

Technical Report 1186

**Leader Experience and the Identification of
Challenges in a Stability and Support Operation**

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for the Behavioral and Social Sciences**

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LEADER EXPERIENCE AND THE IDENTIFICATION OF CHALLENGES IN A STABILITY AND SUPPORT OPERATION

EXECUTIVE SUMMARY

Research Requirement:

Increasingly, junior officers in the United States Army operate in highly complex environments, requiring them to fulfill multiple roles simultaneously, such as warfighter, peacekeeper, and nation builder. Junior leaders must quickly develop leadership expertise to deal with the current operating environment. This research examines the relationship between military leadership experience and how individuals conceptualize a chaotic and unpredictable operating environment.

Procedure:

Sixteen captains and 25 cadets at the United States Military Academy watched a film depicting a food distribution operation in Afghanistan. Captains and cadets responded to five open-ended questions about the key challenges encountered by the company commander in the scenario, situational variables that impacted the mission, effective and ineffective actions of the commander, and actions that the commander should have done differently. Answers were then content coded to extract themes participants used to conceptualize the scenario. Answers also were scored for thematic emphasis and breadth of coverage across different themes.

Findings:

Results indicated that the scenario could be conceptualized in terms of 21 dimensions. The 21 dimensions could be grouped into four higher-order categories: (1) managing tactical aspects of the task, (2) managing relationships with followers and self-management, (3) situational challenges, and (4) handling the local population and militias. Captains' answers tended to emphasize tactical decision making and managing relationships more strongly than did cadets' answers, and captains' answers also indicated greater integration of multiple higher-order categories than did cadets' answers. However, a surprising finding of this investigation was that captains and cadets did not differ with respect to their emphasis on either situational challenges or how to handle the local population.

Utilization and Dissemination of Findings:

This research sheds light on the differences between novice and experienced leaders in how they think about complex operating environments. This investigation resulted in a framework of 21 dimensions and four higher-order categories that instructors can use to guide students to think about issues that might be overlooked. Additionally, results indicated that captains and cadets did not differ significantly with respect to their cultural understanding of the scenario used in this research, suggesting that instructional interventions to improve cultural knowledge are necessary at both the cadet and captain-level.

LEADER EXPERIENCE AND THE IDENTIFICATION OF CHALLENGES IN A
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LEADER EXPERIENCE AND THE IDENTIFICATION OF CHALLENGES IN A STABILITY AND SUPPORT OPERATION

Introduction

The current operational environment of the United States (U.S.) military is highly complex and ambiguous. Often, junior officers are required to fulfill multiple roles simultaneously, such as warfighter, peacekeeper and nation builder (Wong, 2004). Junior leaders must be able to adjust to the concurrent demands of fighting insurgents while developing collaborative relationships with the local population (Kifner, 2006). Junior leaders may be required to be expert tacticians in one situation and diplomats in the next. Unfortunately, domain-specific or principled knowledge developed to address one aspect of leadership (e.g., battlefield skills) may not generalize to the demands of peacekeeping situations or other types of interpersonal interactions with civilians. Research is necessary that examines how military leaders frame the culturally complex and ill-structured problems commonly encountered in the current operational environment in order to identify strengths and weaknesses in leader conceptualizations. Additionally, research should investigate the role that expertise plays in how Soldiers think about such situations because knowledge of expert-novice differences may suggest ways to accelerate the learning process for inexperienced leaders. This paper explores the impact of military leadership experience on how individuals conceptualize one type of operating environment encountered by officers deployed to the Middle East.

The Distinction between Experts and Novices

Experience plays a key role in the learning and acquisition of job relevant knowledge (Borman, Hanson, Oppler, & Pulakos, 1993; Schmidt, Hunter, & Outerbridge, 1986) and it represents the most prevalent operationalization of expertise (Bedard & Chi, 1993; Cellier, Eyrollr, & Marine, 1997). The impact of expertise, and especially the processes by which experts apply their experience to solving problems, has been researched extensively in many different domains, including decision making and problem solving (Anderson, 2004; Carnahan, Lickeig, Sanders, Durlach, & Lussier, 2004; Hershey, Walsh, Read, & Chulef, 1990; Huber & Wider, 1997; G. Klein, 1993; Zsambock, 1997), game playing (Abernathy, Neal, & Koning, 1994; Saariluoma, 1994; Schneider, Gruber, Gold, & Opwis, 1993), medicine (Dillon & Norcio, 1997; Norman, Brooks, & Allen, 1989), sports (Bedon & Howard, 1992; Deakin & Allard, 1991; Kioumoutzoglou, Michalopoulou, & Deri, 1998), and computer science (Barfield, 1997; Batra & Davis, 1992; Guerin & Matthews, 1990; Paull & Glencross, 1997; Weidenbeck, 1985, 1986).

While experts perform well in their domain of specialization, their expertise does not automatically transfer to other domains (Glaser & Chi, 1988; Voss & Post, 1988). For example, an expert chess player may or may not be able to successfully diagnose a problem with a car engine. To provide a more military-specific example, tactical expertise on the battlefield may not automatically translate to success in interpersonal one-on-one interactions with local civilians. This is because experts tend to rely on methods that work well within their domain of specialization, and these methods may not be applicable to other domains (Johnson, Jamal, &

Berryman, 1991). Specifically, experts are likely to rely on domain-specific assumptions that (1) direct the search for relevant information, (2) act as a foundation for interpreting this information, (3) limit the range of acceptable solutions to a problem, and (4) provide guidelines for solving problems. Thus, when dealing with a problem from a different domain, an expert is more likely to be successful to the extent that the new problem can be solved using knowledge and rules-of-thumb from the expert's domain of specialization.

Experts possess well-developed schema that facilitate pattern recognition (Glaser & Chi, 1988). Although novices may be able to recognize a few elements of a problem, experts can often "intuit" how multiple elements of a problem fit together into a large picture. In some instances, novices do possess the ability to recognize patterns. However, the quality of patterns for experts differs from novices in at least three ways (Cellier et al., 1997). First, experts have a greater number of patterns available in memory. Second, experts are able to include more pieces of information or variables in their patterns. Third, experts recognize more connections or relationships between variables, thereby allowing experts to see the "big picture." Consequently, experts possess a superior understanding of how variables are related to one another, and this knowledge enables experts to extract the overall meaning from several individual pieces of information. Experts can draw inferences from a situation to compensate for missing information, and they know when they need to seek more information to make a decision. Conversely, novices often do not know what information is relevant to solving a problem.

Experts also tend to represent problems at a much deeper and more principled level than do novices (Glaser & Chi, 1988). While experts use principles and abstract concepts to group information, novices group by actual objects or features of a problem. For example, Hardiman, Dufresne, and Mestre (1989) conducted a study in which experts and novices performed a categorization task of 32 physics problems. Subjects were asked to compare 24 problems to eight model problems, which represented certain physics principles that would be used to solve the problem. Correct classification was dependent upon whether the classification matched the principle used to solve the problem (e.g., this set of problems required knowledge about the law of thermodynamics). Results indicated that experts relied on deep structures or meaningful relationships to classify the problems, while novices relied on surface features (e.g., this set of problems involved water). These results suggest that experts possess a deeper and more thorough understanding of principles involved in problem solving, and this deeper understanding facilitates problem solution.

Thus, experts have developed a sophisticated understanding about how variables and concepts are interwoven with one another. In the expert-novice literature, this sophisticated understanding is referred to as knowledge structure (Hardiman et al., 1989), representation of knowledge (Glaser & Chi, 1988), mental models (Hanisch, Kramer, & Hulin, 1991), or schema (Chi, Feltovich, & Glaser, 1981; Davies, 1994; Olsen, 2004). These schema allow experts to perceive large patterns, better understand the nature of a problem, set parameters for problem solving, clearly visualize potential solutions to a problem, comprehend constraints and contingencies associated with potential solutions, and make good decisions (Cellier et al., 1997, Glaser & Chi, 1988; Lord & Hall, 2005; Shanteau, 1992). Experts also use schema to engage in preventive monitoring and to anticipate potential problems before they occur (Cellier et al., 1997).

