncertain environment of contemporary military missions and their own lifelong learning.

My research questions probe a participant's perception or understanding of intuitive decisionmaking. Two research questions were discussed in a group of semi-structured oral interview questions. The exploratory research questions are as follows:

- What is a participant's **perception** on the phenomenon of intuitive decisionmaking?
- What **personal or vicarious experiences** contribute to a participant's perception or **understanding** of intuitive decisionmaking?

Confidentiality. Participants in this research have the assurance of anonymity by me as the researcher. This confidentiality pertains also to any peer review of interview transcripts. As one of my expert peer reviewers, sign the nondisclosure statement to confirm the confidentiality of any information you review and comments you provide to me. Return your signed and dated nondisclosure statement with your comments to a participant's interview transcription.

Process. This peer review of a participant transcript is integral to assessing the trustworthiness of the research. As a peer reviewer, you are one of at least three forms of stakeholder checks in my narrative interpretation. Erlandson, Harris, Skipper, and Allen (1993) describe stakeholders as the participants, researcher, and people with a keen interest in the specific research (Thomas (2003).Your professional expertise in U.S. Army leader development confirms the special interest and skill that you have on the issue of intuitive decisionmaking.

As you review a narrative, consider how you identify and group information within sections of the text. Use a style that is comfortable for you. The wide margin on each page of the transcription can be used to capture ideas that emerge as you read, or sketch an image that occurs to you as you "see" aspects a vignette, as described by a participant. If something appears interesting but you cannot identify a particular word that satisfies "the moment," mark the passage with a question mark or exclamation point for your subsequent reflection and comment.

Code. For this research, consider two forms of code. I provide a baseline list of terms (code) and their definitions that are supported by published adult education literature and U.S. Army doctrinal guidance (2003, 2006, 2010, 2011) in the participant's profession. This a priori list is not intended to be comprehensive, but does identify recurring words that describe facets of how intuitive decisionmaking appears to occur. This list is a start point for your interpretation and not a limitation.

Note. I recommend that you **use the enclosed code word guide** which can be placed alongside the participant transcript being reviewed. The concise list of a priori code words is a visual aid for easy reference. **I encourage you to add your own words or phrases as emergent code.**

From your perspective as a peer reviewer, add your own terms or phrases that emerge as you conduct your review. Your personal encoding of narrative can be critical to the eventual interpretation of a participant's perception or understanding of intuitive decisionmaking.

Note. If you do identify a new code word or phrase, **include <u>your concise definition</u> to ensure a common understanding between you and me.**

I recommend that you **use a complete code word** rather than a mnemonic or acronym of the code word. A complete code word may assist you and me in perceiving possible patterns or

categories in review of notations. Creswell (2008) offers that coding may involve between 10 to 30 code words depending on the sophistication of the phenomenon being studied. Saldaña (2009) suggests that five to six codes may be enough to begin coding, but notes than some studies may involve over 80 codes. For this research, I anticipate the list of eventual code words will be in the range of five to 15 code words, and will be adjusted as coding is refined in subsequent comparison and contrast of peer review, participant, and researcher meanings.

How you segregate or collate segments of participant narrative shapes the context that your coding will identify. A way to appreciate context in assessing a participant narrative is a five-question "5W" construct of "who-what-where-when-why." This type of inductive organization is stated in a slightly different four term unit by Lofland, Lofland, Snow, and Anderson (2006) as *actors* [who], *activities* [what], *time* [when], and *place* [where]. A subsequent understanding in this research of *why* intuitive decisionmaking is apparent may be emergent in the process. Either of these methods can assist is framing a vignette or topic within a particular context.

Taylor and Gibbs (2010) present code lists as either non-hierarchical or hierarchical. The non-hierarchical group is a list of code words without any subordination among terms. With a small number of codes, this technique may be useful in visual comparison and contrast. However, the concept of a code hierarchy indicates an additional level of reference detail and interpretation of participant narrative.

Core Category. Code words can be grouped by what is convergent and divergent. As patterns emerge, such clustering may require additional grouping or sub-grouping of codes within a cluster. During this interpretive process, some codes may stand alone, some may be relabeled and coded into groups different from an initial understanding, and some codes may be removed as irrelevant to the focus of the research. Patterns, as they emerge from qualitative coding into categories, must be understood in the specific context of how they were compiled. The characterization of a category can include factors such as frequency of occurrence, sequence of occurrence, explanation as expressed by a participant, or relationships among phenomena.

