

COGNITIVE DOMINANCE THROUGH THE ENGAGEMENT DECISION MATRIX

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Is disobedience the key to winning battles? A new study suggests that might be the case. When tanks, artillery, close air support, and targeting assets are removed from the infantry squad in battle, it appears that squad leaders win battles if they are willing to take action, even when their actions are in conflict with mission orders.¹

The autonomous authority to engage the enemy in battle, or not, can produce cognitive dominance and may ultimately achieve a decisive overmatch for U.S. infantry squads. In theory, mission command philosophy permits subordinate leaders the authority to disobey orders and directives — if only temporarily — when deciding whether or not to engage an enemy force.² The squad leader's authority and willingness to disobey orders and make quick decisions on behalf of his commander may just be the key to cognitive dominance.

That was the principal finding of a recent phenomenological study conducted last year.³ The research sought to describe squad leader decision-making experiences within the framework of battle engagement, including those last moments leading up to the engagement. As participating squad leaders reflected on their successes and failures in both training and battle conditions, the common experience of success centered on the squad leader's cognitive flexibility to solve problems. Squad leaders explained that their solutions were very often in direct conflict with mission orders, albeit only temporarily, until the immediate problem was solved and the squad leader could once again focus on the mission at hand. This was how they reconciled various factors demanding their immediate attention.



A Soldier with Company A, 1st Battalion, 155th Infantry Regiment, Mississippi Army National Guard, verifies information during a mission as part of the unit's National Training Center rotation on 31 May 2017 at Fort Irwin, CA. (Photo by SSG Veronica McNabb)

This discovery was interesting, particularly given that the Army has recently insisted that there are no existing models of cognitive dominance for infantry squad leaders engaged in high-stakes, time-pressured decision making on the battlefield.⁴ Furthermore, Army research suggests that infantry rifle squads have not improved since the onset of World War II.⁵ To address this issue, the Army conducted the Squad Overmatch Study through the Program Executive Office of Simulation, Training, and Instrumentation (PEO STRI), which in turn recommended three attributes for enhancement: technology, squad structure, and human dimensions.⁶

The Army is seeking solutions to infantry technological attributes through an initiative called “Squad: Foundations of the Decisive Force (SFDF)” at Fort Benning, GA.⁷ The idea is that battlefield operating systems organic to the infantry squad may be improved to better enhance intra-squad communications through Global Positioning Systems 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.

What remains unaddressed is the squad attribute of human dimensions. 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.”⁸ In his monograph for the School of Advanced Military Studies, MAJ Philip J. Mundweil described human dimensions as “conditions that members of a team develop, which increase[s] the capability of the formation.”⁹

PEO STRI more concisely describes human dimensions as an array of considerations — leader situational awareness, communicative process, and collaborative teamwork.¹⁰ Yet, the PEO STRI study focused only on what squad leaders perceived while offering no cognitive models of how squad members should think. While Mundweil identified cognitive skills as a critical component of human dimensions, he noted that models enabling cognitive dominance of the infantry squad were starkly absent from past work. He wrote, “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.”¹¹

The phenomenological study conducted last year by some of the authors of this article (Larsen, Lowrance, and Jackson) refined 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.¹²

Now, contextually prescriptive cognitive models do exist within the Army. They were the result of battle drills employed during the wars in Southwest Asia because the Army relied heavily on decentralized operations. The Army therefore implemented prescriptive battle drills as a means of the commander exerting a measure of control of battle engagements with enemy forces, even in the commander’s absence. For example, this situation prompted a collaborative effort by all branches of the U.S. armed forces to produce a field manual (FM) on convoy operations.

FM 4-01.45, *Tactical Convoy Operations*, recognizes a rudimentary decision matrix for executing battle drills during convoy operations, as does FM 3-21.8, *The Infantry Rifle Platoon and Squad*, in the section discussing the implementation and selection of battle drills.¹³ These cognitive models of battle drill selection have invariably fostered a normative practice of engagement-through-attack for the infantry squad. Prompted by the identified gap in cognitive models, Larsen and his associates conducted qualitative research through interpretive phenomenological analysis with the goal of describing the tacit cognitive process inherent of squad leaders making decisions prior to and during battle engagements. What concerns do squad leaders express with current models of decision making? And what factors do squad leaders consider when making decisions during battle?