Experience and Leadership

Research about expertise can be applied specifically to the concept of leadership. Researchers noted that leaders draw from experience to deal with interpersonal and organizational issues (Cianciolo, Antonakis, & Sternberg, 2004; Hedlund, Forsythe, Horvath, Williams, Snook, & Sternberg, 2003) or to make decisions in the context of battle command (Carnahan, et al., 2004; Serfaty, MacMillan, E. E. Entin, & E. B. Entin, 1997). Like “experts” traditionally depicted in the cognitive psychology literature, effective leaders possess complex, well-organized and domain-specific schematic structures of knowledge that allow them to respond flexibly to a large range of situational demands (Streufert & Nogami, 1992; Zaccaro, Gilbert, Thor, & Mumford, 1991). Knowledge representations derived from prior experience and job knowledge are reshaped and reformed as a way to generate new solutions to novel problems (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). Research investigating a cognitive skills-based model of leadership effectiveness found that senior and mid-level military officers demonstrated more complex knowledge representations of their leadership role (as indicated by higher levels of coherence, organization, and principle-based structures) than did less experienced junior officers (Mumford, Marks, Connelly, Zaccaro, & Reiter-Palmon, 2000). Effective leadership can be viewed, therefore, as a form of expertise that includes both a broad response repertoire and the ability to apply this knowledge to the resolution of everyday problems (Day & Lance, 2004). Such findings are consistent with the assumptions of the Leaderplex model of leadership growth and effectiveness (Hooijberg, Hunt, & Dodge, 1997), which views social and cognitive complexity as major determinants of behavioral complexity and leadership effectiveness (Denison, Hooijberg, & Quinnl, 1995). Increased cognitive complexity is defined in terms of the two complementary processes of *differentiation*, referring to the number of dimensions or concepts used in the perception of the social or physical environment, and *integration*, which represents the degree to which individual dimensions can be combined to meet the demands of specific situations (Day & Lance, 2004; Hooijberg et al., 1997).

Given that experts have highly differentiated knowledge structures compared to novices (Day & Lance, 2004; Hooijberg et al., 1997) and cognitive complexity plays an important role in behavioral adaptability (Zaccaro, 1999), experienced leaders are expected to perceive and recognize a broader range of elements (e.g. tactical, interpersonal, and cultural variables) inherent in a situation than are less experienced leaders. Moreover, due to their greater capacity for integrating knowledge principles (Hooijberg et al., 1997), experienced leaders may be more likely to make decisions that take into account the multiple facets of a situation, and this effect may be more pronounced as the complexity and ambiguity in the situation increases. For example, in an exploratory study that investigated differences between experts and novices on a complex command and control task, experts simultaneously considered nine different command considerations (i.e., mission, terrain, situational awareness, enemy, assets, planning, informing, visualizing the battlefield, and the coordination of assets and personnel), while novices considered only six (Carnahan et al., 2004). Specifically, novices failed to discuss planning, visualizing the battlefield in proactive ways, and coordinating assets and resources. Additionally, within the command concern of enemy characteristics, novices primarily focused on the location of the enemy, while experts discussed the location of the enemy, as well as how to identify the enemy and the disposition of the enemy.

Differences between expert and novice performance are most apparent under conditions of complexity and uncertainty (Enis, 1995; Spence, 1996). Situation assessment and problem framing is critical for effective decision making (G. Klein, 1993; Lipshitz, 1993), but novices do not possess the mental models that would allow them to identify and define problems, resolve discrepant information in the environment, recognize gaps in information, and ignore irrelevant information. While much decision making research has noted differences between expert and novice problem solving in complex situations, it is unclear how experienced and novice leaders might differ in their beliefs about appropriate *leadership* actions in conditions of uncertainty. Leadership research suggests that followers have a strong preference for a directive leadership style when confronted with uncertainty and risk. Followers may be willing to forgo their desire to participate in decision making for the promise of a speedy delivery from distressing and uncertain conditions (Bass, 1998; Bass & Riggio, 2006; A. Klein, 1976; Weinberg, 1978). These findings are consistent with normative decision making models (Vroom & Jago, 1988; Vroom & Yetton, 1973) and contingency leadership theories (Fiedler, 1978, Hersey & Blanchard, 1977; House & Mitchell, 1974), which prescribe that leaders should adopt a directive style of leadership to help followers deal with unstructured and complex tasks. Conversely, another line of leadership research proposes that, in complex situations, leaders might wish to obtain input and information from followers (Drath & Palus, 1994). Obtaining input from followers could be particularly advantageous when crisis conditions make it more difficult for leaders to pay attention to all aspects of the situation (Bass & Riggio, 2006; Yukl, 2002). This line of leadership research suggests that a consultative leadership style would be preferable to a directive leadership style in times of stress and uncertainty.

The preference for a specific type of leadership style under conditions of uncertainty may depend on the leader's level of experience. For example, novice leaders with little leadership experience may adopt more of a follower's perspective and focus on the follower's need for guidance under conditions of uncertainty. Experienced leaders, however, may define the problem space differently and focus on things that will enable the leader to make and implement good decisions, such as incorporating the expertise and knowledge of followers. Research is required that investigates how expert and novice military leaders differ with respect to what leadership issues they find salient under conditions of uncertainty.

In sum, experienced leaders are likely to perceive situations and frame problems differently from their novice counterparts, and the ability to properly define the problem space enables experts to make effective decision making (G. Klein, 1993; Lipshitz, 1993). The present investigation explores how commissioned military officers differ from pre-commissioned military cadets in their understanding of a complex operational environment. Unlike earlier research that focused primarily either on tactical or interpersonal aspects of military leadership (Hedlund et al., 2003; Serfaty et al., 1997), the present investigation explores the full range of leadership considerations, including interpersonal, cultural, and tactical actions. This investigation also examines how the perception of uncertainty is related to different assessments of the situation and how those assessments may differ depending on the individual's level of experience.

Method

Participants

Participants were 25 United States Military Academy (USMA) junior and senior-level cadets enrolled in two organizational behavior classes and 16 officers (15 Army captains and one Coast Guard captain) enrolled in a graduate program at USMA. Two of the captains and seven of the cadets were female. Twelve of the 16 captains had deployment experience in Iraq, Afghanistan, or other locations, and the length of deployment ranged from two to 24 months. The average deployment length was 11 months. For most captains, their recent deployment ended immediately prior to joining the graduate program at USMA in June, 2004. For purposes of this exploratory investigation, captains are classified as “experienced” military leaders, while cadets are classified as “novice” military leaders.

Task and Procedure

Officers and cadets watched a video case study called *Power Hungry* and responded to a short questionnaire at the end of the video. The *Power Hungry* case study¹ is a 13-minute film about a character named Captain Young and an Army company tasked with securing a food distribution site in Afghanistan. Captain Young encounters a number of problems, including poor terrain, severe time constraints, faulty communication systems, inexperienced subordinates, local Afghan villagers, and uninvited warlords. Effectively dealing with the situation becomes a complex matter involving tactical, cultural, and interpersonal considerations. The film content is perceived as highly realistic by students (Zbylut & Ward, 2004; Zbylut, Ward, & Mark, 2005) and was based on interviews with officers who had been deployed (Hill, Douglas, Gordon, Pighin, & van Velsen, 2003). Immediately after watching the movie, participants completed a paper-and-pencil questionnaire that contained the following five open-ended questions:

1. What were the key challenges and decisions that Captain Young faced as the operation evolved?
2. What situational factors were likely to impact Captain Young’s ability to succeed?
3. Identify Captain Young’s key effective actions in response to the challenges.
4. Identify Captain Young’s major ineffective actions.
5. What additional actions would you recommend to Captain Young to avoid mission failure?

The Identification of Emergent Themes in the Power Hungry Scenario

Before exploring differences between experienced and novice military leaders, it was important to determine what aspects of the *Power Hungry* scenario participants generally found to be salient. To determine the salient features of the scenario, the first and third authors of this

¹ A text-based version of the *Power Hungry* story can be found in “Think Like a Commander: Excellence in Leadership—Educating Army Leaders with the Power Hungry Film” (Zbylut & Ward, 2004). Copies of this instructor’s manual are available through the Scientific and Technical Information Network at <http://stinet.dtic.mil/str/index.html>. *Power Hungry* was developed as part of a collaboration between the Institute for Creative Technologies and the Army Research Institute.

paper content analyzed participant responses to the five items on the questionnaire. This analysis resulted in 21 dimensions of key actions and situational challenges. The 21 dimensions were then grouped into four higher-order categories based on the judgment of the two authors. The four categories were (1) managing tactical aspects of the task, (2) situational challenges, (3) managing relationships with followers—self-management, and (4) handling local leaders and their militias. The 21 dimensions and the four higher-order categories are presented in Table 1.