When you review your coding from the initial code list and any additional code you consider in adding to the list, **identify if your qualitative analysis indicates a potential core category.** This core will be evident if other categories appear as causal conditions preceding the emergence of a core category. **A core category has a subsequent trace as the main causal condition of a significant response action in the phenomenon (perception of intuitive decisionmaking)**, and linkage to consequences of enacting such response or responses (Creswell, 2008).

Themes. The examination of categories will result in a qualitative determination of themes. **According to Saldaña (2009), "a theme is an *outcome* [emphasis added by Saldaña] of coding, categorization, and analytic reflection, not something that is, in itself, coded"** (p. 13). Creswell (2008) states that themes are also called categories and "are similar codes aggregated together to form a major idea" (p. 252).

Creswell (2008) suggests that a coding process will result in five to seven themes. This small number of themes assists a researcher in focusing qualitative description that "is a

detailed rendering of people, places, or events in a setting" (p. 252). The number of themes may be even less once research is complete. Saldaña (2009) cites Walcott (1994) who advises that **"three of anything major seems to be an elegant quantity for reporting qualitative work"** (p. 21).

Code Word Directory

Intuitive Decisionmaking. *Intuitive decisionmaking* is the act of reaching a conclusion which emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character. (*Mission Command*, 2003, p. 2-4).

> **Epiphany.** Epiphany is usually a sudden manifestation or perception of the essential nature or meaning of something.

> **Discovery.** Discovery is the act of insight or knowledge of something for the first time.

Perception. Perception is a keen awareness of explicit and implicit relationships among phenomena through physical cues or cognitive sensation, and the ability to understand the cues or sensation in a particular environment for knowledge.

> **Physical Cue.** A signal to the body in visual, audio, olfactory, tactile, or verbal clue.

> **Cognitive Sensation.** A signal of relationship through explicit or implicit awareness.

Knowledge. Knowledge is a body of information learned by study or experience. Knowledge can be explicit or implicit, or both explicit and implicit in nature.

> **Tacit Knowledge.** Tacit knowledge is an understanding present only when it exceeds the powers of articulation, but even when it exactly coincides with them, as it does when we have acquired it a moment before by listening to or reading a text. [a la Polanyi]

> **Predictive Knowledge.** Predictive knowledge is knowing what is likely to happen if particular events occur, and fosters foresight and adaptation with an assured sense of implicit probability for events in causally ambiguous environments.

> **Metacognition.** Metacognition is the cognitive appraisal and control of one's cognitive activity; that is, thinking about the adequacy of one's own thinking about, deciding to, and solving problems; and if necessary, make corrective adjustments to structure and solve problems.

> **Cognition.** Cognition is an act relating to, being, or involving conscious intellectual activity such as thinking, reasoning, or remembering.

Pattern Recognition. Pattern recognition is an inductive or deductive inference and association that extracts significant features or attributes of data from a domain background using general concepts or clues derived from past experience.

Experience. Experience is knowledge gained by doing something in physical performance or mental simulation.

> **Personal experience.** Personal experience is an experience based on direct personal observation of or participation in events.
>
> **Vicarious experience.** Vicarious experience is an experience realized through imaginative or neural sensation participation in the experience of another person.
>
> **Affective.** A cognitive or somatic signal relating to, arising from, or influencing feelings or emotions.
>
> **Somatic.** A physical signal relating to, or affecting the body as in to see, hear, feel, smell, or speak.
>
> **Role Modeling.** Role modeling is the act of a imitating the behavior of a person with the intention of replicating similar performance.
>
> **Training.** Training is an act of learning a deliberate and progressive activity to perform a task to a desired standard of proficiency with the objective of mastery.
>
> **Performance Feedback.** Performance Feedback is an assessment or evaluation of how a particular action was conducted as compared to an expected standard of performance.
>
> **Lifelong Learning.** Lifelong learning is the individual lifelong choice to actively and overtly pursue knowledge, the comprehension of ideas, and the expansion of depth in any area in order to progress beyond a known state of development and competency.

Education. Education is the act or process of imparting knowledge or skills to another or oneself, and the understanding gained from that information.

> **Critical Thinking.** Critical Thinking is a deliberate cognitive process of thought whose purpose is to discern truth in situations where direct observation is insufficient, impossible, or impractical.
>
> **Creative Thinking.** Creative thinking is a process of considering novel approaches to approaching a phenomenon which may lead to insights, fresh perspectives, and ways to understand a condition or conceive ways to innovate.

