Engagement Decision Matrix:
A model of cognitive dominance for the infantry squad

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NOVEMBER 2016

Abstract

This study sought to explore and describe squad leader decision-making experiences within the framework of battle engagement – including those last moments leading up to the engagement. We employed interpretive phenomenological analysis in a tradition of qualitative research using focus group discussion with four participants purposively selected on a basis of homogeneous qualifications as military veterans, experienced squad leaders, and instructors of tactical doctrine.

The impetus of this work stems from recent studies conducted by one of our authors and by the United States Army, most prominently the Program Executive Office of Simulation, Training, and Instrumentation under the Training and Doctrine Command. In each of these studies, researchers identified a dearth of cognitive models for decision-making at the level of squad leadership. Poor battlefield performance of US Infantry dismounted squads has been attributed to a deficit of models that might afford cognitive dominance.

Our research discovered four emergent themes: (1) a perceived lack of authority for flexible decision-making; (2) a lack of transferability of existing cognitive models; (3) factors of consideration squad leaders contemplate prior to and during battle engagement; and (4) factor sequencing of considerations prior to and during battle engagement. Our effort to describe squad leader experiences presented an opportunity to codify a new cognitive model of decision-making that we named the Engagement Decision Matrix or EDM. Unlike earlier models that typically resulted in binary fight-or-flight outcomes, the EDM prompts squad leaders with four questions to arrive at five possible outcomes – bypass, hasty attack, supported attack, defend, or withdraw.

Keywords: Cognitive Dominance, Cognitive Model, Decision-Making, Infantry Squad Leader, Qualitative Methods, Interpretive Phenomenological Analysis.

I. INTRODUCTION

The United States Army concedes it is struggling to identify cognitive models to improve the performance of individual Soldiers, specifically for squad leaders engaged in the high-stakes time-pressured decision-making of the battlefield (Mundweil, 2013; PEO STRI, 2014).

With the drawing down phase of the wars in Southwest Asia, professionals in the Army have asserted that the performance of Infantry rifle squads have not improved since the onset of the Second World War, circa 1940 (Brown, 2011). That assertion prompts a speculative question: With all of our technical advances over the past 75 years, why don't Infantry rifle squads achieve a decisive overmatch in battle against enemy squads? To answer this question,

the Army conducted the Squad Overmatch Study through the Program Executive Office of Simulation, Training, and Instrumentation (PEO STRI), who recommended three attributes for enhancement: technology, squad structure, and human dimensions (2014).

The Army is currently seeking solutions to squad technological attributes through the Squad Foundations of the Decisive Force (SFDF) initiative at Fort Benning, Georgia (2014). The idea is that battlefield operating systems organic to the Infantry squad may be improved to better enhance intra-squad communications through global positioning satellite interfaced with squad targeting systems that connect to assets of higher echelons at the battalion or brigade level, mainly field artillery and close air support targeting systems.

The Army has decided to postpone the perineal question of the rifle squad's force structure until a later date, presumably after the technology question has been satisfied. Instead, the SFDF initiative intends to primarily focus on technological solutions for the Infantry squad (2014). The Army's reluctance to restructure the Infantry squad may be understood in light of the considerable attention accorded to this effort since the 1940s with remarkably little gain.

What remains unaddressed is the squad attribute of human dimensions (Mundweil, 2013). So, what does this term mean? The Army nebulously defines human dimensions as "cognitive, physical, and social components of Soldier…leader, and organizational development and performance essential to raise, prepare, and employ the Army in unified land operations" (TRADOC Pam 525-3-7, 2014). Mundweil's description of human dimensions is only slightly less vague, stated as "conditions that members of a team develop, which increases the capability of the formation" (2013).

PEO STRI more concisely describes human dimensions as including an array of considerations – leader situational awareness, communicative process, and collaborative

teamwork (2014). Yet the PEO STRI study focused on what squad leaders *perceive*, while offering no cognitive models of how squad members should *think*. While Mundweil identified cognitive skills as a critical component of human dimensions, he notes that models enabling cognitive dominance of the Infantry squad are starkly absent from past work. "Missing from all these studies was an attempt to develop capability based on improving cognitive skills of the individuals who make up the squad, or to increase capacity through enhanced training of the human dimension" (2013, p.18).

We refine the term "human dimensions" to include cognitive models of decision-making, which are predicated on situational awareness, with the intent to enhance performance of the squad's communicative processes and collaborative teamwork.

Simultaneously and quite unaware that the Army was struggling to identify a model of cognitive dominance for Infantry squads, Larsen was conducting research on cognitive apprenticeships at a leadership institute in the American Midwest (2015). As early as 2012, Jackson noted that a previously codified cognitive model called the Battle Drill Matrix (Larsen & Wade, 2013), then taught at the leadership institute, was woefully inadequate for most tactical situations because it left too little flexibility in options. Jackson's insistence was vindicated a couple years later through Larsen's research findings, and then again through the findings of the Army's PEO STRI Squad Overmatch Study (2014).

Contextually prescriptive cognitive models do exist within the Army. Battle drills matured with the onset of the wars in Southwest Asia as a result of the Army's heavy reliance on decentralized lowest level control of operations. The Army implemented prescriptive battle drill as a means of the commander to exert a measure of control of battle engagements with enemy forces, even in the commander's absence. This situation prompted a collaborative effort by all

four branches of the US Armed Forces to produce a field manual on convoy operations. FM 4-01.45 Tactical Convoy Operations (2005, Fig. III-22) recognizes a rudimentary decision matrix for executing battle drills during convoy operations; as does FM 3-21.8 The Infantry Rifle Platoon and Squad (2007, Appendix J) in the section discussing the implementation and selection of battle drills.

Clearly the Army endorses the concept of a decision-making matrixes for battle, even if the Battle Drill Matrix (BDM) has not been officially recognized by the US Army. The Army certainly uses similar cognitive tools for decision-making, and some form of the BDM has been implemented at least since the mid-1980s (Larsen, 1998; Larsen, 2008).

Official recognition notwithstanding, past cognitive models of battle drill selection have invariably fostered a normative practice of engagement-through-attack for the infantry squad (FM 3-21.8, 2007). The BDM illustrates exactly that. Upon contact with an enemy force, the BDM prompts the combat leader with a series of sequential questions (Larsen & Wade, 2013):

1. Can my squad defeat the proximate enemy force? If yes, attack. If not…
2. Can my squad defeat the proximate enemy force with help? If yes, gain help. Attack.
3. If not, can we defend? If yes, defend. If not, withdraw.

Motivated by both the Army SFDF initiative on human dimensions and Larsen's past work on cognitive models of pedagogy, we conducted qualitative research through interpretive phenomenological analysis in the spring of 2015. Our goal was to describe the tacit cognitive process inherent of squad leaders making decisions prior to and during battle engagements.

Research Question

The goal of this research was to describe the tacit cognitive process of successful squad leaders making decisions during battle engagements. Although not the original intent of this study, we

were subsequently presented with an opportunity to codify a cognitive model of that tacit process. The central research question was, "How do squad leaders describe the experience of making decisions to engage enemy in battle?"

The subordinate research questions were:

1. What concerns do squad leaders express with current models of decision-making?
2. What factors do squad leaders consider when making decisions during battle?

To answer these research questions, we opted to explore this decision-making experience via qualitative research using a method of interpretive phenomenological analysis to describe the lived experience of squad leaders who bear the responsibility of making decisions during or immediately prior to battle engagements. The research team undertook this effort with the understanding that each squad leader's experience might be too unique to describe commonality between various applications of successful decision-making, but the challenge was intriguing.

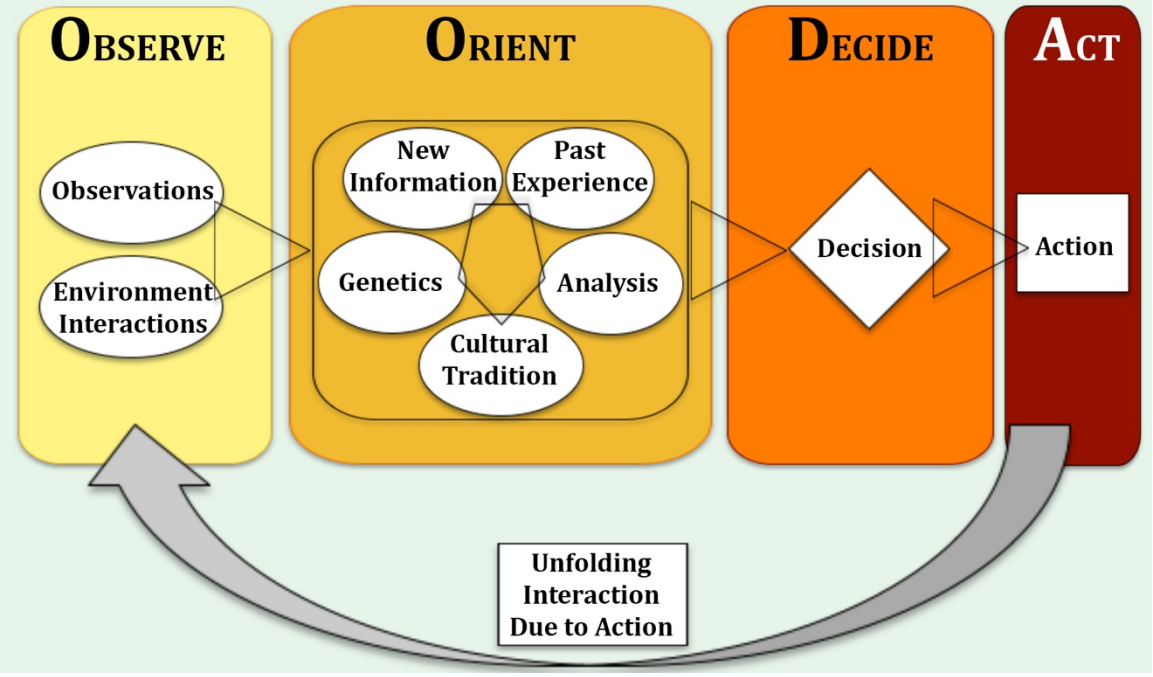
II. LITERATURE REVIEW

Cognitive models have a long history within the US Armed Forces. In the 1960s US Air Force Colonel Boyd developed a decision-making cycle by which people flow through a reiterative process of observe, orient, decide, and act. This became known as the OODA Loop in military vernacular (Boyd, 1996), albeit formal recognition from the Air Force entailed 30 years.