The *managing tactical aspects of the task* category reflects tactically-oriented actions that the leader or other Soldiers should have engaged in or engaged in incorrectly during the scenario. These include actions such as decision making and planning, gathering intelligence, positioning troops, and establishing a secure perimeter. The *situational challenges* category includes parameters of the situation that impacted mission success, such as physical conditions (e.g., terrain, heat), resources (e.g. time, people, equipment), and task characteristics (e.g. uncertainty, ambiguity, threat). The *managing relationships with followers--self-management* category reflects actions involving interactions between the leader and his direct followers. The leadership issues included in this category have an interpersonal component such as providing guidance and direction, being respectful and offering supportive communication, and utilizing the advice of followers. This category also includes one dimension that addresses self-management issues, such as managing one's own emotions, adapting to change, and taking responsibility. Dimensions in the *handling local leaders and Afghan militias* category reflect cultural awareness and issues that deal with warlords and their armed militias. While some of these dimensions have tactical (e.g. how to remove the warlords and their groups from the perimeter) or interpersonal (e.g. specific suggestions about negotiation) characteristics, these dimensions all include an element of dealing with the local Afghan population.

Scoring Participant Responses

Once dimensions and broad categories were identified, the researchers then applied the taxonomy to score participant answers. Using the scoring protocol, interrater agreement between the coders ranged from 87% to 100% ($M = 93\%$).

Because more experienced leaders may be likely to identify a greater number of issues in a situation than are novice leaders, the *total number of unique dimensions* cited by each participant across the five questions was counted. Potentially, a participant's score could range from zero to 21 dimensions. The total number of unique dimensions across categories provides an index of differentiation.

Second, within a given category (i.e., tactical, situational challenges, relationships, and handling locals) a more experienced leader is likely to identify more dimensions than a less experienced leader. Thus, the *total number of unique dimensions within each category* was counted for each participant. For the tactical category, potential scores could range from zero to six. For the relationships, situational challenges, and handling locals categories, potential scores could range from zero to five. These measures serve as indices of differentiation within a category.

Table 1
Dimensions and Higher-Order Categories Derived from Content Analysis

Managing Tactical Aspects of The Task

1. Preparation Issues (e.g., gathering intelligence, preparing in advance for the situation, conducting initial assessments and developing a plan and setting priorities)
2. Timely Decision Making and Decision Implementation (e.g., action orientation, exerting control over troops and situation, making decisions, sticking to decisions, taking control of the situation)
3. Positioning/Use of Resources (e.g., perimeter, Soldiers, weapons, general statements about establishing security)
4. NGO Convoy Issues (e.g., establishing communications, route/location, coordination, protection of convoy)
5. Brigade Issues (e.g., asking for brigade support, following brigade intent)
6. Rules of Engagement (e.g., when and to what extent force should be used according to Rules of Engagement)

Situational Challenges

7. Terrain/Physical Setting
8. Personal Experience/Expertise of Leader or Subordinates
9. Resource Constraints (e.g., troops, equipment, communication equipment)
10. Time Constraints
11. Ambiguity and Unpredictability of Situation

Managing Relationships with Followers- Self Management:

12. Involving Soldiers (using team expertise, involving followers in problem solving, delegating responsibilities)
13. Providing Guidance and Direction (e.g. briefing junior officers, ensuring everyone had a common understanding, establishing command authority)
14. Manner and Sufficiency of Communication with Subordinates
15. Other Leadership Style Comments (e.g. bad people skills, did not earn trust)
16. Self-management/Overall Personal Style (e.g. situational awareness, operating under stress, adapting to change, managing temper, taking responsibility)

Handling Locals and Afghan Militias

17. Recognizing Need for Solution with Warlords (e.g., how to maintain peaceful relationships, how to deal with conflict between warlords, who to trust, who to work with).
 18. Specific Suggestions for Negotiated/Peaceful Solutions (e.g. allow warlord to secure area, allow rival clans a cut of the food, allow locals to stay in the area in exchange for not approaching the convoy)
 19. Gaining Control of the Local Nationals in the Perimeter (e.g., how to remove warlords, using force to remove, gaining control over local civilians in perimeter, separating warlords)
 20. Combining Threat of Force with Negotiation Tactics
 21. Unfamiliarity with Culture, History, and Language
-

Third, experience might impact how much emphasis is placed on certain features of a problem or situation. A *dimensional emphasis* score was computed for each participant on each of the 21 dimensions by counting the number of times a participant addressed a particular dimension across the five questions. Thus, the dimensional emphasis score takes into account not only whether a particular dimension was discussed, but how often the participant discussed the dimension across the five questions.

Fourth, more experienced leaders are likely to possess a larger knowledge base than leaders who have substantively less experience. Moreover, experienced leaders may be better able to integrate diverse concepts when assessing a situation than are novice leaders. Within the context of this investigation, the number of different higher-order categories included in a response might be thought of as one indicator of level of integration, which refers to the degree to which conceptual dimensions are combined to address a question or problem. To explore the notion that experienced leaders engage in more integration than novice leaders, a *category breadth score* was calculated for each participant. A category breadth score was computed for each of the open-ended questions by counting the total number of unique categories represented in a participant's answer. An overall category breadth score across the questions also was computed by using the mean score across the five questions. All category breadth scores could range from zero to four. The category breadth scores represent indices of integration.

Results

Number and Type of Dimensions Identified

Because experience is related to differentiation, it was anticipated that officers would report a greater number of total dimensions in their answers than would cadets. An independent samples *t*-test confirmed that officers reported significantly more dimensions ($M = 10.94$ dimensions, $SD = 3.38$) than did cadets ($M = 7.80$ dimensions, $SD = 2.40$), $t(39) = 3.48$, $p < .001$.

Independent samples *t*-tests also were conducted to examine whether officers differed from cadets with respect to how many dimensions they identified within each of the four higher-order categories. Within the *managing tactical aspects* category, officers ($M = 3.81$, $SD = 1.22$) identified more dimensions than did cadets ($M = 2.56$, $SD = 1.26$), $t(39) = 3.30$, $p < .01$. Officers ($M = 2.81$, $SD = 1.11$) also identified more dimensions in the *managing relationships* category than did cadets ($M = 2.00$, $SD = 1.00$), $t(39) = 2.43$, $p < .05$. Although officers also appeared to identify more dimensions related to *situational challenges* and *handling locals* than did cadets, these differences were not statistically significant. These results are reported in Table 2.

Table 2
T-test Results for Indices of Overall Differentiation and Differentiation within Category

Variable	Officers (<i>n</i> = 16)		Cadets (<i>n</i> = 25)		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Total Number of Unique Dimensions	10.94	3.38	7.80	2.40	3.48**	39
Number of Unique <i>Tactical</i> Dimensions	3.81	1.22	2.56	1.26	3.14**	39
Number of Unique <i>Situational</i> Dimensions ^a	2.12	1.78	1.36	0.99	1.57	21.04
Number of Unique <i>Relationships</i> Dimensions	2.81	1.11	2.00	1.00	2.43*	39
Number of Unique <i>Handling Locals</i> Dimensions	2.19	0.83	1.88	0.93	1.08	39

Notes. ** $p < .01$, * $p < .05$

^a Levene's (1960) test for homogeneity of variance indicated that equal variances for this variable should not be assumed. The *t*-test and degrees of freedom have been corrected to address unequal variance. However, *t*-tests for both equal and unequal variances result in similar conclusions about significance.

Dimensional Emphasis

Independent samples *t*-tests were conducted to explore if more experienced leaders differed from novice leaders with respect to how much they emphasized individual dimensions within each category. Table 3 summarizes how officers compared to cadets with respect to how much they emphasized each of the 21 dimensions across the five questions about the scenario.

Within the tactical category, officers ($M = 4.38$ times, $SD = 2.50$) placed much stronger emphasis on *positioning resources* to secure the food distribution site than did cadets ($M = 1.56$ times, $SD = 1.12$), $t(18.91) = 4.24$, $p < .001$. Officers also tended to emphasize the issue of obtaining *brigade support* across the five questions ($M = 1.06$, $SD = 1.34$) more than did cadets ($M = 0.12$ times, $SD = 0.33$), $t(16.18) = 2.76$, $p < .05$. Officers and cadets did not differ with respect to how often they mentioned the other tactical dimensions, however, suggesting that officers and cadets placed a similar amount of emphasis on the remaining four tactical dimensions.

Within the situational challenges category, officers placed a greater emphasis on the *experience of the leader or subordinates* ($M = 0.38$ times, $SD = 0.50$) than did cadets ($M = 0.04$ times, $SD = 0.20$), $t(18.11) = 2.56$, $p < .05$. However, officers and cadets did not significantly differ in emphasis on any of the other situational dimensions.