Inquisitiveness. Inquisitiveness is a personal or professional inclination to investigate the meaning of a phenomenon and its relationship to a surrounding contextual environment in time and space.

Innovate. The act to do something in a new way.

Joint Professional Military Education. Joint professional military education consists of the rigorous and thorough instruction and examination of officers of the armed forces in an environment designed to promote a theoretical and practical in-depth understanding of joint matters and, specifically, of the subject matter covered. (U.S. Title 10, Ch 107.)

Intelligence. Intelligence is the ability to learn and understand how to deal with problems.

Inductive Reasoning. Inductive reasoning is an act involving conscious intellectual activity that assimilates aspects of a phenomenon with the intention of creating an understandable holistic domain.

Practical Intelligence. Practical intelligence is the purposive adaptation to, selection of, and shaping of real-world environments relevant to one's life and abilities.

Mental Simulation. Mental simulation is a mental rehearsal of a motor act without performing any overt movement that anticipates the probable result before initiating of an action.

Contextual Similarity. Contextual similarity is a situational evaluation of a phenomenon that identifies features or conditions as corresponding to other phenomena of a common environment.

Contextual Contrast. Contextual contrast is a situational evaluation of a phenomenon that identifies divergence of features or conditions to other phenomena of a common environment.

Judgment. Judgment is an ability to assess situations or circumstances shrewdly and to draw feasible conclusions.

Self-efficacy. Self-efficacy is a belief in one's capabilities to organize and execute a course of action required to produce a desired objective.

Intrinsic Motivation. Intrinsic motivation is an implicit self-regulating cue to think and act autonomously with an expectation, when positive, of satisfactory feeling or competent performance.

Confidence. Confidence is a feeling or consciousness of one's power or belief that one will act in a correct, appropriate, or effective way.

Courage. Courage is the mental or moral strength to venture, persevere, and withstand danger, fear, or difficulty in deciding and acting in a particular manner.

Uncertainty. Uncertainty is a cognitive state that something being attended to is doubtful or unknown.

Anxiety. Anxiety is an overwhelming sense of apprehension, doubt, or fear often marked by physical indications such as sweating, tension, and increased pulse.

Bias. Bias is a distorted appreciation of a phenomenon based on personal or vicarious experience and resulting preference.

Expertise.
Expertise is the demonstration of exceptional knowledge, experience, or skill in a particular domain.

Artistic. Artistic is an imaginative and aesthetic appreciation and skill in arrangement or execution of a task.

Adaptability. Adaptability is the ability to shape conditions and respond effectively to a changing operational domain with appropriate, flexible, and timely actions.

Mental Agility. Mental agility is an ability to anticipate or adapt to uncertain or changing situations by thinking through second- and third-order effects when current decisions or actions are not producing the desired effects.

Domain Expertise. Domain expertise is superior achievement of understanding and skill in a particular subject through professional training and practical experience.

Special Considerations in Peer Review Comments.

If you identify a passage of **"thick, rich narrative"** as a significant impression, or identify text that you would consider a **"quotable quote,"** highlight them with either a vertical line in the margin, use a color highlight, or frame the text in a box shape. Add your margin comments.

Contact Information. I am available for any assistance as you conduct your expert peer review. I am available during normal business hours at [telephone number redacted]. I will provide you with my home telephone number when we coordinate the peer reviews.

At your convenience, I can personally pick up your completed peer review packet at your place of work. If you prefer to state coding and comments electronically rather than handwritten

on a document, you may email your peer review response as a .pdf document to me at [email address removed from this dissertation appendix] Thank you for your time and intellect in supporting my doctoral research project. I will be pleased to assist you in any similar manner if your regular duties require an external qualitative assessment of a project.

Original Signed

2 Encl   JON H. MOILANEN
Code Reference Guide   Doctoral Candidate, ABD
Nondisclosure Statement   Kansas State University

Code Reference Guide		
Peer Note	Code Word	Code Definition

	Intuitive Decisionmaking
	   Epiphany
	   Discovery
		Intuitive decision making is the act of reaching a conclusion which emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character. (*Mission Command*, 2003, p.2-4).