Boyd had flown only a limited number of missions in F-86 Saber jets against North Korean Mig-15 jet aircraft in the early 1950s, yet his keen reflection on the cognitive processes of fighter pilots offered critical insight into human cognition (Hammond, 2001). Today all branches of the US Armed Forces instruct the principles of OODA for the purpose of operational

warfighting. The OODA Loop has been widely accepted in sports, business, law, and emergency services.

Figure 1: *Boyd's OODA Loop Cognitive Model (1996)*



In the most convenient terms, the complex OODA Loop can be simplified as:

1. Observe environmental stimuli – circumstance or directive that prompts attention.
2. Orient upon one or more course of action (COA) to address stimuli.
3. Decide on COA, basing selection on implicit outcome.
4. Act on selected COA.
5. Loop back to the "Observer" step of process, watching for interaction with stimuli.

Contemporary to Boyd's model, Klein's influential work in models of intuitive decision-making expressed in *Sources of Power* (1998), established two vital concepts regarding how humans make decisions. Firstly, Klein put into question previous assertions that humans as a matter of habit consider multiple alternate COA prior to making decisions. Secondly, Klein

established a unique cognitive model of high-stake, time-pressure decisions through a process of recognition priming.

Working with fire departments in the 1980s, Klein's research proposed a concept of naturalistic decision-making whereby decisions formed from the memories of one's own experience. Using earlier models of decision-making that insisted agents generate multiple COA and then weigh each COA for the likeliness of a best outcome, Klein predicted that fire captains would generate just two "most likely" COA to compare. This small number would reduce the cognitive load of the fire captain as he prepared for the dangerous task.

However, Klein soon discovered that fire captains rarely considered any COA on their way to a fire – none at all. Instead, fire captains only decided what needed to be done once they had visual contact with the incident and could gain situational awareness.

One fire captain commented to the effect that he never recalled making a decision in his career. Instead, he described the decision-making as simply a flow of understanding the situation and intuitively knowing what needed to happen next. That makes perfect sense given that fire departments are meritocracies by which fire captains are promoted from the ranks of experienced fire personnel with a great deal of experience learnt over the years.

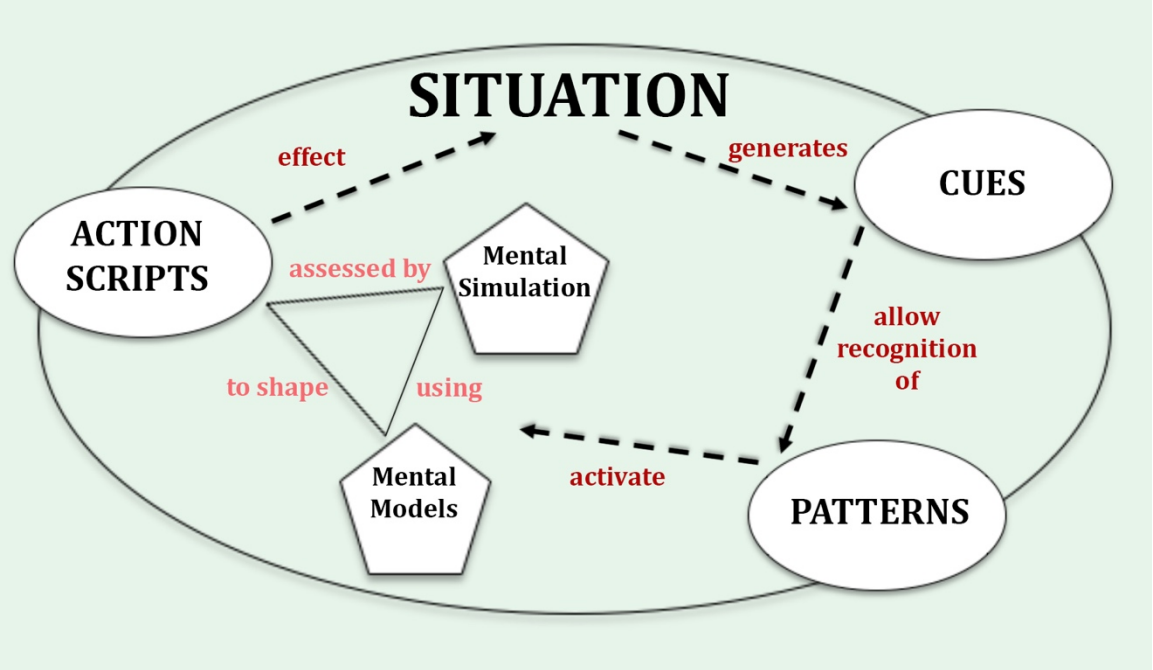
This was a significant breakthrough for Klein's research. It meant that at least for high-stake, time-pressure decisions only one COA was considered, and even then it was considered only after the fire captain had gained situational awareness. Equally as important, the COA developed from within the fire captain's personal set of experiences. That is, recognition of the situation at had primed the fire captain's decision (1998).

Recognition primed decisions (RPD) contradict earlier models of decision-making, again at least for the sake of high-stake, time-pressured decisions that are unilaterally selected by a

single agent or actor. Multiple COA are not considered and compared in advance of the engagement. Only one COA is offered, and even then only once a semblance of situational awareness is obtained through interaction with the engagement (Klein, 1998).

Equally as critical is that the COA considered comes from the tacit knowledge of the leader's personal experiences. Klein later confirmed the RPD model with military personnel, emergency room staff, poker players, and stock market investors. More to the point, Klein's findings vindicated the U.S. Army Research Institute's claim that military commander's were not employing the sanctioned decision-making models put forth in the 1970s because these models were cumbersome and inauthentic (1998). Klein's RPD model further bolstered Boyd's OODA Loop model by offering greater insight into the decision-making stage of Boyd's model.

Figure 2: *Klein's RPD Cognitive Model (1998)*



Regarding the issue of human dimensions, specifically insufficient cognitive models of decision-making for squad leaders (PEO STRI, 2014), our research team selected interpretative phenomenological analysis (IPA) as a method because of its ability to offer insights into how

people make sense of a given phenomenon within a given context. IPA is a research method most often used in the field of health psychology due to increased interest in how symptoms are perceived by those patients affected with various mental illnesses (Smith, 1996). While the field of health psychology saw a general increase in the number of IPA studies published since the turn of the 21st century (Smith, 2011), it was also during this time that IPA also started to be used in other disciplines of research including entrepreneurial business studies (Berglund, 2007; Cope, 2005; Seymour, 2006).

Due to the experiential similarities of entrepreneurial leadership and military leadership (Avrahami & Lerner, 2003; Yardley & Neal, 2007; Mani, 2007) and the compulsion of the IPA methodology to producing a faithful and granular interpretative account that is grounded in each participant's individually lived experiences (Smith & Osborn, 2008), the research team valued the IPA method as appropriate to attend the research questions of this study.

III. METHODOLOGY

This study draws on the principles of Interpretative Phenomenological Analysis (IPA) developed by Smith and colleagues (c.f. Smith et al., 1999; Smith & Osborn, 2008) to inform both research design and analysis. We chose to employ a focus group discussion through open-ended semi-structured interview questions via email correspondence, rather than interviews with directed questions (Smith & Osborn, 2008). The rationale was to capture detailed transcripts of participant descriptions while collaborating with participants toward meaningful insight. For this reason, four participants were selected through purposive and homogenous sampling, which is normative practice for an IPA study (Reid, Flowers & Larkin, 2005). The intent of this sampling was to obtain participants who have experiences in common, and who have demonstrated

appreciable success, and failure, within decision-making competency as squad leaders engaged in either authentically simulated and/or actual battlefield engagements.

Table 1. *Description of Four Participants and Two Facilitating Researchers*

Larsen (first author): A veteran of the US Army Infantry as a non-commissioned officer with nine years of service and deployments to the Korean Demilitarized Zone and Operation Iraqi Freedom; instructor of tactical doctrine for 20 years.
Jackson (third author): Currently serves in the US Army Infantry as a non-commissioned officer with three years of service in Italy and deployments to Ukraine and Estonia; instructor of tactical doctrine for 5 years.
Nate (pseudonym): Currently serves in the US Army National Guard Infantry as a non-commissioned officer with a couple of years of service in the American Midwest; instructor of tactical doctrine for 2 years.
Sage (pseudonym): Currently serves in the US Army Combat Engineers as a non-commissioned officer with six years of service and deployment to Operation Enduring Freedom in Southwest Asia; instructor of tactical doctrine for 4 years.
Johan (pseudonym): A veteran of the US Army National Guard Military Intelligence as a non-commissioned officer with six years of service and deployment to Bosnia; instructor of tactical doctrine for 10 years.
Daniel (pseudonym): Currently serves in the US Marine Corps Military Intelligence as an officer with three years of service and studies conducted in central Africa; instructor of tactical doctrine for 5 years.

Table 1 descriptions of the four participants and two facilitating researchers purposively include four actively serving squad leaders and two veteran squad leaders, comprising of five Army NCO and one Marine Officer. Three are Infantrymen, one is a Combat Engineer, and two are Military Intelligence analysts. All but one of the participants have deployed to theaters of conflict, and all four participants had extensive tactical training inside and outside of the US Armed Forces. The four participants, and indeed both researchers, had instructor experience within their military unit and within the leadership institute from which they all graduated, thus

confirming purposive homogenous sampling of four participants and two facilitating researchers, all with commonly shared contextual experiences (Greening et al., 1996).