The Larsen study employed interpretative phenomenological analysis (IPA), a research approach developed by Jonathan A. Smith, Maria Jarman, and Mike Osborn. This method uses focus group discussion through open-ended, semi-structured interview questions rather than interviews with directed questions.¹⁴ The idea was to capture detailed transcripts of squad leader descriptions while collaborating with them toward meaningful insight. IPA is at its core inductive and idiographic, demanding a detailed, nuanced analysis of the data.¹⁵ For this reason, four participants were selected through purposive and homogeneous sampling, which is normative practice for an IPA study.¹⁶

Although the study by Larsen and associates employed squad leaders from infantry, engineer, and military intelligence (MI) backgrounds, purposive and homogeneous sampling of these squad leaders ensured participants

had experiences in common and had demonstrated appreciable success within decision-making competency as squad leaders engaged in either authentically simulated and/or actual battlefield engagements.¹⁷

IPA is not a prescriptive methodology, but rather it allows for individuality and flexibility of approach to data analysis.¹⁸ This is not to say IPA lacks a systematic process, 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.”¹⁹

In this manner, IPA offered a dual process by which the squad leaders reflected on their decision-making experiences in battle in order to articulate tacit knowledge and make sense of those individual experiences, and in turn the researchers interpreted participant dialogue to achieve a more holistic description of the phenomenon.²⁰

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 a squad leader exactly the same way. True to form, the participants of the Larsen study began the conversation with a wide divergence of perspectives, as expected. Still, squad leader perspectives appeared to narrow toward an appreciable measure of consensus over the course of the three-day discussion.

The Larsen study 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.²¹

The effort to describe squad leader experiences presented an opportunity to codify a new cognitive model of decision making that the participating squad leaders named the Engagement Decision Matrix (EDM). Unlike earlier models that have predictably 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.²²

Lack of Flexible Decision-Making Authority

Squad leaders saw almost instant consensus in identifying the problem with the present cognitive models such as those found in FM 3-21.8 and FM 4-01.45 that invariably foster a normative practice of attack for the squad. Participating squad leaders described the Army cognitive models’ emphasis on attack as inflexible. Experiences with these models were described as limiting the squad leader’s tactical options and in so doing rendered the squad’s actions as predictable in the face of an intelligent enemy. Moreover, the squad leaders explained that the emphasis on the tactic of attack as the primary and preferred action all too often resulted in unnecessary casualties and failed missions.

The squad leaders displayed keen awareness that violence of action — an immediate and brutal attack — can in very specific circumstances produce victory for the squad. This is particularly true in cases such as the near ambush, in which there is often less than a second to make a decision and the outcome is often disastrous for the unsuccessful squad.

Regarding that reality, the participants were reluctant to categorically forfeit the option of aggressive attack. Yet, even in light of this reluctance, the squad leaders readily identified the emphasis on attack as the principle defect of the cognitive model. They described the Army’s model as being predicated on the attack, with other options being given lesser consequence and therefore making them less desirable than an immediate implementation of violence.

Lack of Situational Transferability

Interestingly, participating squad leaders from combat engineer and MI 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 responsibility of the infantry. However, all participants had routinely embedded in combat patrols. The idea of making decisions in battle wasn’t an anomaly to any of them. Furthermore, the study’s infantry squad leaders also expressed a dissatisfaction with the Army’s current cognitive models because the models weren’t perceived as transferable even between specific conditions of battle engagements.



A Soldier from Company D, 2nd Battalion, 503rd Infantry Regiment, 173rd Airborne Brigade, takes a knee after placing his Soldiers into tactical firing positions while participating in the unit's cumulative fire training event in Wedrzyn, Poland, on 30 November 2016.