	Perception
	   Physical Cue
	   Cognitive Sensation
		Perception is a keen awareness of explicit and implicit relationships among phenomena through physical cues or cognitive sensation, and the ability to understand the cues or sensation in a particular environment for knowledge.

	Knowledge
	   Tacit
	   Predictive
		Knowledge is a body of information learned by study or experience. Knowledge can be explicit or implicit, or both explicit and implicit in nature.

	Pattern Recognition
	   Inductive Reason
	   Deductive Reason
		Pattern recognition is an inductive or deductive inference and association that extracts significant features or attributes of data from a domain background using general concepts or clues derived from past experience.

	Experience
	   Personal
	   Vicarious
		Experience is a knowledge gained by doing something in physical performance or mental simulation.

	Education
	   Critical Thinking
	   Creative Thinking
		Education is the act or process of imparting knowledge or skills to another or oneself, and the understanding gained from that information.

	Intelligence
	   Mental Simulation
	   Judgment
		Intelligence is the ability to learn and understand how to deal with problems.

	Self-efficacy
	   Confidence
	   Courage
		Self-efficacy is a belief in one's capabilities to organize and execute a course of action required to produce a desired objective.

	Expertise
	   Mental Agility
	   Adaptability
		Expertise is the demonstration of exceptional knowledge, experience, or skill in a particular domain.

	(To Be Determined) *See next page.*	***Note.*** Any new code word used a by peer reviewer requires a definition. Sub-category words in the attached code word directory may be useful for your consideration also. JHM
1 of 2		

Code Reference Guide: New Code Possibilities (Continued)		
Peer Note	***New* Code Word**	**Code Definition**

Reviewer Notes:

Nondisclosure Statement

This nondisclosure statement pertains to peer review or transcription of semi-structured oral interviews as part of doctoral research and a dissertation by the researcher (Jon H. Moilanen) and participants at the U.S. Army Command and General Staff College (USACGSC) in 2011. This qualitative research has been approved by USACGSC and Kansas State University (KSU).

Each participant has been informed of the confidentiality of their participation. Any references in the dissertation will use pseudonyms to protect the confidentiality of each participant.

> JON H. MOILANEN
> Doctoral Candidate ABD
> Kansas State University

Nondisclosure Agreement

I agree to maintain the confidentiality of all information and comments related to the audio recordings and/or transcripts of participant interviews conducted between the researcher, Jon H. Moilanen, and the participant. I will not use or disclose any of the contents of interview materials to anyone other than Jon H. Moilanen.

Signature: _____

Printed Name: _____

Date: _____

Appendix I - Peer Reviewer Expertise Summaries

The subject matter experts used as peer reviewers in this research were faculty or staff member of the U.S. Army Command and General Staff College (CGSC), U.S. Army Management Staff College (AMSC), and a subject matter expert at the U.S. Army Center for Army Leadership (CAL). The researcher discussed ongoing research with professionals in the Army Research Institute for the Behavioral and Social Sciences (ARI); however, ARI subject matter experts were not used as part of the peer review.

This coordination and feedback reflected the personal and professional opinions of the subject matter experts, and was *not* considered, in any manner, an official acknowledgement of the professional organization in which the peer reviewer worked. Peer review was the individual opinion of each expert peer reviewer.

The peer reviewers have been identified with pseudonyms as follows:

- Adam.
- Frederick.
- Gregory.
- Theodore.
- Malcolm.

ADAM

Adam is a Professor of Civilian Leadership Education at the U.S. Army Management Staff College. He is also a researcher and writer supporting the development of Army Civilian Education topics specifically in the area of problem solving, learning styles, and faculty self-efficacy. He co-authors papers on a wide range of topics in the area of leadership and motivation.

As an adult educator, he has taught in the academic classroom at the civilian undergraduate level and military college-university graduate level in both distributed learning and resident courses. His undergraduate degree in education is from Bemidji State University. He has a Masters in Business Administration from Syracuse University, a Master's of Science from Kansas State University and an Adult Education Doctorate from Kansas State University.

He served over 24 years as a non-commissioned and commissioned officer in the active component of the U.S. Army. He retired as a lieutenant colonel. Active duty experience included key command and staff positions from with the Adjutant General Corps. He has also served on the staff of Headquarters, United States Army Europe.

Teaching experience includes small group instruction at the U.S. Army Combined Arms Services Staff School (Instructor), the U.S. Army Command and General Staff College (Assistant Professor of Logistics and Resource Management), and the U.S. Army Force Management School (Professor of Civilian Education and Leadership). Civilian teaching experience includes distributed learning with Central Texas College and resident instruction for Upper Iowa University in the areas of business and economics.