The semi structured interview started with the following question: (1) "What concerns do you have with current models of decision-making for encounters with the enemy on the battlefield?" This initial question was subsequently followed up during the three-day email correspondence with a second question: (2) "What factors do you consider when making decisions as you encounter the enemy on the battlefield?" Although not planned as a question for group discussion, a third question arose out of nascent opportunity: (3) "How do you reconcile the aforementioned problems of current cognitive models with decision-making prior to and during battle engagements?"

Data Analysis

Our data analysis method as detailed in Table 2 is not a prescriptive methodology, but rather it allows for individuality and flexibility of approach to data analysis (Smith & Eatough, 2006). This is not to say IPA is not systematic in its procedures, but rather while "there is a basic process to IPA (moving from the descriptive to the interpretative), the method does not claim objectivity through the use of a detailed, formulaic procedure" (Brocki & Waerden, 2006, p. 97). To be sure, recently scholars challenge the feasibility of conducting qualitative research without preconceptions or bias, and underscore the ethical requirement of disclosing how the researcher's interpretations and meanings have shaped findings, as well as the demand for transparency that makes the researcher visible as an interested and subjective actor in the activity of the research, rather than misrepresenting the researcher as an impartial observer (Plummer 1983).

Drawing on and adapting the principles of IPA developed by Smith and colleagues (1999) together with Hycner's (1985) work on the phenomenological analysis of interview data,

different levels of analysis and interpretation were applied to the semi-structured interview discussion. IPA is at its core inductive and idiographic, demanding a detailed, nuanced analysis of the data (Smith, 2004).

While Giorgi (2011) argued that interpretative phenomenological analysis (IPA) provides no step in executing bracketing, bracketing is a methodological technique that is typically used in phenomenological studies requiring the researcher to deliberately put aside one's own belief about the phenomenon under investigation prior to and throughout the phenomenological investigation (Carpenter, 2007). Due to the unique and intimate positionality for two of the researchers conducting this study, Larsen and Jackson, the research team determined that bracketing would be ethically necessary and beneficial as it provided a measure of validation.

Thus, Lowrance was employed as the arbitrator for data analysis as an effort to validate analysis conducted by Larsen and Jackson, who were both immersed deeply in the focus group discussion and daily analysis as facilitators. Indeed, both Larsen and Jackson met the purposive and homogeneous criteria of the four participants – and we believe this intimate positionality of Larsen and Jackson to the participating squad leaders afforded a nuanced appreciation of described experiences. However, Lowrance was only able to access the data after collection had been completed. In this manner, Lowrance was able to put aside much of his repertoire of knowledge, beliefs, values, and experiences by first listing his assumptions of what the semi structured interview would produce and providing his own answers to the research questions.

It is acknowledged in the phenomenological approach that pre-understanding cannot be completely eliminated or bracketed (Koch, 1995), and that was certainly the case for Larsen and Jackson, who were deeply involved in directing and redirecting the discussion between the four participants of this study. Yet with Lowrance as the arbitrating researcher, separate from the

interviewing process and field notes that directed and redirected the focus group discussion, bracketing was employed as much a possible throughout the data analysis stage of this study.

Table 2. *IPA Levels of Data Analysis*

Familiarize & Gain Insight	**Reading of the Case**	Multiple readings of the transcribed discussion helped gain an appreciation of the whole story, to recall the interview in both a cognitive and affective sense, thereby gaining intimacy to represent each participant's account (Senior et al., 2002).
Immerse & Sense-making	**Diagnosis of the Case**	A free textual analysis (Smith and Osborn, 2008) was used to highlight potentially significant excerpts of the discussion. Units of meaning were identified and then grouped to form common clusters of meaning (Hycner, 1985).
Categories	**Developing Intra-Case Themes**	Stage 1 reflective analysis was linked to Stage 2 clusters of meaning to form emergence of themes that appeared salient to the research questions. The process of clustering units of relevant meaning (Hycner, 1985) led to the Stage 3 master theme list (Smith et al., 1999) of the discussion transcript.
Associate & Pattern Recognition	**Developing Inter-Case Themes**	A meta-level analysis was conducted. The master theme list was used to identify and explain similarities and differences of participant perspectives, thereby creating links between accounts (Easterby-Smith et al., 2002) through shared aspects of experience to create aggregated themes from across the accounts (Smith et al., 1999). This included both general and unique themes found through the discussion (Hycner, 1985).
Interpret & Represent	**Writing Up**	A narrative was developed to portray the interplay between the researchers and participant descriptions of experiences in their own words (Smith & Eatough, 2006). An inductive approach to findings was written from data without the influence of academic literature, with the intent to allow data to faithfully speak for participant experiences (Cope, 2005).
Explain & Abstraction	**Enfolding Literature**	During the analytical discussion of data, the theory-building process of 'enfolding literature' was conducted, requiring a theoretical explanation of the findings (Eisenhardt, 1989).

IV. FINDINGS

In April 2015, the research team discussed common findings of two recent studies, the PEO STRI Overmatch study (2014) and Larsen's study on leadership cognitive apprenticeship (2015). Common to both studies was that new squad leaders expressed frustration with cognitive models of decision-making, or a lack of cognitive models. For the researchers, this deficiency presented a favorable moment in time to explore the experience of squad leader decision-making through qualitative description. Four participants were recruited, and in May of 2015 the focus group began an email conversation with a stated assumption and a question, "Okay, we all appear to agree that the Battle Drill Matrix is inadequate. But what exactly about the cognitive model is broken? And how do we fix it?" (Focus Group, Tuesday, 9:00 AM.)

Four themes emerged over the course of the three-day focus group discussion: (1) a perceived lack of authority within existing cognitive models necessary for flexible decision-making; (2) a lack of situational transferability of existing cognitive models; (3) factors of consideration each squad leader contemplates prior to and during a battle engagement; as well as (4) sequencing of factor consideration prior to and during battle engagement.

4.1 Theme: Lack of Flexible Decision-Making Authority

Jackson offered that he believed the BDM, specifically, was predicated on the offensive tactic of hasty attack. As evidence, he cited the first question of the BDM, "Can we defeat them?" Jackson noted that if the squad leader answers positively to this prompt, then the BDM next instructs the squad leader to immediately order an attack. Jackson asked the discussion group whether it might be more accurate to describe squad leader decision-making as focused on the scope of the mission, Commander's Intent, and/or Rules of Engagement (ROE) at or near the beginning of the BDM. (Focus Group, Tuesday, 9:31 AM.)

The discussion then went quiet for almost five hours. During that pregnant silence, it felt as if the discussion facilitators might have played their hand too strongly. Or, the delayed response could have been an expected result of an email chain discussion that began in middle of a work week. It also might simply reflect the personalities of the participants within the focus group. Whereas Larsen and Jackson enjoy aggressive discussion from which to pitch ideas to see if they'll stand; Nate, Sage, Johan, and Daniel are generally more reserved. They prefer to listen to a discussion for a while and absorb the different positions before weighing in with their own perspectives. (Researcher notes, May 19, 2015.)

Johan weighed in that afternoon from Pennsylvania:

> I well remember the earlier discussions where Jackson was questioning this hole in the BDM. At the time my thought was that there is a fourth component in there somewhere. The new question – let's call it BDMQ4 – is relevant, but I don't know that it belongs at the top of the BDM.
>
> While having BDMQ4 at the very top does simplify the model, I feel that it takes away some decision-making freedom away from the leader out in the field. My thinking is this: *auftragstaktik* is the idea that commanders should give their subordinates general directions concerning what must be done. Leaders determine how things get done. During preparation leaders pick routes, decide how to use resources, how and when to communicate. The magic in *auftragstaktik* comes about via mutual trust between command and subordinate leaders, and in application of explicit battle drill training. (Focus Group, Tuesday, 2:26 PM.)

Johan then relates a training experience in which a Signal communication unit was tasked to establish a radio relay site on a specified hilltop. During their execution of that mission, the squad leader spotted an enemy patrol. Johan stated that this situation put that squad leader in

what he described as an "interesting dilemma." He asked the discussion group if the squad leader should continue on his mission and assume the risks of placing critical friendly assets within striking distance of an enemy force? Or might the squad leader violate his orders and engage the enemy to eliminate the threat? (Focus Group, Tuesday, 2:26 PM.)

> I now invoke another German tactical term - *innere führung,* the ethical commitment of Soldiers on the field of battle. Leaders and Soldiers DO need to follow rules and their orders. They also need to practice good force protection, and engage targets of opportunity where it will do their side good. My thought is that the leader here is already applying BDM using the classic model, and BDMQ4 is now a distraction. What if the leader uses the classic BDM, does a quick assessment, applies BDMQ4 as the very last question, then calls to higher (command) with developed and actionable information?
>
> One would hope that during TLPs (troop leader processes) that leaders and subordinates have already dealt with contingencies such as, "What if we make contact?" That's a different discussion, though.
>
> I'm a fan of BDMQ4 as an augmentation of BDM. Where the heck should it go, though? Thoughts? Happy to hear from any and all. (Focus Group, Tuesday, 2:26 PM.)

Larsen wrote back an hour later:

> Johan, I think you've asked a salient question – one that I've been weighing as well, but in other angles of consideration. Nonetheless, it seems we're running parallel questions.
>
> Question: For the Battle Drill Matrix, shouldn't the output be an expressed battle drill? Answer: No. If this were called a "Battle Drill Calculator" then yes – input factors, output specified battle drill. But this is a matrix, not a calculator.
>
> In the 1950s COL John Boyd (USAF) codified another matrix that we today call the

OODA Loop. It, too, was initially rejected by the Air Force, but was later picked up and instituted by all branches of the US Armed Forces as a decision-making model. Yet OODA doesn't have an output, either. It does not tell the pilot what to do, or even what his options are! Instead, OODA simply codifies a decision-making model.