(Photo by SGT William A. Tanner)

The Army's models of decision making, such as variants for dismounted battle drills and for mounted convoy operations, are all unique to specific conditions of battle.²³ These models work well within specified conditions but do not transfer well to other conditions of battle engagement. However, the conditions in which a squad might engage the enemy in battle can easily number into hundreds of variations. Participants of this study relayed bitter experiences of using these cognitive models within inappropriate conditions. Squad leaders described those experiences as often resulting in vulnerability to the squad members and needlessly exposing Soldiers to harm.

Factors of Consideration in Battle

The squad leaders then began to discuss the factors they consider in battle and immediately prior to a battle engagement. The conversation was intense and often argumentative. Nonetheless, four factors of consideration emerged: mission, rules of engagement (ROE), 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.

ROE: The issue of ROE rose to the forefront of the conversation on the second day of the study, particularly the segment of ROE covering force protection guidance and a 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 well-being 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. Participants 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. Half of the squad leaders 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, other participants asserted that very rarely had this been the practice. All of the participants offered examples in which squad leaders violated existing cognitive models of decision making within the application of Army training. The participating squad leaders agreed that this was routine practice. This is a nuanced point, but one worthy of discussion. The purpose of this study was to identify tacit knowledge inherent of the exemplary squad leader decision making in battle. The participating squad leaders reported that all too often during training, the Army unit trainers and evaluators 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, thereby disregarding the mission, commander's intent, and ROE when they made contact with the enemy.

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 or better armed than his own squad, or it may possess superior terrain from which to defend or attack. That misperception was described as being neither negligence nor bravado on the part of the squad leader, but instead participants regarded this experience as simply 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?

Factor Sequencing

The most heated debate between the participants involved the sequence of factors that squad leaders consider in or immediately prior to battle. A line was drawn between those squad leaders who insisted on force protection as the first consideration versus squad leaders 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. Those favoring commander's intent as a squad leader's first consideration asserted that considerations of the mission and even ROE were overly prescriptive and limited the squad leader's option to maneuver, specifically to bypass each enemy obstacle that wasn't within the parameters of the commander's intent.

Those participants favoring ROE as the first consideration insisted that 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, these squad leaders acknowledged 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.

Codifying a Cognitive Model

At this point the research team realized the situation afforded a rare opportunity to codify a cognitive model — if the two opposed camps of squad leaders could reconcile their objections. While not an original goal of this study (and indeed not a typical outcome of phenomenological research), it seemed counterintuitive and counterproductive not to pursue a possible solution.

First, all of the participating squad leaders had agreed that they routinely violated existing cognitive models offered through Army field manuals. But how did they do that? Specifically, what cognitive coping mechanisms did they employ?

Second, two camps of thought had emerged — one insisted that ROE and force protection measures took priority for decision making in battle, and the other insisted that maneuverability in accordance with the commander's intent took priority for decision making in battle. Could both camps be correct? Was the issue situational dependent