Adam has published articles in the Adjutant General Corps professional journal, *1776* as well as the Army Management Staff College *eZine*. He has presented papers at various adult education conferences such as the Adult Education Research Conference (AERC) and the annual conference of the American Association for Adult and Continuing Education (AAACE).

FREDERICK

Frederick is a leader, educator, scholar, and Soldier. Currently he is an Assistant Professor Teaching Committee Supervisor at the U.S. Army's Command and General Staff College (CGSC) at Fort Leavenworth, Kansas. He is responsible for integrating the efforts of a college teaching team into a coherent section of five CGSC staff groups. Each staff group is responsible for the joint professional military education of approximately 16 students. In his current position, he presents graduate level lectures, seminars and other instruction to CGSC resident and extended campus course students.

His military career encompassed three decades of service to the United States of America. He commanded with distinction as an Infantryman from the platoon through the battalion level, and is a veteran of Operation Desert Storm where he served with an Army Special Operations unit.   His instructional assignments within U.S. Army Training and Doctrine Command (TRADOC) have led to over 20 years experience as an instructor of tactics, leadership, and command.

Frederick's civilian career has included over six years of corporate experience with successful ventures locally in retail business and at Sprint-Nextel. His background as an adult educator has been significantly enhanced with the addition of a doctorate in adult education. His research interest and focus on stress has led to workshops, presentations, and publications on and about that topic and its impact in an academic environment.

GREGORY

Gregory is a Supervisory Program Manager (Leader Development) and serves as the Chief, Concepts and Requirements Team in the U.S. Army's Center for Army Leadership (CAL). His numerous functions in this capacity include military analysis, research, and writings that support the development of U.S. Army doctrine and policy for leader development and unit readiness. He authors and contributes to a wide-range of Army training and educational products to include Army training doctrine, strategic whitepapers, and special leadership topics of interest.

As an adult educator, he has taught Leadership and Sociology as an Assistant Professor at the United States Military Academy (West Point) at the undergraduate level and Managerial Leadership for Webster University at the graduate level. He has instructed leadership in the Command and General Staff Officer Course (CGSOC) and as Chief, Civilian Leadership and Training Division in the Center for Army Leadership, he supervised a contingent of 19 facilitators with a global mission to develop the Department of the Army Civilian workforce. He was a principle facilitator for the Organizational Leadership for Executives Course and the Leadership Education and Development Course for Army interns. These opportunities span over three decades, interspersed with years of practical experience in the field and institutional environments of the U.S. Army. His undergraduate degree in History is from Old Dominion University, Norfolk, VA and his graduate degree in Sociology was earned at The College of William and Mary, Williamsburg, VA.

He served over 22 years as a commissioned officer in the active component of the U.S. Army and retired as a Lieutenant Colonel (USA Retired). He served in various commands and organizational levels from Battalion to Combatant Command. He is a distinguished graduate of the U.S. Marine Corps University Command and Staff Course (CSC), In addition to his command and staff assignments, he has served in numerous U.S. Army Training and Doctrine Command (TRADOC) capacities to include the Field Artillery School, and as the Secretary of the General Staff to the TRADOC Commander. His last military duty was Deputy Director of the Center for Army Leadership at the U.S. Army Combined Arms Center.

Gregory is a published author in the U.S. Army's *Military Review* professional journal and authored Appendix E (Objective Force Leader Characteristics and Skills) in the Army Training and Leader Development Panel Report (Officers).

THEODORE

Theodore is a retired U.S. Naval Officer with 28 years of military service in a variety of positions including as an electronics technician, a naval flight officer, and commanding officer of a navy recruiting district. He is currently an Assistant Professor at the U.S. Army Command and General Staff College (CGSC) where he teaches faculty development and curriculum development courses for the Faculty and Staff Development Division. He has previously taught national strategy, joint operations, and homeland security courses in the college's Directorate of Joint, Interagency, and Multinational Operations.   He also currently teaches graduate-level courses in adult education as an adjunct professor for Kansas State University.

He earned a bachelor's degree in electrical engineering from the University of Kansas in Lawrence, KS, a master's degree in national security and strategic studies from the U.S. Naval War College in Newport, Rhode Island, and Master's and doctoral degrees in adult education from Kansas State University in Manhattan, Kansas. He has published articles related to homeland security, and has presented at national conferences on homeland security, experiential learning, and critical thinking topics.