Let me suggest that essentially BDM does the same. It is a decision-making model that elucidates clear options. In short, BDM does not remove any options from the (squad leader). Because it removes no options, it does not in anyway impair, restrict, or even constrict *auftragstaktik*. Yes? (Focus Group, Tuesday, 3:30 PM.)

Within minutes Sage responded from Kansas. He relays an experience he had while conducting route clearance for landmines and improvised explosive devices (IED) as a squad leader while deployed to Southwest Asia. In that incident, Sage's squad spotted an enemy patrol just beyond the range of their small arm weaponry. As a Combat Engineer his primary mission was route clearing, not chasing enemy patrols. Yet that enemy patrol presented a measure of danger to his squad, and therefore it presented risk to his mission. Sage explained that in this particular case he recognized that implementation of the BDM would not be appropriate, so he modified it.

An example of where this works very well is a mission that requires assets to be maintained on task, even if it makes sense in some other way to pursue the enemy to destruction. This additional question, at the beginning, would fit perfectly into our thought making process. For example, we have on occasion driven through far ambush fires and not made any serious attempt to pursue or attack the enemy. Instead continuing to sweep the road, while letting our supporting infantry platoon chase the enemy.

Without solidifying it into a teachable form, I have been making this fourth decision for years. Now, that said, the first thought that goes through my head in a fight is, "Can I take

them?" This is true…and the reason for me is clear. If the answer is no, then the rest of the matrix needs to be processed as quickly as possible. Because the likely outcome is to defend or withdraw. If the answer is yes, then I need to ask, "Is it within the scope of my mission?"

Nuance you say? Probably. In reality, our brains process these decisions in divergent ways that seem simultaneous, rather than linear. So having a simple written and graphical method is probably best. For the moment this seems like a true addition to the BDM. 'Definitely in need of more thought and research to prove it's true out there the dirt. (Focus Group, Tuesday, 4:10 PM.)

Here the participants seemed to have quickly come to a consensus that the identified gap in the decision-making model was the Army's insistence of attack as the default tactic. The insistence on attack was perceived by the participating squad leaders as limiting their authority to make decisions beyond fight-or-flight outcomes. Johan, Sage, and Jackson all described experiences of frequently having to modify existing cognitive models during battle engagements with enemy forces. Still, for reasons of self preservation, these participants also expressed reluctance to forfeit the option of attacking the enemy, preemptively. (Researcher notes, May 19, 2015.)

4.2 Theme: Lack of Situational Transferability

Sage posed a new question. "Is it completely universal? The OODA Loop for example is true for almost any decision, from how many steaks to cook for dinner to jet powered air combat." Sage asked the group if the BDM was universal to industries outside the military, or even within decision-making amongst various military disciplines? (Focus Group, Tuesday, 4:10 PM.)

Sage's question created a dialogue regarding universal transfer of the cognitive model that would be repeatedly raised over the entirety of the three-day focus group discussion. In general, participants seemed to agree that with a bit of tweaking a cognitive model useful for

making decisions on the battlefield might be relevant to other human endeavors. Yet because Larsen and Jackson believed this speculative conversation to be outside the scope of the study, the topic would be tolerated for a short while, and Jackson or Larsen would attempt to redirect the focus group back toward the research question. (Researcher notes, May 21, 2015.)

Larsen wrapped up the first day's discussion late that evening:

> (As to) the question of transferability, or universality of the BDM, I can see some potential for transfer. But the universality of the OODA Loop was established after Boyd championed it as a tool to teach pilots how to dogfight. In short, the BDM may have other applications or it may not, but that status does not dictate its utility for the squad leader. If it gives our squads an advantage, it's worth every penny. Yeah? (Focus Group, Tuesday, 10:39 PM.)

Larsen began the discussion again early the next morning. The group's persistence in doggedly pursuing the issue of transferability of the BDM to other disciplines and endeavors had kept him up late the night before. After some deliberation, Larsen decided that perhaps there was some merit to this sideshow. He had hoped the focus group would discuss problems with existing cognitive models, but maybe the participants were doing exactly that. Maybe he and Jackson weren't appreciating this particular discussion as pertinent to the question at hand. So Larsen decided to change tactics by asking the question another way: (Researcher notes, May 20, 2015.)

> I believe it might be the best to change the name of the BDM. I can think of two reasons to do so. First, changing the name might avoid any confusion.
>
> The second reason for a name change plays into Sage's discussion on transferability. Is this model really just for patrolling operations? The answer to that question isn't for us to decide. It is usable to others, or it is not. But if we think of it in terms of broader use, we have good cause to further simplify the questions. (Focus Group, Wednesday, 9:00 AM.)

Larsen then proposed adding a single question, “Is this task mine?” to the new model. This question added the option of a tactical bypass to the decision-making, thereby making the cognitive model more applicable – or transferable – to a greater number of tactical conditions.

> Written this way, the model runs much deeper with meaning. I’ll argue it’s relative to Soldiers in patrolling tactics, personnel in firefighting, lawyers in court, business, politics, and gamblers in games of chance. All of these endeavors involve high-stake critical decision-making. This is a model of how we think of those decision. In this way it seems that removing the words "Battle Drill" from the moniker readily implies some transferability. (Focus Group, Wednesday, 9:00 AM.)

Johan responded favorably that morning, “I like the idea of renaming the model. How about ‘Engagement Decision Matrix’ (EDM)?” He insisted the name should immediately bring to mind what the model does for the user. In this case, Johan suggested that the purpose of the tool was to decide whether or not to engage an opponent in battle, similar in concept to triage of patients in a hospital emergency room. (Focus Group, Wednesday,11:08 AM.)

Larsen liked this idea, as well as the acronym Johan had suggested. “So it’s called EDM – as in pronounced ‘*idiom*’ like idiomatic? Ha! That’s too cool. I like this on so many levels.” (Focus Group, Wednesday, 11:51 AM.)

Daniel offered a response from Virginia. He agreed with Johan’s naming convention and rationale, and noted that while the name might appear to be putting the cart before the horse, in this case it was the rationale behind the naming convention that resonated with him, and served as a converging focus for a new model. (Researcher notes, May 20, 2015.)

Daniel’s point seemed to be evidenced by the participants rallying around the name so quickly and unanimously. It seemed now that the whole group had agreed on the name of the

model, and Johan's naming rationale resonated with the focus group. In so doing, it may have satisfied the perceived need for situational transferability. (Researcher notes, May 20, 2015.)

Johan then pondered the responses from the group by occupational specialty. He noted participants appeared to move toward consensus firstly along the lines of Infantry, Combat Engineer, and Military Intelligence. Johan proposed that only then did our group move collectively toward a consensus:

> I can't help but notice that there seems to be a difference in how people within a given discipline answered the issue at hand, initially. The people with Intel background seemed to answer with a common theme. Infantry respondents answered with a common theme. Sage, from the perspective of the Combat Engineer answered differently, as well.
>
> We all seem to be on the same page, now, after considering things for a bit. Is it worthwhile to research the input from still more disciplines? Doesn't have to be military, per se. Just wondering how others see this, and if one's personal background has any effect on their initial response. I'm also wondering about scope. Do responses change when a problem is considered from a tactical vs. strategic perspective? Does echelon matter? Do opinions diverge based on squad-level, company-level, corps-level decision making? (Focus Group, Thursday, 12:02 PM.)

Jackson offered the final word on this issue on day three of the discussion:

> I think this topic has a potential to get pulled away from solving a small unit tactical problem. I'm not saying that the EDM can't have applications outside of combat operations, but this is the discussion at hand. Getting corporate perspectives right now may be too much mission creep at this time. (We are) specifically solving a gap in the BDM.
>
> I see this as a philosophic shift back to *auftragstaktik* as the central mode. The EDM can

enable this. *Auftragstaktik* was so wildly successful in both world wars, but was not adopted in its totality. It is effectively dead when leaders are not allowed to seek a tactical bypass or withdrawal options to survive and continue the fight.

I am interested on how the echelons view this because I see the same gap at all levels of command. I see a lot of the same philosophy at the company level. Recently we had a squad leader in our platoon reprimanded for showing precisely this sort of brilliant initiative during lane training. He now works in our battalion staff as his "reward."

(Training evaluators) made it clear that the default option is to "always attack" upon chance contact with the enemy. This mindset is reflected in our philosophy and existing cognitive models, and it was heavily ingrained into every other squad leader that went through those same training lanes. Success was measured in the amount of aggression. Every situation was expected to be met with aggression, even if the situation in real life would have warranted otherwise.

The Army combat arms needs the EDM as soon as possible. I'd love to see this in other fields, but right now my concern is within combat formations and the application of working models of *auftragstaktik* for the squad leaders. (Focus Group, Thursday, 1:22 PM.)

The participants appeared to agree that the EDM had potential beyond the scope of this study. This was particularly true for the three non-Infantry squad leaders who, although they had plenty of experience leading dismounted patrols, also expressed a desire to consider the cognitive model outside the focus of this study. The tone of the discussion was optimistic, particularly when, after re-naming the model, the participants seemed excited by the prospect of the model's potentially wider application. However, the discussion facilitators felt compelled to nudge the focus group discussion back on track. (Researcher notes, May 21, 2015.)

4.3 Theme: Factors of Consideration prior to/during Battle

Daniel, the only Marine and only officer of the focus group, now described the purpose and utility of the new model, EDM. His point of contention was that the mission statement, alone, mustn't be the only deciding factor in the first question, "Is this mine?" (Focus Group, Wednesday, 1:13 PM.)

Daniel relayed the story of an US patrol seeking to conduct a "shura" – a consultation meeting between key leaders of the nearby Army unit with influential members of the local tribe. Minutes before this meeting was to take place, the US patrol detected a small enemy patrol moving through their area. It was clear that the US patrol could have quickly and decisively overwhelmed the enemy patrol, plus just such a use of deadly force was granted in their mission briefing. Yet the US patrol held its fire and chose not to engage the enemy patrol. Instead, they posted security and conducted the shura. The tribal elders later dealt with the enemy presence through the local police, and thereby gained greater credibility with the local people.