With regard to the managing relationships category, officers placed significantly stronger emphasis on *providing guidance and direction* ($M = 1.69$, $SD = 1.58$) than did cadets ($M = 0.32$ times, $SD = 0.56$), $t(17.41) = 3.33$, $p < .01$. Although not statistically significant at the $p < .05$ level, two other dimensions in the managing relationships category approached the .05 standard.

Table 3
T-test Results Comparing Officers to Cadets with Respect to Emphasis on Dimensions

	Officers (<i>n</i> = 16)		Cadets (<i>n</i> = 25)		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Preparation Issues ^a	1.25	1.39	0.74	0.94	1.13	24.10
Decision Making and Decision Implementation	1.31	1.20	0.76	1.20	1.44	39
Positioning/Use of Resources ^a	4.38	2.50	1.56	1.12	4.24**	18.91
NGO Convoy Issues ^a	1.81	2.10	0.96	1.17	1.48	21.03
Brigade Issues ^a	1.06	1.34	0.12	0.33	2.76*	16.18
Rules of Engagement ^a	0.44	1.03	0.12	0.33	1.19	17.01
Terrain/Physical Setting ^a	0.63	1.09	0.32	0.48	1.06	18.73
Personal Experience/Expertise of Leader or Subordinates ^a	0.38	0.50	0.04	0.20	2.56*	18.11
Resource Constraints ^a	0.50	0.82	0.16	0.37	1.56	19.09
Time Constraints	0.44	0.63	0.32	0.56	0.61	39
Ambiguity and Unpredictability of Situation	0.94	0.93	0.72	0.74	0.79	39
Involving Soldiers ^a	1.44	1.21	0.76	0.78	1.99 ^b	23.01
Providing Guidance and Direction ^a	1.69	1.58	0.32	0.56	3.33**	17.41
Communication with Subordinates	1.19	1.33	0.56	0.71	1.97 ^c	39
Other Leadership Style Comments	0.50	0.73	0.40	0.71	0.44	39
Self-management/Overall Personal Style	0.38	0.62	0.36	0.64	0.07	39
Recognition of Need for Solution with Local Warlords	2.63	1.89	2.40	1.19	0.47	39
Specific Suggestions for Negotiated/Peaceful Solutions ^a	0.44	1.09	0.00	0.00	1.60	15
Gaining Control of the Locals in the Perimeter	0.81	1.05	0.60	0.76	0.75	39
Combining Threat of Force with Negotiation Tactics	0.06	0.25	0.08	0.28	-0.21	39
Unfamiliarity with Culture	0.69	0.95	0.52	0.77	0.62	39

Notes. * $p < .05$, ** $p < .01$

^a Levene's (1960) test for homogeneity of variance indicated that equal variances for these variables should not be assumed. The *t*-test and degrees of freedom have been corrected to address unequal variance.

^b $p = .058$ when corrected for unequal variances, but was significant at $p = .035$ when not corrected for unequal variances.

^c $p = .056$.

Specifically, officers referenced *involving Soldiers* and gathering their input and expertise ($M = 1.44$ times, $SD = 1.21$) slightly more than did cadets ($M = 0.76$ times, $SD = 0.78$), $t(23.01) = 2.99$, $p = .058$. Additionally, officers referenced *communication with subordinates* ($M = 1.19$ times, $SD = 1.33$) slightly more than did cadets ($M = 0.56$, $SD = 0.71$), $t(39) = 1.97$, $p = .056$. Officers did not differ from cadets with respect to their emphasis on either *leadership style* or *self-management*, however.

With respect to the category of handling the local population, officers and cadets did not differ in their emphasis on any of the five dimensions. This was surprising given that several officers had previous deployment experience, as opposed to cadets who had no deployment experience. Although both cadets and officers appeared to recognize the importance of dealing with the warlords in the scenario ($M = 2.63$ for officers and $M = 2.40$ for cadets), both groups appeared to have very few suggestions as to how to address the problem. Specifically, the participants in this group did not place much emphasis on specific suggestions for negotiated or peaceful solutions, how to gain control of locals who were inside the perimeter, or the possibility of combining the threat of force with negotiation tactics. Another unexpected finding was that very few participants in the group indicated that unfamiliarity with the culture was a problem in this scenario, even though this issue was intentionally built into the scenario and the U.S. Army has reiterated the importance of cultural awareness numerous times in discussions of effective and adaptive leadership.

An examination of the percentages of dimension endorsement for each group of leaders provides another indication that more experienced leaders differ from novices with respect to the dimensions that they emphasize. Table 4 indicates the percentage of respondents, by group, who mentioned a dimension in their answers to the five questions about the scenario. In general, experienced leaders tended to mention more various tactical dimensions than novice leaders. Of note, 100% of experienced leaders mentioned positioning and using resources to secure the food distribution site, as compared to 84% of novice leaders. Additionally, over half of the experienced leaders referred to issues with brigade, as opposed to 12% of cadets. The largest discrepancy between experienced and inexperienced leaders, however, occurred with respect to the issue of providing guidance and direction to subordinates. While 81% of experienced leaders indicated in their answers that the subordinates in the scenario needed more guidance and direction, only 28% of novices included that issue in their answers.

With respect to the handling locals category, a low percentage of officers and no cadets mentioned potential peaceful solutions to the conflict with the warlords. Additionally, officers (6%) and cadets (8%) rarely discussed the potential of combining threat with negotiation as a way to resolve the dispute with the warlords. In general, neither group appeared to view negotiation as a potential solution for the problems embedded in this scenario.

In sum, officers appeared to be more concerned than cadets with security arrangements. Officers also appeared to be more concerned about a wide spectrum of leadership behaviors, including directive (i.e. providing direction), supportive (sufficient and respectful communication), and consultative (utilizing follower input) leadership styles. Officers also placed greater emphasis than cadets on the situational challenge of inexperienced Soldiers, and this aspect of the situation may hold relevance for what leadership behaviors are appropriate for

the situation. However, an unexpected finding was that officers and cadets did not differ with respect to their emphasis on handling the cross-cultural interactions with local warlords.

Table 4
Percentages of How Often Each Dimension Was Mentioned by Officers versus Cadets

	% Officers (<i>n</i> = 16)	% Cadets (<i>n</i> = 25)
Preparation Issues	56	52
Decision Making and Decision Implementation	69	44
Positioning/Use of Resources	100	84
NGO Convoy Issues	69	52
Brigade Issues	56	12
Rules of Engagement	25	12
Terrain/Physical Setting	31	32
Personal Experience/Expertise of Leader or Subordinates	38	4
Resource Constraints	31	16
Time Constraints	38	28
Ambiguity and Unpredictability of Situation	63	56
Involving Soldiers	69	56
Providing Guidance and Direction	81	28
Communication with Subordinates	69	44
Other Leadership Style Comments	38	32
Self-management/Overall Personal Style	31	28
Recognition of Need for Solution with Local Warlords	94	96
Specific Suggestions for Negotiated/Peaceful Solutions	19	0
Gaining Control of the Locals in the Perimeter	50	48
Combining Threat of Force with Negotiation Tactics	6	8
Unfamiliarity with Culture	44	40

Category Breadth

To explore the issue of integration, independent samples *t*-tests were conducted to determine whether officers differed from cadets with respect to the number of unique higher-order categories reflected in their answers. Consistent with expectations, officers' responses reflected greater category breadth (i.e., integration) than cadets on most of the five open-ended questions. Additionally, the overall category breadth score across the five questions was higher for officers ($M = 2.48, SD = 0.51$) than for cadets ($M = 1.82, SD = 0.44$), $t(39) = 4.34, p < .001$. These findings are reported in Table 5.

Table 5
***T*-test Results for Indices of Integration (i.e., Category Breadth)**

	<u>Officers ($n = 16$)</u>		<u>Cadets ($n = 25$)</u>		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Category Breadth: Question 1	2.93	0.85	1.92	0.70	4.16**	39
Category Breadth: Question 2	2.50	0.90	2.00	0.70	1.99 ^b	39
Category Breadth: Question 3 ^a	2.06	1.03	1.37	0.49	2.42*	18.07
Category Breadth: Question 4	2.30	0.80	1.72	0.84	2.24*	39
Category Breadth: Question 5	2.60	0.99	2.00	0.78	2.11*	37
Overall Category Breadth	2.48	0.51	1.82	0.44	4.34**	39

Notes. * $p < .05$, ** $p < .001$

^a Levene's (1960) test for homogeneity of variance indicated that equal variances for this variable should not be assumed. The *t*-test and degrees of freedom have been corrected to address unequal variance. However, tests assuming both equal and unequal variances result in similar conclusions about significance.