MALCOLM

Malcolm is an Associate Professor at the U. S. Army Command and General Staff College (CGSC) where he has instructed for over a decade in military and civilian capacities. He instructs on topics ranging from tactical/operational/strategic logistics, force projection, and maneuver sustainment. He has also authored, researched, and teaches an elective on the characteristics of domestic incidents as part of the CGSC Homeland Security Studies Program.

As an adult educator, he has taught in the academic classroom at the civilian graduate level and military college-university graduate level. He also teaches graduate level courses on-line and is an Adjunct Faculty member for Kansas State University in the College of Veterinary Medicine in the Department of Diagnostic Medicine/Pathobiology. His undergraduate degree in agricultural education is from Virginia Tech and also has a master's degree in vocational education from Virginia Tech. He has another master's degree from the U.S. Army Command and General Staff College in operations research. His Ph.D. in Adult, Occupational, and Continuing Education was earned from Kansas State University.

He served over 20 years as a commissioned officer in the active component of the U.S. Army and retired as a lieutenant colonel (USA Retired). His military service included various command and staff positions in both peace and conflict within the United States, Germany, Saudi Arabia, Iraq, Kuwait, Korea, Djibouti, Ethiopia, Macedonia, Kenya, and Kosovo. He is a graduate of the U.S. Army Command and General Staff College (CGSC). His most recent operational military experience was as a civilian serving in the AFRICOM combatant command as a joint logistics planner for NATO operations in Libya.

Malcolm is a published author in military professional periodicals, civilian peer-reviewed, and civilian non-peer reviewed forums such as the U.S. Army's *Sustainment Magazine*, *American Journal of Disaster Management, Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, Homeland Security Affairs, and Professional Issues in Criminal Justice.* He has authored and co-authored several book chapters on topics ranging from food safety, contracting, and national defense industrial base. He has also presented papers at the Homeland Defense and Security Education (HSDCA) summit and American Association of Adult and Continuing Education (AAACE) conference.

Appendix J - Researcher Expertise Summary
JON H. MOILANEN

Jon H. Moilanen is an adult educator. He is currently a senior military analyst, researcher, and writer in support of U.S. Army training and doctrine for leader development, threats awareness and intelligence support, and Army leader and unit readiness. He authors and contributes to a wide-range of training and educational products to include Joint Chiefs of Staff (JCS) U.S. Department of Defense joint publications, and Army training doctrine field manuals, training circulars, operational topic handbooks, strategic whitepapers, Army officer and noncommissioned officer educational courseware, train-the-trainer courseware, and special topics of interest.

His experiences include teaching in the academic classroom at the civilian university undergraduate level and military college graduate level. These professional learning opportunities span over three decades, interspersed with years of practical experience in the field and institutional environments of the U.S. Army. His graduate degree in counselor education is from Indiana University of Pennsylvania. He is a graduate from the University of Wisconsin-Oshkosh as a Distinguished Military Graduate (DMG) and earned an undergraduate degree in education.

He served for 30 years as a commissioned officer in the active component of the U.S. Army and retired as a colonel (USA Retired). He commanded U.S. Army units at group, battalion, and troop levels in the continental United States and in a duty station abroad. He is a graduate of the U.S. Army Command and General Staff College (CGSC), U.S. Army Logistics Executive Development Course (LEDC), and U.S. Army War College (AWC). In addition to his command or staff assignments in squadron, battalion, brigade, regiment, and corps units and headquarters, he has been a tactics and logistics instructor, history instructor, and senior instructor. Senior academic positions have included Director of an Army and joint forces warfighting leadership experiment and command post exercise using constructive simulations at CGSC; Chief of Staff for an Army-wide leadership study in training, leadership, and Soldiers (TLS); Director of the Army's School for Command Preparation that orients officers selected to be Army battalion and brigade level commanders, provides tactical decisionmaking training, and presents command team seminars to improve commander and spouse teaming during a tour of

command; and as his final military duty prior to retirement from active duty, Dean of Students and Administration at the U.S. Army Command and General Staff College.