> This (model) is applied within the initial seconds of contact, be it visual, audio, or kinetic, in order to buy time and space for the appropriate coordinated response. That being said, once contact is made, individuals and teams conduct their immediate actions and the squad leader is already moving through this matrix in his mind. The purpose of this matrix is to focus the efforts of the squad.
>
> Here is where I think the wrong question is being asked, and where Johan has a very valid point on restraining troops cognitively. When asking about the "scope of my mission," this focuses thoughts onto a specific tasking statement within the execution paragraph of the combat order. This removes the effects the enemy/civilian/partner unit may have on the battle space.

I think a better question would be "Does this fall within my commander's intent?" I would say that this question should also be the second step in the process. The number one thing is defeating the immediate threat to life, which can be handled by the old BDM – can I kill the threat? Then kill it. If not, do I need to hold up or run away? Now if the threat is not posing immediate danger of unit destruction, then we get to play with second and third order effects.

Restricting ourselves to only consider what is in our mission statement cuts out our ability to decide. Mission statements define what we are to do. Commander's Intent defines how we are to make decisions. (Focus Group, Wednesday, 1:13 PM.)

Sage then backed Daniel's point. Sage furthered the perspective of a relative threat, meaning that when there is greater time and space already existing between the squad and the enemy, the balance between mission and Commander's Intent can be more difficult to achieve. His point was that when the enemy force is so close that survival of the squad members becomes the overriding concern, force protection under the ROE becomes the primary objective, and both the mission and Commander's Intent are relegated to lesser priorities.

Nate lamented that while issues of mission statement, Commander's Intent, and ROE are constantly emphasized in squad training, Nate also insisted that as a young Infantryman that what he witnessed from his leaders was a very different behavior. It was the case of "do as I say, not as I do." But of course, Nate noted that Soldiers will by default imitate the conduct of their superiors:

I wish this would have been laid out to me (in training). When I went through as a rifleman, my leaders seemed to always measure success by the body count. Well, when I got into leadership positions, what do you think I measured success on? Body count!

I feel like it's almost in our culture to look at it like that simply because we can. We have the technological advantage. We can kill each other! But of course that's not a good metric for success.

This has been a huge challenge for me throughout my training. No matter what tactical situation, my mind always defaults to the decision to kill. I've become great at attacking because that's the only thing I've ever done when faced with the choice.

This updated model is a great tool that should be stressed to Soldiers from the very beginning. And we as instructors need to practice what we preach when it comes to things like this out in the field. Because it's only viable to the Soldiers if we make it viable by actually using it. Growing up in the leadership institution, I was told by seasoned instructors about this many times. But when I was out in the field with those same guys, how many times did I see them not use it and just fight through a situation which we clearly should not have engaged? Try 95 percent on the time. The EDM is the solution to this problem. (Focus Group, Wednesday, 2:54 PM.)

Sage responded:

We also see this very same problem in (simulation training). Not just because it is fun to shoot at each other, but because we have some cultural affliction with body count. "Killing the enemy moves us that much closer to our own victory," we think. Yet it leads to all sorts of other problems, like not knowing how to withdraw, or waiting too long to withdraw. The result is more casualties, and a mission failure. (Focus Group, Wednesday, 3:10 PM.)

The theme of factors of consideration presented the most reflective introspection amongst the participating squad leaders. Participants appeared at times to struggle with reconciliation of what they believed they should consider immediately prior to and during battle, with that of reality –

their cognitive behaviors in real world application. The participants each expressed a strong sense of duty to the mission, Commander's Intent, and ROE while also reconciling those obligations to an equally strong sense of duty to the safekeeping of the members of their squads. (Researcher notes, May 20, 2015.)

4.4 Theme: Factor Sequencing

Larsen attempted to offer a description of successful decision-making from his experiences as squad leader through an articulation of his tacit cognitive process. He suggested it was a matter of combining screening triage with hierarchical sequencing:

> When patrolling, we are not yet thinking about pulling a trigger. We are thinking of the mission – not killing. We're constantly weighing the mission. So when we detect enemy, the mission is already at the forefront of our conscious thought. The problem is that our squad leaders jump right from thinking "mission – mission – mission – ATTACK!"
>
> That's wrong. That's what we want to change. How many times have I witnessed this? Am I exaggerating if I say "thousands of times"? And how often does this immediate shift from the mission into kill-mode get our patrols into trouble? Way too often.
>
> Why? Because these squad leaders aren't thinking like masterful leaders. Masterful leaders aren't measuring their success by the number of dead enemy bodies. Instead, the masterful leader is thinking in terms of, "What is my mission? What's my piece of the pie? Where do I apply pressure? Where do I get the greatest return on investment for the least amount of effort? How do I protect my most precious resources – my Soldiers?"
>
> As the masterful leader moves through the battlespace, they are not looking for a fight. They're looking to achieve their mission through the Commander's Intent and congruently with the ROE. But that takes clarity of focus. They ask, "What is my mission?"

The first question, “Is this mine?” absolutely gets to the heart of *auftragstaktik* through the Commander’s Intent. The question does not ask, “What is Paragraph 3. Execution of the OPORD?” The question is more broad than that. It allows the squad leader to take up this new task in as much as it is within the scope of the Commander’s Intent.

It should be the first question in the matrix. For example, Sage’s earlier story of the Combat Engineers clearing mines on the mountain pass when engaged from an enemy patrol at great distance? Yep. Exactly. Sage admits that he realized instantly that chasing the enemy around the countryside was not his mission that day.

That said, Sage did not stop thinking through the matrix. Why? Because he wanted to further develop contingency plans for the enemy’s “most likely” and “most dangerous” courses of action. And he did so by asking the next question….

None of this takes away from a right to survival, a right to self-defense. If anything, this model reinforces that right. When a Combat Engineer team conducting mine clearing along a road wanders into a near ambush – a react to ambush battle drill is absolutely within the scope of their mission! Absolutely. Because I promise you that the Commander’s Intent did not read, “Take your Engineer squad and get them all killed today.” Nope. That commander wanted the mountain pass cleared of mines. And that mission demands the survivability of the Engineer squad conducting mine clearing.

So absolutely nothing of this decision-making model removes initiative from the squad leader with boots on the ground. Not at all. The opposite – the model empowers him/her to complete their mission with the least amount of spent resources, e.g. dead Soldiers.

Said another way, if we don't ask about mission, then our model does not prompt the squad leader to think about the mission parameters, Commander’s Intent, or ROE. Again,

> the problem we're seeing is that squad leaders have not been (prompted to) this question at all. Instead, upon contact with the enemy, the squad leaders move directly into question number one, "Can we take them alone?" Attack! There is zero consideration of Commander's Intent, *auftragstaktik*, force protection, or even mission accomplishment. None. Upon sighting enemy, we reflexively attack with little thought whatsoever.
>
> That needs to be fixed. The solution is to add the question of mission to the very front of the matrix. (Focus Group, Wednesday, 4:04 PM.)

Sage again offered that when the enemy is farther away, he believed the cognitive model should allow for options, rather than compelling the squad leader to take offensive action:

> I mentioned earlier that perhaps "Is this mine?" might better follow "Can I win?" After sleeping on it, I don't think so. I have two reasons. First, squad leaders need to break the current mindset for ourselves and for our Soldiers. Asking the correct question first is the right way to do this. Second, with training the mission order no longer matters. Our minds usually start solving problems like this in any manner other than a linear flow chart.
>
> This is the question being asked by people on the ground, covering the proverbial last 100 yards. Several kilometers out, it does not change much. At that distance having a decision making process that enforces a reference to the commander's intent two levels up is not something we want all the time. Nor do we want the current (BDM) method which asks, "Can we take them?" – followed by, "Yes" and the implied "Screw the mission!" (Focus Group, Wednesday, 4:59 PM.)

Jackson now chimed back into the conversation. He proposed that the EDM was central to the military philosophy of *auftragstaktik*, and essential for waging battle. Jackson insisted that all warfare is asymmetric in a tactical sense, because the squad leader should constantly seek the

enemy's weakest point and then exploit that weak point. Moreover, Jackson argued that the tactic of bypass is the key tactical maneuver that allowed each squad leader leeway to attack decisively at a point or angle of his own choosing. And with the EDM as stated, the bypass would now be the default tactic, as opposed to the prescriptive tactic of attack offered through various other cognitive models currently used by the Army.

> This was the point I tried to make a few years ago when I realized that bypassing is the essence of *auftragstaktik*. It is the first option I think of when I make contact with the enemy, not the last. I ask, "Do I need to fight right now?"
>
> For instance, when I'm tasked with a screening patrol, I may not need to fire to disrupt an enemy recon effort. If I'm tasked with a guard mission, however, then firing and attacking the enemy's recon elements is required and needed. Two very similar tasks, yet based on the tactical situation, my response to almost identical stimulus may differ.
>
> Long ago I realized that if I run around attacking everything, I'll quickly have no Soldiers to complete the mission. The BDM essentially requires an attack as the first option to any contact with the enemy. Yikes! We see this a lot in with newer squad leaders. There is little willingness to ever break contact with an enemy patrol, even if the situation requires it.
>
> How did Erwin Rommel get so far ahead of his German army corps during the invasion of France? He bypassed French strongpoints and massed an attack only when he had far superior forces. He advanced so far ahead of the rest of his assigned corps that he moved outside of radio communication and earned the title of "ghost division" – which was an insult levied against him by his peers, jealous and outdated German officers. Yet Rommel was one of the only division commanders to maintain a culture of *auftragstaktik* during the invasion, and achieve his assigned tactical objectives.

> The idea that all solutions will require my weapon is ridiculous. As a warrior, I realize that I am the center of action, not my tools. My weapon systems are merely an extension of me. I do not let my tools dictate how I will get the mission done; I will leverage them to my advantage, but I will not become a slave to my weapons. (Focus Group, Wednesday, 4:39 PM.)