^b $p = .054$.

Exploration of Relationships among Dimensions

Results presented earlier in this paper indicated that many differences exist between cadets and officers with respect to how they frame and understand the issues embedded in the scenario used in this investigation. While this scenario was created to represent the complexity and uncertainty often encountered in the twenty-first century operational environment, it should be noted that "uncertainty" can be construed as a largely subjective matter. That is, what is complex and ambiguous to one individual may be simplistic and clear-cut to another individual.

An exploratory series of correlational analyses was performed to examine if an emphasis on uncertainty in the environment had different meaning for experienced leaders versus novice leaders. Looking at correlations permits an examination of whether different patterns of conceptual relationships exist for officers versus cadets. Correlations among variables (number of unique dimensions and dimensional emphasis) are presented in Tables 6 and 7. Correlations were computed separately for cadets (Table 6) and officers (Table 7) in the event that relationships among variables were different for the different groups. Given that the sample sizes were small in both groups, results should be interpreted with extreme caution and are primarily reported here for exploratory purposes and to stimulate future research ideas.

While cadets and officers did not differ on average with respect to how much they emphasized uncertainty in the environment, results suggest that increased emphasis on uncertainty in the environment might hold different meaning for cadets versus officers. Cadets who emphasized uncertainty in the environment also placed more emphasis on preparation issues ($r = .45, p < .05$), rules of engagement ($r = .48, p < .05$), and providing guidance and direction ($r = .43, p < .05$) than did cadets who did not emphasize uncertainty. Each of these three dimensions shares a common theme in that these are factors that can be used to reduce uncertainty in the food distribution mission.

Officers demonstrated a different pattern of relationships for perceived uncertainty. Officers who were concerned about uncertainty in the environment emphasized concerns about leader-follower relationships ($r = .51, p < .05$), dealing with the local Afghans ($r = .53, p < .05$), communicating with subordinates ($r = .71, p < .01$), engaging in self-management behaviors ($r = .62, p < .01$), considering a combination of military threat and negotiation ($r = .59, p < .05$), and unfamiliarity with the Afghan culture ($r = .51, p < .05$). For experienced leaders, it appears that concerns about situational ambiguity are related to a better appreciation for cultural concerns, but this relationship is not evident for inexperienced leaders. Concerns about uncertainty also appear to hold different implications for cadets and officers about what leadership issues are important. While cadets concerned about uncertainty emphasized the role of the leader in providing guidance and direction, experienced leaders concerned about uncertainty emphasized the importance of providing supportive communication to subordinates and managing one's emotions and reactions to the situation. Regardless of the perceived ambiguity of the situation, almost all experienced leaders (i.e., 81%) indicated that the leader should provide more guidance and direction to subordinates.

Table 6
Zero-Order Correlations for Cadets ($n = 25$) for Total Number of Unique Dimensions and Dimensional Emphasis

Number of Unique Dimensions	TotD	UTac	USit	URel	ULoc	D1	D2	D3	D4	D5	D6	D7
Total Unique Dimensions (TotD)												
Unique Tactical Dimensions (UTac)	.78**	--										
Unique Situation Dimensions (USit)	.50*	.26	--									
Unique Relationships Dimensions (URel)	.38	.10	-.20	--								
Unique Handling Locals Dimensions (ULoc)	.57**	.27	.09	.00	--							
D1. Preparation Issues	.20	.40*	-.05	.04	-.03	--						
D2. Decision Making & Implementation	.43*	.39*	.32	.14	.08	.03	--					
D3. Positioning Resources	.40*	.47*	.22	-.18	.35	.07	-.02	--				
D4. NGO Convoy Issues	.54**	.63*	.12	.07	.34	.03	.32	.33	--			
D5. Brigade Issues	.34	.43*	.11	-.12	.32	-.05	-.13	.26	.66**	--		
D6. Rules of Engagement	.34	.33	.24	.12	.05	-.05	-.03	.37	.22	.24	--	
D7. Terrain/Physical Setting	.27	.03	.80**	-.17	-.00	-.04	.50*	-.11	-.12	-.25	.01	--
D8. Expertise of Leader/Subordinates	-.24	-.26	-.07	.00	-.20	-.17	-.13	.27	-.17	-.07	-.07	-.14
D9. Resource Constraints	.36	.24	.29	.00	.30	-.02	.37	.37	.39	.17	.16	.17
D10. Time Constraints	.14	.21	.38	-.22	-.08	-.19	-.00	-.03	.14	.46*	.23	.07
D11. Ambiguity of Situation	.37	.31	.42*	-.05	.13	.45*	-.17	.25	.03	-.03	.48*	.26
D12. Involving Soldiers	.30	.10	-.10	.48*	.24	.04	.38	-.17	.35	.11	-.20	-.12
D13. Providing Guidance/Direction	-.01	.15	-.06	.07	-.24	.28	-.19	.23	.02	.01	.46*	-.24
D14. Communication w/Subordinates	.14	-.13	.29	.06	.17	-.25	.36	.06	.18	-.12	-.30	.31
D15. Other Leadership Style Comments	.10	.02	-.09	.35	-.05	.31	-.13	-.19	-.18	-.04	.14	-.15
D16. Self-management/Personal Style	.13	-.05	-.28	.52**	.15	-.08	.06	-.18	.02	-.21	-.02	-.12
D17. Recognizing Need for Solution with Warlords	.06	.06	.05	.00	.01	-.18	.18	.20	.28	-.02	-.12	.06
D18. Suggestions for Negotiated Solutions	.	.	.	.	.	.	.	.	.	.	.	.
D19. Gaining Control of the Locals in the Perimeter	.70**	.50*	.25	.22	.63**	.11	.16	.42*	.54**	.52**	.36	.14
D20. Combining Threat of Force with Negotiation	.15	.34	-.11	-.15	.20	-.09	.18	-.02	.26	.34	-.11	-.20
D21. Unfamiliarity with Culture	.40*	.12	.07	.11	.67**	-.19	.00	.32	-.02	.07	-.09	-.02

Notes. * $p < .05$, ** $p < .01$

Table 6 (Continued)
Zero-Order Correlations for Cadets ($n = 25$) for Total Number of Unique Dimensions and Dimensional Emphasis

Number of Unique Dimensions	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
Total Unique Dimensions (TotD)													
Unique Tactical Dimensions (UTac)													
Unique Situation Dimensions (USit)													
Unique Relationships Dimensions (URel)													
Unique Handling Locals Dimensions (ULoc)													
<u>Dimensional Emphasis Variables</u>													
D1. Preparation Issues													
D2. Decision Making & Implementation													
D3. Positioning Resources													
D4. NGO Convoy Issues													
D5. Brigade Issues													
D6. Rules of Engagement													
D7. Terrain/Physical Setting													
D8. Expertise of Leader/Subordinates	--												
D9. Resource Constraints	-.09	--											
D10. Time Constraints	-.12	-.05	--										
D11. Ambiguity of Situation	-.20	-.28	-.07	--									
D12. Involving Soldiers	-.20	.28	.18	-.34	--								
D13. Providing Guidance/Direction	.25	-.25	-.07	.43*	-.30	--							
D14. Communication w/Subordinates	.13	.59**	-.15	-.24	.17	-.26	--						
D15. Other Leadership Style Comments	-.12	-.25	.08	.14	.11	-.12	-.30	--					
D16. Self-management/Personal Style	-.12	.07	-.34	-.04	.26	-.10	.09	.41*	--				
D17. Recognizing Need for Solution with Warlords	.28	.13	-.32	-.10	.02	.05	.31	-.34	-.09	--			
D18. Suggestions for Negotiated Solutions													
D19. Gaining Control of the Locals in the Perimeter	-.16	.23	.02	.31	.25	-.08	.04	-.07	.14	-.09	--		
D20. Combining Threat of Force with Negotiation	-.06	-.13	.10	-.09	-.10	-.17	-.02	.04	-.17	.15		-.04	--
D21. Unfamiliarity with Culture	-.14	.42*	-.11	-.10	.08	-.21	.20	-.17	.20	-.10		.37	-.01

Notes. * $p < .05$, ** $p < .01$

Table 7
Zero-Order Correlations for Officers (n = 16) for Total Number of Unique Dimensions and Dimensional Emphasis