Jon is a published author, illustrator, and contributor in military periodicals and professional forums such as Joint Publication 3-26, *Counterterrorism*; U.S. Joint Chiefs of Staff J34 antiterrorism journal, *The Guardian*; U.S. Army Field Manual 3-37.2 *Antiterrorism*; *The Sentry* published by Headquarters, Department of the Army G3/5/7 as an official newsletter; the U.S. Army's professional journal of the Combined Arms Center *Military Review,* and various Army functional branch periodicals of *Army Logistician* [now titled *Army Sustainment*], *Infantry, Armor, Aviation Digest, Army Chemical Review;* and the National Defense University's *Essays on Strategy XIII*. On behalf of U.S. Army TRADOC G2 Intelligence Support Activity (TRISA), he publishes a monthly information bulletin, *Threats Terrorism Team Advisory*, and a monthly *War on Terror* poster series as well as special poster-bulletins.

He has presented Army doctrinal and education-training support programs at expositions, conferences, or special meetings for a U.S. Armed Forces Component Command (COCOM); Army Service Component Command (ASCC); Headquarters, Department of the Army (HQDA); and the Army's Training and Doctrine Command (TRADOC). Some of these education and training support programs and material are used also by the U.S. Air Force, Navy, and Marine Corps. He presented preliminary doctoral research at an annual conclave of the Adult Education Research Conference (AERC) and several annual conferences of the American Association for Adult and Continuing Education (AAACE).

Appendix K - Perception Cues to Pattern Recognition

The photograph in this appendix is the subsequent interpretation of a natural looking woodland scene as presented in Figure 4.1. The trees and underbrush were unremarkable in a natural setting. Upon closer scrutiny, several wood posts appeared to be driven into the ground along a line through the woods. Other perceptions of something amiss were nil.

When a verbal prompt was provided to look for a sniper somewhere in the scene of Figure 4.1., the *conditions* of the environment changed. With this new perspective, the conditions of the woodland setting acquired a new search for meaning. Camouflage was now expected.

Cues to visual patterns of what may be present were perceived differently. Some cue or cues may prompt a new paradigm. In the photograph below, the meaning-making emerged as the figure of an individual camouflaged, crouched, and looking at the observer through a telescope.

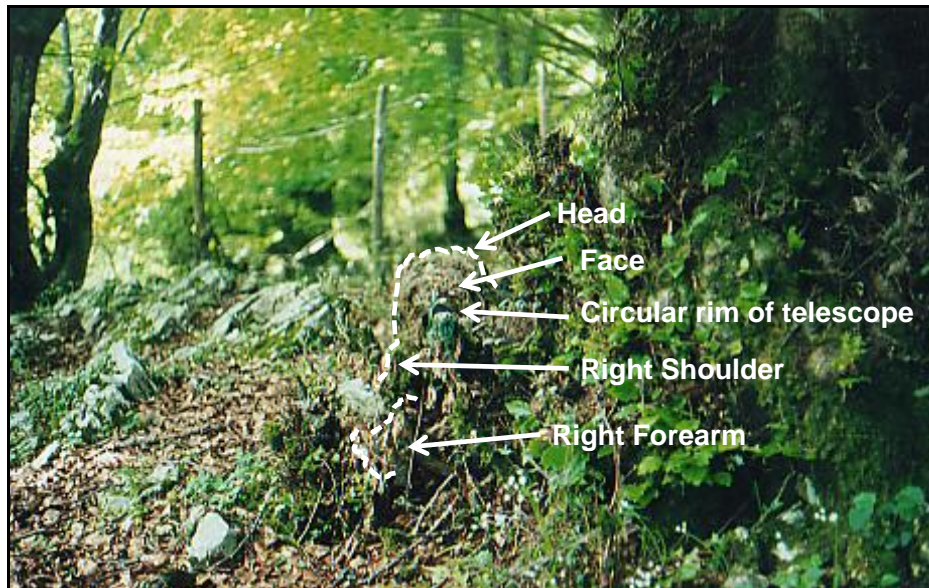**Figure K.1 Implicit Cues, Intuition, and Pattern Recognition**

Figure K.1. Camouflage was selected for this demonstration as a concept familiar to the military domain of expertise, and yet; the levels of awareness and understanding of a particular environment may be implicit cues that trigger physical sensing or cognitive apprehension. The perception of such cues may recognize similarities or patterns, and emerge as explicit recognition of a pattern or other practical meaning. As adapted from "The Science of Digital Camouflage" at
 http://www.defence.pk/forums/military-forum/122076-science-digital-camouflage-design.html

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