Later on the evening of the second day of the focus group study, Sage commented again that the order of the EDM questions seemed right. He spoke of that same incident of clearing landmines along a mountain road in Southwest Asia, noting that the question of "is this mine?" was in fact the first thing he thought – even if he asked the question in a nuanced manner. (Researcher notes, May 20, 2015.) Sage added:

> I have found this to be a timely discussion and a good mental wake up for those of us who have been executing the missions, often without the self awareness of what exactly we are doing. "It just feels right" can not be passed on. That response means that we have learned something, internalized it, and use it, but at the same time do not really know what the "it" really might be. Or perhaps, as was my case, I knew the concept, but did not have a good method to explain it.
>
> I have already found good use for this new version. And foresee it as an excellent beginning when passing on our knowledge and skills to the next Soldier, Marine, Airman, and Sailor. (Focus Group, Wednesday, 7:11 PM.)

The next morning, after reading and re-reading the posts from the previous day, Larsen noted that it seemed as though the focus group had reached some consensus on the problem with the BDM, a fix to the cognitive model, plus a naming convention and rationale. He asked the focus group, "Is this complete?" (Focus Group, Thursday, 9:00 AM.)

Sage responded, “Is it complete? Well, I bet you a doughnut that the propagators of the original BDM though their version was (complete). For now, however, it is a very functional tool.” (Focus Group, Thursday, 9:50 AM.)

Minutes later Jackson joined in, “I would say so.” (Focus Group, Thursday, 10:18 AM.) The theme of factor sequencing produced the most heated debate amongst the participants. At least two of the participants later reversed their original position on this issue after having a night to reflect. Again, two competing demands played out in this discussion – firstly that the mission must be a success, which predicated the squad leader’s authority to solve problems through the creative employment of all available resources; and secondly that the squad leader must retain the right to preserve and defend the members of his squad. (Researcher notes, May 20, 2015.)

V. DISCUSSION

The four participants of this focus group started the conversation with a fairly wide divergence of perspectives. This is to be expected. The nature of phenomenological study is often described as a conversation of comparing “how green is green to you?” Even with purposive, homogeneous sampling, no two people experience decision-making as squad leader exactly the same way.

The divergence narrowed to an appreciable measure of convergence by the end of the three-day email chain discussion. This, too, is to be expected because the four participants of this focus group study were selected on a basis of purposive, homogenous sampling. We sought participants with substantial experience at the level of squad command within tactical operations for the purpose of exploring lived experiences of squad leader decision-making under austere conditions of time-pressed, high-stakes performance to articulate and identify tacit knowledge.

RQ1: What concerns do squad leaders express with current models of decision-making?

Theme 1A. Lack of Flexible Decision-Making Authority

Where this focus group saw almost instant consensus was in identifying the problem with the present cognitive model, the Battle Drill Matrix (BDM). Official recognition notwithstanding, the BDM and its many variants thereof are prescribed throughout training of Army doctrine, and invariably foster a normative practice of engagement-through-attack for the squad (FM 4-01.45, 2005; FM 3-21.8, 2007).

The BDM illustrates that prescribed normative practice. Upon contact with an enemy force, the BDM prompts the squad leader with a series of sequential questions (Larsen & Wade, 2013):

1. Can my squad defeat the proximate enemy force? If yes, attack. If not…
2. Can my squad defeat the proximate enemy force with help? If yes, gain help. Attack.
3. If not, can we defend? If yes, defend. If not, withdraw.

The participants of this focus group displayed keen awareness that violence of action – an immediate and brutal attack – can in very specifically circumstances produce victory for the squad. This is particularly true in cases of near ambush in which there is often less than a second to make a decision, and the outcome is usually disastrous for the unsuccessful squad.

Regarding that reality, the focus group participants were reluctant to categorically forfeit the option of aggressive attack. Yet even in light of this reluctance, the four participants readily identified the emphasis on attack as the principle defect of the cognitive model. The Army's model, official or otherwise, was predicated on the attack, with other options seeming of lesser consequence and therefore less desirable than an immediate implementation of violence.

The participants perceived such cognitive models as inflexible. Participant experiences with these models were described as limiting the squad leader's tactical options, and in so doing rendered the squad actions predictable in the face of an intelligent enemy. Furthermore, the emphasis on the tactic of attack as the Army's primary and preferred action all too often resulted in unnecessary American casualties, and failed missions.

The participants shared experiences to illustrate the oftentimes inexplicably harsh punishment for squad leaders who refused to attack upon detecting an enemy presence. As powerful as stories of these experiences were, it was the opposite experience that seemed to resonate most with the participants of this study. That is, stories of experiences in which the squad leader wisely opted not to attack in the face of the enemy – and yet still managed to achieve the mission appeared to resonate best with the participants of this focus group.

Theme 1B. Lack of Situational Transferability

Interestingly, the Combat Engineer and both participants from Military Intelligence backgrounds brought up the issue of transferability of the cognitive model for decision-making. This might be explained by the emphasis placed on the descriptor "during battle" which is not exclusive to the Infantry, but is the expressed purpose of the Infantry occupation. However, all four participants had routinely embedded in combat patrols in direct support of Infantry. The idea of making decisions in battle wasn't an anomaly to any of them. So their concern of transferability seemed curious, but also worthy of further exploration.

Yet the participants and researchers from Infantry backgrounds were quick to remind the others that the issue of the cognitive model's transferability was outside the scope of this study. That point, too, was valid. The participants had been asked to expect a focus group discussion that might take one day, and could possibly expand into several or more days. That is precisely

what happened. The email chain discussion spread over the duration of three days. If the scope of the study had been expanded to include transferability to other disciplines and industries, we would have needed at least multiple weeks of data collection. Furthermore, the criteria for the purposive selection of homogeneous participants for this study would have been woefully invalid.

Jackson reminded the focus group that the scope of this study was to determine how squad leaders make decisions in battle. If a codified process later proved relevant to other industries, all the better. But, as Jackson warned, this desire should not be allowed to obscure or redirect the focus of the study at hand.

It can also be argued that when a codified cognitive model resonates with a population, it does so because the model is an accurate representation of what successful people already do. Generally speaking, the cognitive model isn't accepted as "true" because its inventors convince people that they created a useful new process. Rather, the model is a codification of an existing cognitive process already leveraged by successful people, such as with the OODA (Boyle, 1996) and RPD (Klein, 1999) models. The codifying process simply articulates this tacit knowledge into an explicit model. The value is the cognitive model's utility, not the creator's credentials.

Still, Johan insisted that the model's name should immediately bring to mind the model's utility – what the model offers the user. He clarified that, as he saw it, the purpose of the cognitive model was to decide whether or not to engage an opponent in battle. Johan offered that as a rationale for the cognitive model's moniker, the Engagement Decision Matrix (EDM, pronounced *idiom*).

The participants agreed. This seemingly innocuous step of obtaining consensus on the model's moniker had a profound effect. It not only refocused the discussion toward a singular

framework of squad leader experience, but it also served to express yet another underlying dissatisfaction with the Army's current cognitive models – they aren't perceived as transferable even between specific conditions of battle engagements.

The Army's official models of decision-making, such as variants for dismounted battle drills (FM 3-21.8, 2007) and for mounted convoy operations (FM 4-01.45, 2005) as well as the unofficial BDM (Larsen & Wade, 2013), are all unique to specific conditions of battle. That is, these models work well within specified conditions, but do not transfer well to other conditions of battle engagement. Yet the conditions in which a squad might engage the enemy in battle can easily number into hundreds of different conditions. Participants of this study relayed bitter experiences of using these cognitive models within inappropriate conditions. Those experiences often resulted in vulnerability to the squad members, and potentially even punitive action against a squad leader who refused to needlessly expose his Soldiers to harm.

RQ2: What factors do squad leaders consider when making decisions during battle?

Theme 2C. Factors of Consideration prior to/during Battle

With the EDM moniker established, the focus group then began to discuss the factors each squad leader considers in battle. The conversation was intense and often argumentative. Nonetheless, four factors of consideration emerged: Mission, Rules of Engagement, Commander's Intent, and a comparative estimate of the friendly and enemy disposition.

Mission: The focus group reached an appreciable measure of consensus on the factor of mission as a consideration fairly quickly. It may be more accurate to say that none of the participants denied the mission was a critical factor in deciding whether or not to engage enemy in battle. Yet the participants also seemed to describe the mission as "what the squad is to do." In this way, the mission is what the squad prepares for, and the squad leader continually

supervises. The mission is perceived as a factor of consideration because it directs the actions of the squad.

Rules of Engagement: The issue of ROE rose to the forefront of the conversation on the second day of the study, particularly the segment of the ROE covering force protection guidance and the Soldier's right to self-defense. While the focus group had quickly and unanimously identified the Army's predicated fixation on the attack as a weakness of current cognitive models, these same participants also expressed a sincere desire to retain the option of violent attack for circumstances demanding force protection and self-defense. Participants described the ability to protect the wellbeing of the squad as a critical factor of the squad leader's decision-making.

Commander's Intent: As a whole, the focus group seemed to place far more emphasis on the Commander's Intent for the mission. Daniel described Commander's Intent as an instrument that informs the squad leader "how we assign priority" through the commander's descriptive terms, rather than through the mission's prescriptive orders.

At this point there was considerable dispute. Nate agreed that Commander's Intent, along with ROE and the mission, should be factors of consideration when deciding whether or not to engage an enemy force. However, Nate asserted that very rarely had this been the practice. The group debated this for a short while, eventually validating Nate's experience. Four of the participants offered examples in which squad leaders violated existing cognitive models of decision-making within the application of Army training. All seemed to agree this was routine practice.

It is a nuanced point, but one worthy of discussion. The focus group re-established that they were looking for tacit knowledge inherent of the exemplar. They recognized that all too

often during training, the Army placed pressure on squad leaders to employ cognitive models inappropriate to the situation at hand. The result was that many squad leaders learned to ignore the models entirely and order an attack by default, as if it were the inevitable outcome.