Number of Unique Dimensions	TotD	UTac	USit	URel	ULoc	D1	D2	D3	D4	D5	D6	D7
Total Unique Dimensions (TotD)	--											
Unique Tactical Dimensions (UTac)	0.61*	--										
Unique Situation Dimensions (USit)	0.70**	0.07	--									
Unique Relationships Dimensions (URel)	0.60*	0.17	0.15	--								
Unique Handling Locals Dimensions (ULoc)	0.86**	0.62**	0.39	0.55*	--							
<u>Dimensional Emphasis Variables</u>												
D1. Preparation Issues	0.32	0.30	0.39	-0.01	0.01	--						
D2. Decision Making & Implementation	0.32	0.36	-0.02	0.35	0.34	0.07	--					
D3. Positioning Resources	-0.42	-0.04	-0.27	-0.60*	-0.29	-0.20	-0.18	--				
D4. NGO Convoy Issues	-0.10	0.37	-0.45	0.01	0.02	-0.23	-0.21	0.13	--			
D5. Brigade Issues	0.35	0.33	0.25	0.19	0.17	0.35	0.11	0.05	0.00	--		
D6. Rules of Engagement	0.43	0.33	0.44	-0.10	0.44	-0.13	0.21	-0.20	0.10	-0.17	--	
D7. Terrain/Physical Setting	0.57*	0.19	0.85**	-0.01	0.23	0.37	0.20	-0.09	-0.32	0.34	0.39	--
D8. Expertise of Leader/Subordinates	0.29	-0.20	0.69**	0.02	-0.02	0.34	-0.10	-0.12	-0.31	-0.04	0.31	0.52*
D9. Resource Constraints	0.57*	0.23	0.82**	-0.11	0.34	0.29	0.10	-0.03	-0.29	0.27	0.51*	0.90**
D10. Time Constraints	0.70**	0.29	0.78**	0.22	0.47	0.40	0.16	-0.28	-0.24	0.04	0.40	0.74**
D11. Ambiguity of Situation	0.55*	0.11	0.41	0.51*	0.53*	0.27	0.02	-0.25	-0.21	0.16	0.10	0.11
D12. Involving Soldiers	0.64**	0.37	0.50**	0.36	0.51*	0.05	0.50*	-0.19	-0.18	0.27	0.21	0.64**
D13. Providing Guidance/Direction	0.33	-0.07	0.49	0.12	0.25	-0.45	0.02	-0.26	0.04	-0.08	0.66**	0.43
D14. Communication w/Subordinates	0.37	0.06	0.05	0.66**	0.45	0.05	0.34	-0.24	-0.03	0.14	-0.11	0.01
D15. Other Leadership Style Comments	0.07	-0.34	0.00	0.45	0.16	-0.13	-0.04	-0.26	-0.37	-0.10	-0.31	-0.25
D16. Self-management/Personal Style	0.20	0.10	-0.17	0.50*	0.37	0.12	0.46	-0.14	-0.20	-0.03	-0.17	-0.27
D17. Recognizing Need for Solution with Warlords	-0.19	-0.09	-0.12	-0.19	-0.12	-0.29	-0.27	0.27	0.48	-0.28	-0.05	0.02
D18. Suggestions for Negotiated Solutions	0.21	0.12	0.28	0.13	-0.10	0.23	0.30	0.13	-0.22	0.62*	-0.18	0.48
D19. Gaining Control of the Locals in the Perimeter	0.28	0.54*	-0.06	0.08	0.35	0.31	0.37	-0.38	0.19	0.10	0.27	-0.01
D20. Combining Threat of Force with Negotiation	0.40	0.48	-0.02	0.29	0.58*	-0.05	-0.07	-0.04	0.28	0.19	0.15	-0.15
D21. Unfamiliarity with Culture	0.43	0.29	0.42	0.00	0.42	0.22	-0.38	-0.06	0.00	0.02	0.22	0.27

Notes. * $p < .05$, ** $p < .01$

Table 7 (Continued)
Zero-Order Correlations for Officers ($n = 16$) for Total Number of Unique Dimensions and Dimensional Emphasis

Number of Unique Dimensions	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
Total Unique Dimensions (TotD)													
Unique Tactical Dimensions (UTac)													
Unique Situation Dimensions (USit)													
Unique Relationships Dimensions (URel)													
Unique Handling Locals Dimensions (ULoc)													
<u>Dimensional Emphasis Variables</u>													
D1. Preparation Issues													
D2. Decision Making & Implementation													
D3. Positioning Resources													
D4. NGO Convoy Issues													
D5. Brigade Issues													
D6. Rules of Engagement													
D7. Terrain/Physical Setting													
D8. Expertise of Leader/Subordinates	--												
D9. Resource Constraints	0.49	--											
D10. Time Constraints	0.50*	0.58*	--										
D11. Ambiguity of Situation	0.20	0.04	0.39	--									
D12. Involving Soldiers	0.26	0.57*	0.52*	-0.09	--								
D13. Providing Guidance/Direction	0.33	0.44	0.35	-0.11	0.46	--							
D14. Communication w/Subordinates	-0.11	-0.09	0.13	0.71**	0.07	-0.22	--						
D15. Other Leadership Style Comments	-0.18	-0.11	-0.22	0.25	-0.11	-0.14	0.38	--					
D16. Self-management/Personal Style	-0.27	-0.26	-0.11	0.62**	-0.14	-0.42	0.72**	0.44	--				
D17. Recognizing Need for Solution with Warlords	0.02	-0.04	0.03	-0.28	0.19	0.27	-0.13	-0.43	-0.33	--			
D18. Suggestions for Negotiated Solutions	0.17	0.34	0.19	-0.10	0.40	0.08	-0.15	-0.21	-0.06	-0.17	--		
D19. Gaining Control of the Locals in the Perimeter	-0.11	0.04	0.13	-0.15	0.28	-0.08	0.03	-0.13	-0.09	-0.14	-0.33	--	
D20. Combining Threat of Force with Negotiation	-0.20	-0.16	0.24	0.59*	-0.10	-0.12	0.36	-0.18	0.27	-0.09	-0.11	0.05	--
D21. Unfamiliarity with Culture	0.12	0.39	0.24	0.51*	0.01	-0.03	0.26	0.05	0.10	0.08	-0.31	-0.06	0.37

Notes. * $p < .05$, ** $p < .01$

Discussion

This research explored differences between how experienced and inexperienced leaders frame and conceptualize an operational environment. Increasingly, junior military leaders are faced with missions that require the ability to transition rapidly from collaborating with the local population to engaging in high risk operations against hostile forces (Scales, 2006; Wong, 2004). Examining the role of experience in how Soldiers frame their understanding of these types of complex missions can shed light on the emergence of domain-specific leadership expertise relevant to today's operational environment.

Before turning to our broader conclusions, certain limitations of this research should be noted. Although significant differences were found between the two groups of leaders concerning their judgments about the scenario, results should be interpreted with caution due to the small sample size used in this research. A somewhat different pattern of findings may emerge with the inclusion of a larger or different sample (e.g., lieutenant colonels). However, the results were consistent with findings from other studies exploring differences between experts and novices, suggesting that similar patterns of results might emerge with a different sample.

This investigation also employed only one scenario to assess differences in the judgment of officers and cadets. Although this particular scenario is rich in details and realistic in its themes (Zbylut et al., 2005), employing multiple scenarios that depict different styles of leadership in different types of situations would strengthen the generalizability of the findings. Lastly, this research did not include objective or expert-based assessments of the appropriateness of actions and concerns identified by participants, making it difficult to conclude that experienced leaders focused on more relevant aspects of the scenario than did novice leaders. That is, although experienced leaders appeared to identify more elements and have a broader conceptual understanding of the scenario, the veracity of that understanding was not assessed.

Despite these caveats, the results of this research have some noteworthy implications for understanding the development of military leadership expertise for the current operational environment. This research also highlights different patterns of thinking among novice and experienced leaders in the face of uncertain, ambiguous, or unfamiliar situations.

Results indicated 21 dimensions that individuals may use to conceptualize the leadership actions and challenges in stability and support operations. These dimensions appear to belong to four higher-order categories: (1) managing tactical aspects of the task, (2) managing relationships with followers—self-management, (3) situational challenges, and (4) handling the local population and militias. Although this framework was based solely on the scenario used in this research, such a framework might be generalized to other scenarios to test Soldiers' understanding of complex military environments. Additionally, such a framework could be used to help novices (e.g., USMA cadets, Reserve Officers Training Corps, and second lieutenants) think systematically about situations and scenarios that they encounter during the educational process.