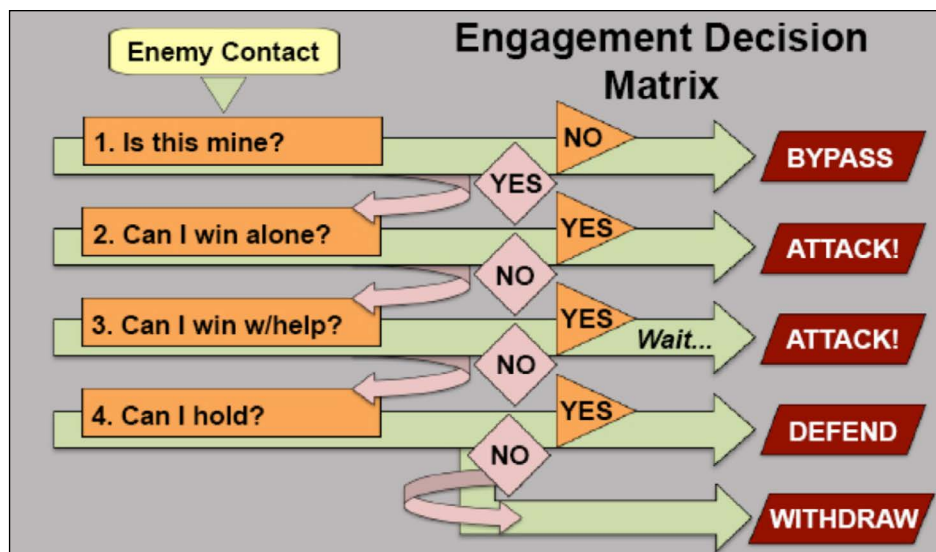


Figure 1 — Engagement Decision Matrix

in nature? EDM (pronounced “idiom”) emerged as a cognitive model through the participants’ deliberate effort to reconcile different viewpoints and produce a rich, meaningful description of their tacit understanding of squad leader decision making in the fluid battle engagement.

Squad leader decision making is a highly complex task under austere conditions. The stakes are high, and time and space are short. The 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 and force protection measures inherent in the ROE. 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. The squad leader must make a decision whether to engage the enemy in battle in mere seconds. All too often that decision is based on an obscured, imperfect perception of the battlefield.

The resulting EDM cognitive model appears to satisfy each identified factor of concern (see Figure 1). The model presents a near-linear process of the coping mechanisms squad leaders describe employing under the stress of battle and prior to an impending battle engagement.

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 ROE?” The squad leader must decide whether to direct his squad to engage the enemy force, given his mission, commander’s intent, and ROE.

The most critical component of this decision is the enemy threat’s proximity. When the enemy patrol is close enough to present a serious threat to the squad, such as an ambush, then force protection concerns as per the ROE immediately supersede consideration of the mission or commander’s intent. Soldiers retain the basic human right to self-defense.

If the squad leader decides there is no immediate threat from the enemy and that engaging the enemy force does not meet the parameters of his mission or commander’s intent, then a tactical bypass is the best option. The squad leader orders his Soldiers to continue their mission, but observes the enemy and reports the enemy’s position to higher command.

If the squad leader decides that engaging the enemy force is well within his mission and commander’s intent, the matrix then transforms from a cognitive task of triage filtering, to a cognitive task of procedural processing. That is, once the squad leader decides to engage the enemy, he has to decide on a best course of action. Courses of action are addressed by subsequent questions in the EDM cognitive model.

2. “Can I win alone?”

At this point, the squad leader asks, “Can my squad win this battle engagement alone?” The question at hand is whether his squad will be successful if attacked. This decision requires the squad leader to assess the enemy disposition mentally arrayed against his squad’s disposition. Does his squad retain an element of surprise? Does his squad hold advantageous terrain? Does his squad have superior numbers of troops or better weaponry than the enemy?

If the squad leader decides “yes” that he perceives his squad is capable of destroying the enemy force under their current dispositions, then he must direct his squad to attack. After all, the question as to whether an attack is appropriate within the scope of the mission has already been positively established in the first step of the EDM cognitive model. At this point it is entirely appropriate for the squad to attack. The squad leader needs to array his combat power, select a suitable battle drill, and direct his squad in an attack.

If the squad leader decides “no” — that he believes the enemy has a distinct tactical advantage — then he must look for an alternative course of action. That can be addressed in the next question of the EDM cognitive model.

3. “Can I win with help?”

The squad leader now asks, “If I cannot win alone, are there other resources available to me?” If the enemy patrol has a distinct tactical advantage over the friendly squad, can the squad win a battle engagement if they are assisted from a nearby friendly unit or asset?

If the answer is “yes,” then the squad leader must begin coordinating as quickly as possible with that nearby friendly unit or asset to conduct a supported attack against the enemy force.

If the answer is “no,” then the squad leader must again seek another, more viable course of action by asking the next question in the model.

4. “Can I hold what I’ve got?”