Estimate of Enemy vs. Friendly Forces: Another identified factor of consideration involved an estimate of the enemy's relative combat power in comparison to the combat power of friendly forces. The word "estimate" may not be entirely accurate. The participants described it more commonly as a perception or an awareness of enemy combat strength as compared to the friendly squad's combat strength. Under the pressure of time or the hazard of enemy fire, the estimate took the form of assumptions based on the squad leader's perception of the situation.

Curiously, the focus group appeared to place less emphasis on this factor of consideration. That may be understood, as the four participants have often experienced situations in which a squad leader misperceives the situation. The enemy force may actually be larger than his own squad, or better armed, or possess superior terrain from which to defend or attack. Misperception is neither negligence nor bravado on the part of the squad leader, but instead it is experienced as an inherent risk of leadership in warfare. Combat is dynamic. Participants describe the battle engagement as a fluid situation in which a misperception of relative combat power may persuade the squad leader to an incorrect assumption of who has the upper hand. Is it the friendly squad or the enemy force?

Furthermore, Sage commented that considerations of weighing relative combat power between friendly and enemy forces do not necessarily occur in an orderly sequence. He described it as nearly simultaneous and reiterative process that may take only a second or two. Only when time and space permit can the process be slowed into a more deliberate decision-making process from which multiple contingencies may be developed.

Theme 2D. Factor Sequencing

The most heated debate between participants of the focus group was over how each of the factors of consideration are cognitively sequenced by squad leaders in battle. A line was drawn between those participants who insisted on force protection as the first consideration, versus participants who favored freedom of maneuver as the first consideration. In a sense, this became a question of force protection inherent of ROE versus the implied maneuver of Commander's Intent.

Daniel and Jackson favored Commander's Intent as the first consideration of the squad leader. Daniel asserted that considerations of the mission and even ROE were too prescriptive. Jackson claimed that the freedom to maneuver, specifically to bypass each enemy obstacle that wasn't within the parameters of the Commander's Intent, was more critical than the mission or even ROE.

Johan and Sage favored ROE as the first consideration of the squad leader because, as they both explained, squad leaders must retain the ability to protect the squad through violent attack. The principle concern here was the proximity of the danger to the members of the squad. Yet even here, Johan and Sage conceded that this was only the case if the level of danger was immediate. Indeed, they argued that a salient aspect of the decision whether or not to engage an enemy force in battle was to create enough time and space for the squad leader to develop a better plan of action and to coordinate resources to effect that plan.

Consequently, Larsen recommended a compromise of sorts with the first question of the EDM feasibly including all three considerations. For situations in which the enemy's immediate proximity presented a potential or realized threat to the squad, the question, "Is this mine?" assumed a protective posture in keeping with the ROE right to self-defense and force protection. In that case, ROE considerations might supersede the mission and Commander's Intent.

Otherwise the question, "Is this mine?" must include factors of considerations for both the mission and Commander's Intent when there was enough time or space between the squad and the enemy threat. This distinction was important because a squad leader never yields his responsibility of force protection of the Soldiers, but also bears the burden of mission success. In this manner, the EDM accommodates all three factors for consideration within the very first question, "Is this mine?" – Mission, ROE, and Commander's Intent – with each consideration taking turn in priority depending on the immediate threat presented by the enemy force.

Codifying the EDM as a Cognitive Model

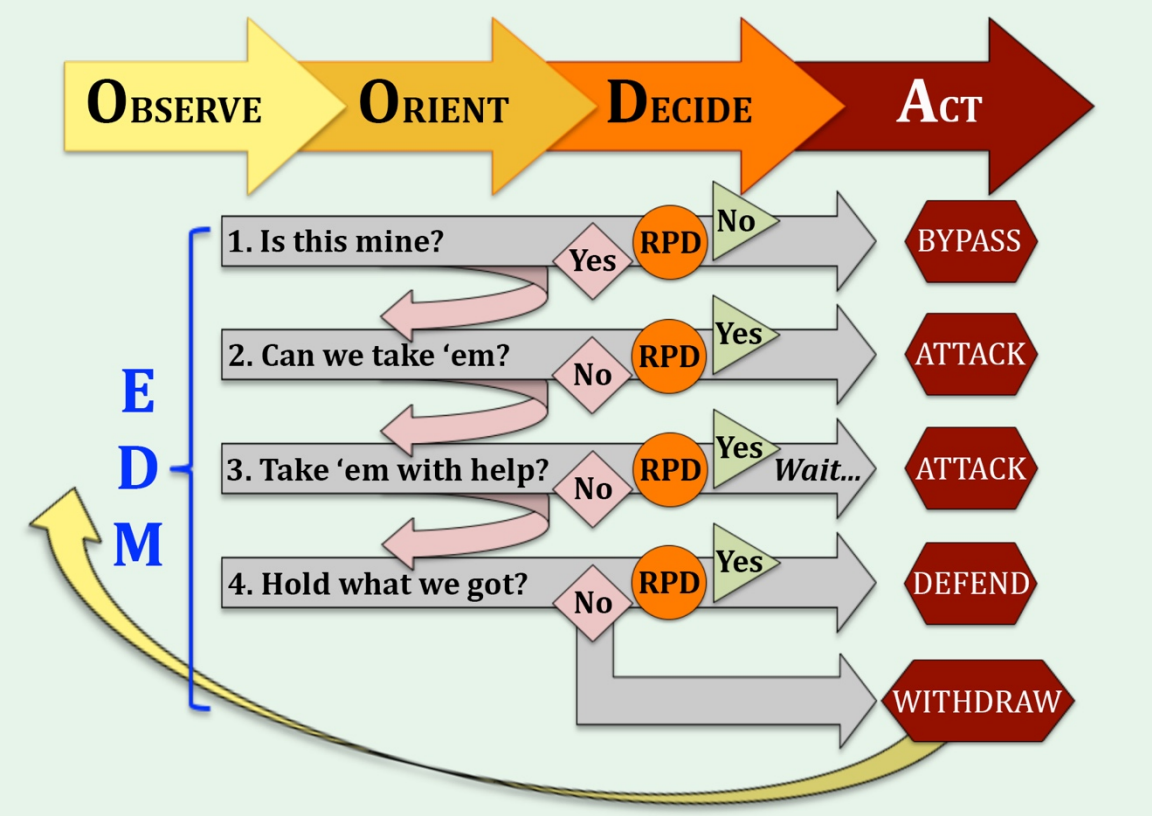
The central research question of this study was, "How do squad leaders describe the experience of making decisions to engage enemy in battle?" Squad leader decision-making is a highly complex task under austere conditions. The stakes are high. Time and space are short.

The four participants of this study describe squad leader decision-making as directed toward achieving a tactical mission, e.g. "what we must do," while weighing guidance provided in the Commander's Intent, e.g. "how we assign priority," while also remaining compliant to the legal parameters of the Rules of Engagement. Squad leaders conduct decision-making in a wide variety of terrain, weather, and visibility conditions that obscure the squad leader's perception of the enemy force. And yet the squad leader bases decisions whether or not to engage the enemy in battle upon that all too often obscured, imperfect perception of the battlefield.

The focus group participants of this study frequently referred to a single participant's experience as a working example of squad leader decision-making. In that incident, the squad leader had gained visual contact with an enemy patrol while his Combat Engineer squad was conducting landmine clearance of a highway through a mountain pass in Southwest Asia. The

squad leader alerted the engineer squad to halt, and immediately began the EDM cognitive process.

Figure 3: *The EDM Cognitive Model links OODA Loop to RPD*



1. "Is this mine?"

Here the squad leader asks, "Is this task within the scope of my mission and my Commander's Intent, or are we saving ourselves from the immediate threat of destruction in accordance with the Rules of Engagement?"

The squad leader decides, no. There is no immediate threat from the enemy. At more than a kilometer away, the enemy patrol is out of the effective range for small arms. Chasing enemy foot patrols is not within the scope of his mission, unless they become a direct threat to his engineer squad. The squad leader orders his Soldiers to continue their mission, but observes the enemy and reports the enemy's position to higher command.

A critical component of this decision-making is the enemy threat's proximity. Had the enemy patrol been close enough to present a serious threat to the squad, then force protection concerns as per the Rules of Engagement would have immediately superseded consideration of the mission or Commander's Intent. But that was not the case in this example.

2. "Can we take them?"

At this point in the cognitive process, the squad leader asks, "Can my team win this battle engagement, alone?" Notice that in our example the squad leader continues to move through the cognitive process as a form of contingency planning, even though he has already reached an initial course of action during the very first step. The question at hand is whether his engineer squad will be successful if attacked.

The squad leader decides, yes. The enemy patrol is on foot and appeares to carry only small arms and possibly one rocket launcher. He decides that if the enemy move against his engineer squad, they are capably armed to defend themselves, and have the additional advantage of their armored vehicles. But these advantages are conditional and temporary. Once darkness sets in, or if the enemy patrol turns out to be part of a larger enemy force, then the enemy will be able to outmaneuver the engineers, who are dedicated to clearing mines from the mountain highway. That enemy course of action might leave his squad vulnerable to enemy attack.

3. "Can we take them with help?"

Again, even though a course of action has been selected, the contingency planning continues. The squad leader asks, "If I cannot win alone, are there other resources available to me?"

If the enemy patrol is actually part of a larger enemy force, can the engineer squad win a battle engagement if they are assisted from a nearby friendly unit? The squad leader decides, no. If the enemy patrol is part of a larger force, nearby friendly forces are too far away to positively

impact the outcome of any potential battle engagement. Close air support and artillery can be brought to bear against the enemy, but his engineer squad has no attached artillery forward observer, so indirect fire coordination will be rudimentary and likely ineffective. The squad leader concludes that a supported attack against the enemy is not a feasible course of action given the current friendly forces situation.

4. "Can we hold what we've got?"

The squad leader now asks, "Can my team defend our current position given our present combat power if the enemy conducts a larger, coordinated attack?"