Consistent with previous research on expertise (Glaser & Chi, 1988; Shanteau, 1992) and leadership (Day & Lance, 2004; Hooijberg et al., 1997; Lord & Hall, 2006; Mumford et al., 2000), experienced leaders identified significantly more elements or dimensions of the scenario than did novice-level cadets. With respect to specific categories of dimensions, experienced leaders identified a greater number of tactical concerns than cadets, as well as a greater number of concerns about managing relationships and managing the self. Captains placed a stronger emphasis than cadets on the specific issues of decision making and implementation, positioning and using resources, communicating with brigade headquarters, taking into account the level of expertise of subordinates, and the importance of providing guidance and direction. These findings suggest that captains engage in more differentiation than do cadets, and are able to perceive many more issues than cadets when confronted with a complex situation.

Results also indicated that captains tended to construct answers that tapped a larger number of higher level categories than did cadets. That is, captains appeared to do a better job at composing answers that integrated diverse concepts than did cadets. Thus, the experienced leaders appeared to be superior to cadets on indices of both differentiation and integration, and appeared to understand the scenario using a slightly more sophisticated schema.

In a similar vein, Carnahan et al. (2004) found evidence that experts engaged in greater differentiation and integration than novices while dealing with a dynamic, but more traditional, battle scenario. Like the results of the present investigation, experts in the Carnahan experiment were more tactically knowledgeable than novices. Experts were able to better integrate diverse command concepts in their decision making process and showed fine distinctions in their thinking about specific topic areas, like understanding the enemy. Unlike the present investigation, however, the Carnahan work found that novices had poor situational awareness compared to experts. This discrepancy could be due to several factors. First, while the novices in the Carnahan research also were USMA cadets, the expert group consisted of lieutenant colonels. The situational awareness of lieutenant colonels may be superior to the captains in the present investigation due to longer exposure to the military. Second, the scenario employed in the Carnahan investigation was a battle scenario, which might be more familiar to military professionals than scenarios dealing with stability and support operations; this familiarity may improve the likelihood of situational awareness for the expert group. Third, the sample size in the current investigation might not be large enough to detect significant differences between cadets and captains, but these differences could become evident with the inclusion of additional research participants.

Regardless of discrepancies between the current investigation and the Carnahan et al. (2004) work, one practical implication of both lines of research is that experienced leaders differ from novice leaders with respect to what they emphasize. Instructors can use information about specific expert-novice differences to help novice leaders think more like experts (Shadrack & Lussier, 2004). The results of the current investigation suggest that instructors who want to help novice trainees understand a complex mission, like a stability and support operation, might consider framing the discussion along four dimensions—tactical concerns, situational factors, leadership concerns, and cultural considerations. Moreover, to assist novices in thinking like their more experienced counterparts, instructors may need to spend time focusing on areas in which novices did not excel—positioning and using resources, issues in dealing with brigade or

higher, considering the various areas of expertise of team members, and providing guidance and direction to subordinates.

Given that captains appeared superior to cadets in terms of knowledge about tactical and relationship issues, it was surprising that captains and cadets performed similarly with respect to situational challenges and handling the local population. These results were particularly unexpected given that many of the officers had returned from deployments to the Middle East. One possible explanation for these findings is that, although captains have had more experience with the military and deployment in general, the officers who participated in this research may have only had limited exposure to the specific type of situation depicted in the film. That is, although the captains may have been deployed to the Middle East, they may not have had interactions with warlords or been involved in food distribution operations. Thus, the captains might not be more “expert” than cadets with respect to the cultural and situational variables in the scenario used to conduct this research. What might be of greater concern, however, is the possibility that the captains who participated in this research think about cultural issues in much the same way as cadets do. Such thinking may be the result of deficits in either the tacit knowledge gained through experience or formal training of cultural issues. Hedlund and colleagues (2003), for example, suggested that experienced-based, tacit knowledge is a form of procedural knowledge that complements formal training by indicating what leadership methods may be most effective for different types of situations. Expertise likely results from a combination of formalized training and experience garnered across multiple situations. While it is likely that the officers who participated in this investigation have been exposed to military doctrine and extensive training concerning tactical decisions, there may be limited training available for preparing leaders to handle the complicated job of integrating tactical and security concerns with cross-cultural and nation-building tasks (Ben-Yoav Nobel, Wortinger, & Fuchs, 2006; Scales, 2006; Wong, 2005). In sum, officers may not have had adequate opportunity to integrate hands-on experience with knowledge acquired in systematic instruction, resulting in non-significant differences between their level of expertise and that of cadets. Additional research is needed to assess the combined effect of personal exposure to cross-cultural/nation-building missions and pre-deployment training on the development of leadership expertise relevant for handling such tasks.

Although both officers and cadets recognized that dealing with the warlords was important, very few individuals in this investigation mentioned the possibility of crafting a peaceful solution to the conflict or expressed a desire to pursue negotiation for resolving problems embedded in the scenario. Thus, it might be that negotiation and peaceful solutions were either not seen as viable approaches to resolving the disputes in the scenario or that both officers and cadets lacked the knowledge that would help them consider the application of such approaches for handling the situation. Instead, answers primarily focused on tactical approaches to dealing with both the local civilians and the warlords (e.g., remove locals from the perimeter). A potential implication of this finding is that, in situations of threat and risk, Soldiers may readily think of tactical solutions for which they have been well-trained, but are less able to think of alternative solutions that are non-tactical and, therefore, unfamiliar. Research that examined the interactions between Israeli Soldiers and Palestinian civilians supports the idea that Soldiers rely on practices that they are familiar with, even if it is not the optimal course of action (Veiner & Shazberg, 2005). In operating checkpoints, Israeli Soldiers who were confronted with

ambiguity and vague rules about handling Palestinian civilians' needs and requests tended to rely on well-established and familiar hierarchical military communication and patterns of interaction, leading to reactions of resentment and hostility on the part of the civilians.

Developing peaceful solutions through negotiations is likely to help Soldiers foster collaborative relationships with members of the local population as a way to achieve both "winning hearts and minds" and obtaining necessary local support (e.g. intelligence) to ensure mission success (Ben-Yoav Nobel et al., 2006; Goodwin, 2005). Cross-cultural negotiation skills and the use of negotiation combined with war fighting are central developmental areas for preparing troops to conduct stability and support operations in hostile environments. Providing Soldiers with the appropriate skill set that best fit the demands of interacting with local civilians is important to ensure mission success. Given that very few of the individuals in this research considered negotiation and other non-tactical approaches to dealing with the problems embedded in this scenario, individuals involved in the education and training of junior officers should explore whether their curricula should include instructional objectives that target how leaders can leverage cultural knowledge to diffuse situations.

Although cadets and officers did not differ on average with respect to their emphasis on ambiguity, the results suggest that cadets and officers are concerned with different issues when they perceive that the environment is unpredictable. Specifically, cadets who were concerned with unpredictability also tended to stress that the leader needed to provide guidance to subordinates and subordinates needed a clear understanding of the rules of engagement. This finding is consistent with followers' preference for direction when confronted with uncertainty (Bass, 1998; Bass & Riggio, 2006; A. Klein, 1976; Weinberg, 1978). Conversely, almost all officers (i.e., 81%) believed that it was important for the leader to provide more guidance, regardless of whether they reported concern with the unpredictability of the environment. Instead, officer perceptions of ambiguity were related to issues of emotional self-control and the communication style (particularly supportive communication) used with subordinates. Future research should explore the potential moderating effect of leadership experience on the relationship between perceptions of uncertainty and the preference for consultative, directive, or supportive leadership behaviors.