The squad leader asks, “Can my squad defend our current position given our present combat power if the enemy conducts an attack?” Here, too, the squad leader must assess the enemy disposition mentally arrayed against his squad’s disposition — particularly the relative combat power of both his own squad and the enemy force. Also germane are terrain considerations of avenues of approach, cover and concealment, observation, key terrain, and obstacles (OCOKA).

If the squad leader decides “yes” his position is defensible, then he arrays his squad into a suitable formation and directs them to establish a defense. This position may present nothing more than a temporary blocking position to fix the enemy force, but such is the nature of defense — defend only long enough to amass combat power and coordinate offensive action.

If the squad leader decides “no” that his position is untenable due to either relative combat power or terrain, then he must direct his squad in a tactical withdraw.

The EDM offers squad leaders cognitive dominance through 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. And the entire process often occurs in just seconds!

Additionally, the EDM cognitive model may transfer across a broader spectrum of situations and battle conditions than earlier cognitive models. The EDM appears 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. Indeed, the EDM may potentially have critical implications as a decision-making model for scholarly academics, political, and business enterprises, plus medical and emergency services.

Limitations & Future Study

Interpretive phenomenological analysis is subjective by nature because the researchers are the instrumentation, and findings are limited to the researchers’ interpretation.²⁴ 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.

Too, 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.²⁵ 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 research team dutifully attempted to represent participants' interpretations of their own experiences, 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 description 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. Yet on the face of it, the findings of this research appear to vindicate the premises of autonomous decision making and mutual trust between commanders and subordinates that are inherent of the mission command philosophy. That is, when commanders trust their squad leaders to make autonomous decisions in battle, the squad leader's willingness to disobey mission orders and make quick decisions on behalf of his commander appears to be the key to cognitive dominance.

Notes

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¹¹ Mundweil, "Overmatch."

¹² Larsen, Lowrance, and Jackson, "Engagement Decision Matrix."

¹³ FM 4-01.45, *Tactical Convoy Operations: Multi-Service Tactics, Techniques, and Procedures* (2005), Figure III-22; FM 3-21.8, *The Infantry Rifle Platoon and Squad* (2007), Appendix J.

¹⁴ Jonathan A. Smith, Maria Jarman, and Mike Osborn, "Doing Interpretative Phenomenological Analysis," in *Qualitative Health Psychology*, ed. Michael Murray et al (London: Sage, 1999); Jonathan A. Smith and Mike Osborn, "Interpretative Phenomenological Analysis," in *Qualitative Psychology: A Practical Guide to Research Methods*, ed. Jonathan A. Smith (London: Sage, 2008).

¹⁵ Jonathan A. Smith, "Reflecting on the Development of Interpretative Phenomenological Analysis and its Contribution to Qualitative Research in Psychology," *Qualitative Research in Psychology* 1 (2004): 39-54.

¹⁶ Katie Reid, Paul Flowers, and Michael Larkin, "Exploring Lived Experience," *The Psychologist* 18/1 (January 2005): 20-23.

¹⁷ Larsen, Lowrance, and Jackson, "Engagement Decision Matrix."

¹⁸ Jonathan A. Smith and Virginia Eatough, "Interpretative Phenomenological Analysis," in *Research Methods in Psychology*, ed. Glynis M. Breakwell et al (London: Sage, 2006).

¹⁹ Joanna M. Brocki and Alison J. Wearden, "A Critical Evaluation of the Use of Interpretative Phenomenological Analysis (IPA) in Health Psychology," *Psychology and Health* 21/1 (2006): 87-108.

²⁰ Michael Larkin, Simon Watts, and Elizabeth Clifton, "Giving Voice and Making Sense in Interpretative Phenomenological Analysis," *Qualitative Research in Psychology* 3/2 (2006): 102-120.

²¹ Larsen, Lowrance, and Jackson, "Engagement Decision Matrix."

²² Ibid.

²³ FM 3-21.8; FM 4-01.45.

²⁴ Smith, Jarman, and Osborn, "Doing Interpretative Phenomenological Analysis."

²⁵ Reid, Flowers, and Larkin, "Exploring Lived Experience."

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