The squad leader decides, no. The squad leader assesses his own forces in comparison to the enemy's force, albeit he is aware that his perception of the enemy force is obstructed. But he knows his engineer squad lacks a sufficient number of Soldiers, enough weaponry, or even superior terrain to sustain a defense in the event the enemy force is considerably larger than his squad, or the enemy gains the upper hand in maneuverability, such as the ability to move within the range of near ambush supported by rocket launchers.

The squad leader decides that for now his engineer squad will continue their mission. If the small enemy foot patrol takes aggressive action to engage his squad, he is confident his squad can defeat the enemy in decisive battle. However, if a larger enemy force engages him in battle, his engineer squad will have no choice but to conduct a tactical withdraw.

Through the participant story expressed above, the EDM appears to offer squad leaders cognitive dominance through greater flexibility in decision-making. Unlike earlier models that typically resulted in binary fight-or-flight outcomes, the EDM asks four questions to arrive at five possible outcomes – bypass, hasty attack, supported attack, defend, or withdraw.

The EDM may have greater transferability across a broader spectrum of situations and battle conditions than earlier cognitive models. The EDM seems to apply to the complete range of tactical conditions inherent of battle engagements, and if so, may offer a considerable measure of cognitive dominance for a broad range of missions.

Furthermore, the EDM appears to bridge existing cognitive models of Boyd's OODA (1996) and Klein's RPD (1999). The EDM provides a descriptive performance in which squad leaders employ RPD within the decision stage of OODA. If this bridging of the three cognitive models holds true for decision-making inherent of other disciplines, the EDM may potentially present greater implications as a decision-making model for scholarly academics, political and business enterprises, or medical and emergency services.

Limitations & Future Study

Interpretive phenomenological analysis is subjective by its nature because researchers are the instrumentation. Findings of this study are therefore limited by the researchers' interpretation. Yet this method is an experiential approach to qualitative research that seeks to understand the lived experience of the participants – specifically squad leaders tasked to conduct combat patrols.

Admittedly, the deeply intimate positionality of two of the researchers in relation to the four participants of this study rightfully raises the question of bias interpretation. We attempted to mitigate the potential for bias by employing a third researcher as an arbitrator of data analysis. Furthermore, it bears discussion that the third question arose from nascent opportunity – "How do you reconcile the aforementioned problems of current cognitive models with decision-making prior to and during battle engagements?" That opportunity might not have presented itself if two members of the research team had not been so intimately familiar with the lived experience of

squad leaders. We believe this is a critical consideration of our method. That third question permitted a unique opportunity to codify the EDM as a cognitive model of decision-making.

Lastly, the small number of participants in this study was both an asset and a limitation. Within the framework of IPA, a small number of purposively selected participants on a basis of homogeneous sameness is advantageous because it affords an in depth exploration of the phenomenon. Yet the very small number of participants also raises the question of whether or not the described experiences resonate with larger populations, even within the homogeneous demographic. And in part, that may have to do with human memory. This study was conducted through memory recall of highly volatile, emotional incidents of battle engagement. Memory is elusive and recall is often imprecise. Thus while the researcher team has dutifully attempted to represent each participants' interpretation of their own experiences in this work, the IPA method demands that researchers also offer interpretation of the participants interpreted meaning. This forms an analogous asymptote, whereby the participants' interpreted meaning represents a curved line that approaches but never meets the researchers' straight line axis of interpretation. The EDM cognitive model may not represent a rigid process of any single person's experience, but instead approximates a highly complex cognitive process authentically enough to be useful as a descriptive means of processing high-stake decisions under austere conditions.

The EDM cognitive model will of course require further research in wider application to both qualify and quantify confirmation of the findings of this study. The authors of this study intend to conduct further research. The EDM cognitive model proposed through this work may inform future military doctrine and shape the cultural philosophy of military arts as a practice.

References:

Avrahami, Y., & Lerner, M. (2003). The effect of combat service and military rank on entrepreneurial careers: The case of Israeli MBA graduates. *Journal of Political and Military Sociology*, *31*(1), 97.

Berglund, H. (2007), Researching entrepreneurship as lived experience, in *Handbook of Qualitative Research Methods in Entrepreneurship*, H. Neergaard and J.P. Ulhøi (Eds.), Cheltenham: Edward Elgar.

Boyd, J. R. (1996). "The Essence of Winning and Losing." *Unpublished lecture notes*.

Brocki, J. M. and Wearden, A.J. (2006). A critical evaluation of the use of interpretative phenomenological analysis (IPA) in health psychology, *Psychology and Health*, *21*(1), 87-108.

Brown, R. B. (2011). "The Infantry Squad: Decisive Force Now and in the Future." *Military Review, 91*(6), 2.

Carpenter, D. R. (2007). Phenomenology as method. In H. J. Streubert & D. R. Carpenter (Eds.), *Qualitative research in nursing: Advancing the humanistic imperative* (pp. 75- 99). Philadelphia, PA: Lippincott.

Cope, J. (2005), Researching Entrepreneurship through Phenomenological Inquiry: Philosophical and methodological issues, *International Small Business Journal*, *23*(2), 159-183.

Easterby-Smith, M. T. (2002). R. and Lowe, A. (2002). *Management Research: An introduction, 2,* 342.

Eisenhardt, K. M. (1989), Building Theories from Case Study Research, *Academy of Management Review*, *14*(4), 532-550.

FM 3-21.8. (2007). *The Infantry Rifle Platoon and Squad*. Washington, DC: Department of the Army.

FM 4-01.45 (2005). *Tactical Convoy Operations: Multi-Service Tactics, Techniques, and Procedures*. Washington, DC: Headquarters Department of the Army.

Giorgi, A. (2011). IPA and Science: A response to Jonathan Smith. *Journal of Phenomenological Psychology, 42*, 195-216.

Greening, D. W., Barringer, B. R., and Macy, G. (1996). A qualitative study of managerial challenges facing small business geographic expansion, *Journal of Business Venturing*, *11*(4), 223-256.

Hammond, G. T. (2001). *The Mind of War: John Boyd and American security*. Washington, DC: Smithsonian Books.

Hycner, R. H. (1985). "Some guidelines for the phenomenological analysis of interview data", *Human Studies*, *8*, 279-303.

Klein, G. (1999). *Sources of Power: How people make decisions*. Cambridge, MA: MIT Press.

Koch, T. (1995). Interpretive approaches in nursing research: The influence of Husserl and Heidegger. *Journal of Advanced Nursing*, *21*, 827-836.

Larsen, C. E. (1998). *Tactical Battle Drills for Small Units*. Kwangju, ROK: Seol Sang-Ho.

Larsen, C. E. (2008). *Paintball and Airsoft Battle Tactics*. St. Paul, MN: Voyageur Press.

Larsen, C. E. and Wade, N. M. (2013). *The Small Unit Tactics SMARTbook*. Lakeland, FL: The Lightning Press.

Larsen, C. E. (2015). *A Case Study of the Cognitive Apprenticeship Model in Leadership Education*. Retrieved from: https://mospace.umsystem.edu/xmlui/handle/10355/46874.

Mani, K. (2007). Militaries in business state-making and entrepreneurship in the developing world. *Armed Forces & Society*, *33*(4), 591-611.

Mundweil, P. J. School of Advanced Military Science. (2013). *Overmatch: Enabling the Infantry rifle squad as the foundation of the decisive force*. Fort Leavenworth, KS: US Army Command & General Staff College.

Pamphlet 525-3-7. (2008). *The U.S. Army Concept for Human Dimension in Full Spectrum Operations*. Fort Monroe, VA: US Army Training & Doctrine Command.

PEO STRI. (2014). *Squad Overmatch Study FY14 Final Report: Training human dimension to enhance performance*. Orlando, FL: US Army Training & Doctrine Command.

Plummer, K. (1983). *Documents of Life: An introduction to the problems and literature of a humanistic method.* London, UK: Unwin Hyman.

Reid, K., Flowers, P., & Larkin, M. (2005). Exploring Lived Experience: An introduction to Interpretive Phenomenological Analysis. *The Psychologist, 18*(1), 20-23.

SFDF. (2014). *Squad: Foundation of the Decisive Force*. Fort Benning, GA: Maneuver Center of Excellence. Retrieved from: https://www.benning.army.mil.

Senior, V., Smith, J. A., Michie, S. and Marteau, T.M. (2002). Making Sense of Risk: An interpretive phenomenological analysis of vulnerability to heart disease, *Journal of Health Psychology*, *7*(2), 157-168.

Seymour, R. G. (2006) Hermeneutic phenomenology and international entrepreneurship research, *Journal of International Entrepreneurship*, *4*(4), 137-155.

Smith, J. A. (1996) Beyond the Divide between Cognition and Discourse: Using interpretative phenomenological analysis in health psychology. *Psychology & Health, 11*(2), 261-271.

Smith, J. A., Jarman, M., & Osborn, M. (1999). Doing interpretative phenomenological analysis, in M. Murray and K. Chamberlain, (Eds.), *Qualitative Health Psychology*, London: Sage.

Smith, J. A. (2004). Reflecting on the development of interpretative phenomenological analysis and its contribution to qualitative research in psychology, *Qualitative Research in Psychology*, *1*, 39-54.

Smith, J. A. & Eatough, V. (2006). Interpretative Phenomenological Analysis, in *Research Methods in Psychology,* G.M. Breakwell, S. Hammond, C. Fife-Schan and J.A. Smith, (Eds.), London: Sage.

Smith, J. A. & Osborn, M. (2008). Interpretative phenomenological analysis, in *Qualitative Psychology: A practical guide to research methods*, 2nd edition, J. A. Smith, (Ed.), London: Sage.

Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. *Health Psychology Review, 5*(1), 9-27.

Yardley, I., & Neal, D. J. (2007). Understanding the Leadership and Culture Dynamic within a Military Context: Applying theory to an operational and business context. *Defence Studies*, *7*(1), 21-41.

Williams, B. S. (2010). *Heuristics and Biases in Military Decision Making*. Fort Leavenworth, KS: US Army Combined Arms Center.