REFERENCES

- Abernathy, B., Neal, R. J., & Koning, P. (1994). Visual-perceptual and cognitive differences between expert, intermediate, and novice snooker players. *Applied Cognitive Psychology, 8*, 185-211.
- Anderson, P. (2004). Does experience matter in lending? A process-tracing study on experienced loan officers' and novices' decision behavior. *Journal of Economics and Psychology, 471-492*.
- Barfield, W. (1997). Skilled performance on software as a function of domain expertise and program organization. *Perceptual and Motor Skills, 85*, 1471-1480.
- Bass, B. M. (1998). *Transformational leadership*. Mahwah, NJ: Erlbaum.
- Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd Ed.). Mahwah, NJ: Erlbaum.
- Batra, D., & Davis, J. G. (1992). Conceptual data modeling in database design: similarities and differences between expert and novice designers. *International Journal of Man-Machine Studies, 37*, 83-101.
- Bedard, J., & Chi, M. T. H. (1993). Expertise in auditing. *Auditing: A Journal of Practice and Theory, 12*, 21-45.
- Bedon, B. G., & Howard, D. V. (1992). Memory for the frequency of occurrence of karate techniques: A comparison of experts and novices. *Bulletin of the Psychonomic Society, 30*, 117-119.
- Ben-Yoav Nobel, O., Wortinger, B., & Fuchs, D. (2006, March). Solider-negotiator: The impact of perceived Iraqis' power and trust on the negotiation between US military officers and Iraqi civilians. Paper presented at the APA Division 21 & 19 Annual Symposium on Applied Experimental Research, Fairfax, VA.
- Borman, W. C., Hanson, M. A., Oppler, S. H., & Pulakos, E. D. (1993). Role of supervisory experience in supervisory performance. *Journal of Applied Psychology, 78*, 443-449.
- Carnahan, T. J., Lickteig, C. W., Sanders, W. R., Durlach, P. J., & Lussier, J. W. (2004). *Novice versus expert command groups: Preliminary findings and training implications for future combat systems*. (ARI Research Report 1821). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Cellier, J. M., Eyrollr, H., & Marine, C. (1997). Expertise in dynamic environments. *Ergonomics, 40*(1), 28-50.

- Chi, M., Feltovich, P., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. *Cognitive Science*, 5, 121-152.
- Cianciolo, A.T., Antonakis, J., & Sternberg, R. J. (2004). Practical intelligence and leadership: using experience as a “mentor.” In D. V. Day, S. J. Zaccaro, S. M. Halpin (Eds.), *Leader development for transforming organizations* (pp. 211-236). Mahwah, NJ: Earlbaum.
- Davies, S. P. (1994). Knowledge restructuring and the acquisition of programming expertise. *International Journal of Human-Computer Studies*, 40, 703-726.
- Day, D. V., & Lance, C. E. (2004). Understanding the development of leadership complexity through latent growth modeling. In D. V. Day, S. J. Zaccaro, S. M. Halpin (Eds.), *Leader development for transforming organizations* (pp. 41-69). Mahwah, NJ: Earlbaum.
- Deakin, J. M., & Allard, F. (1991). Skilled memory in expert figure skaters. *Memory & Cognition*, 19, 79-86.
- Denison, D. R., Hooijberg, R., & Quinn, R. E. (1995). Paradox and performance: Toward a theory of behavioral complexity in managerial leadership. *Organization Science*, 6, 524-540.
- Dillon, T. W., & Norcio, A. F. (1997). User performance and acceptance of a speech-input interface in a health assessment task. *International Journal of Human-Computer Studies*, 47, 591-602.
- Drath, W. H., & Palus, C. J. (1994). *Making common sense: Leadership as meaning-making in a community of practice*. Greensboro, NC: Center for Creative Leadership.
- Enis, C. R. (1995). Expert-novice judgments and new cue sets: Process versus outcome. *Journal of Economic Psychology*, 16, 641-662.
- Fiedler, F. E. (1978). The contingency model and the dynamics of the leadership process. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 59-112). New York: Academic Press.
- Glaser, R., & Chi, T. H. (1988). Overview. In T.H. Chi, Glaser, R. & M.J. Farr (eds.), *The nature of expertise*, Hillside, NJ: Erlbaum.
- Goodwin, D. (2005). *The military and negotiation*. London: Frank Cass.
- Guerin, B., & Matthews, A. (1990). The effects of semantic complexity on expert and novice computer program recall and comprehension. *The Journal of General Psychology*, 117, 379-389.

- Hanisch, K. A., Kramer, A. F., & Hulin, C. L. (1991). Cognitive representations, control, and understanding of complex systems: A field study focusing on components of users' mental models and expert/novice differences. *Ergonomics*, 8, 1129-1145.
- Hardiman, P. T., Dufresne, R., & Mestre, J. P. (1989). The relation between problem categorization and problem solving among experts and novices. *Memory and Cognition*, 17, 627-628.
- Hedlund, J., Forsythe, G. B., Horvath, J. A., Williams, W. M., Snook, S., & Sternberg, R. J. (2003). Identifying and assessing tacit knowledge: Understanding the practical intelligence of military leaders. *Leadership Quarterly*, 14, 117-140.
- Hersey, P., & Blanchard, K. H. (1977). *The management of organizational behavior* (3rd Ed.). Englewood Cliff, NJ: Prentice Hall.
- Hershey, D. A., Walsh, D. A., Read, S. J., & Chulef, A. S. (1990). The effects of expertise on financial problem solving: Evidence for goal-directed, problem-solving scripts. *Organizational Behavior and Human Decision Processes*, 46, 77-101.
- Hill R., Douglas, J., Gordon, A., Pighin, F., & van Velsen, M. (2003, August). Guided conversations about leadership: Mentoring with movies and interactive characters. Proceedings of the Fifteenth Innovative Applications of Artificial Intelligence Conference (IAAI-03), Acapulco, Mexico.
- Hooijberg, R., Hunt, J. G., & Dodge, G. E. (1997). Leadership complexity and the development of the Leaderplex model. *Journal of Management*, 23, 375-408.
- House, R. J., & Mitchell, T. T. (1974). Path-goal theory of leadership. *Journal of Contemporary Business*, 4(3), 81-98.
- Huber, O., & Wider, R. (1997). Active information search and complete information presentation in naturalistic risky decision tasks, *Acta Psychologica*. 95(1), pp 15-29.
- Johnson, P. E., Jamal, K., & Berryman, R. G. (1991). Effects of framing on auditor decisions. *Organizational Behavior and Human Decision Processes*, 50, 75-105.
- Kifner J. (2006, February 16). Tough G.I.'s go to war armed with Afghan ABC's. pp. A1, B6.
- Kioumourtzoglou, E., Michalopoulou, M., & Derri, V. (1998). Differences in several perceptual abilities between experts and novices in basketball, volleyball, and water-polo. *Perceptual and Motor Skills*, 86, 899-912.
- Klein, A. L. (1976). Changes in leadership appraisal as a function of stress of a simulated panic situation. *Journal of Personality and Social Psychology*, 34, 1143-1154.

- Klein, G. (1993). Twenty questions: Suggestions for research in naturalistic decision making. In G. A. Klein, J. Oransanu, R. Calderwood, and C. E. Zsombok (Eds.), *Decision making in action: Models and methods* (pp. 389-403). Norwood, NJ: Ablex Publishing Corporation.
- Lipshitz, R. (1993). Decision-making as argument-driven action. In G. A. Klein, J. Oransanu, R. Calderwood, and C. E. Zsombok (Eds.), *Decision making in action: Models and methods* (pp. 158-171). Norwood, NJ: Ablex Publishing Corporation.
- Lord, R. G., & Hall, R. J. (2006). Identity, deep structure and the development of leadership skill. *Leadership Quarterly*, *16*, 591-615.
- Mumford, M. D., Marks, M. A., Connelly, M. S., Zaccaro, S. J., & Reiter-Palmon, R. (2000). Development of leadership skills: Experience and timing. *Leadership Quarterly*, *11*(1), 87-114.
- Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, O. T., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *Leadership Quarterly*, *11*(1), 11-35.
- Norman, G. R., Brooks, L. R., & Allen, S. W. (1989). Recall as medical practitioners and novices as a record of processing attention. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *15*, 1166-1174.
- Olsen, R.A. (2004). Professional investors as naturalistic decision makers: Evidence and market implications. *The Journal of Psychology and Financial Markets*, *3*(3), 161-167.
- Paull, G., & Glencross, D. (1997). Expert perception and decision making in baseball. *International Journal of Sport Psychology*, *28*, 35-56.
- Saariluoma, P. (1994). Location coding in chess. *The Quarterly Journal of Experimental Psychology*, *47*, 607-630.
- Scales, R. H. (2006, January-February). The second learning revolution. *Military Review*, 37-44.
- Schmidt, F. L., Hunter, J. E., & Outerbridge, A. N. (1986). The impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job performance. *Journal of Applied Psychology*, *7*, 431-439.
- Schneider, W., Gruber, H., Gold, A., & Opwis, K. (1993). Chess expertise and memory for chess positions in children and adults. *Journal of Experimental Child Psychology*, *56*, 328-349.
- Serfaty, D., MacMillan, J., Entin, E. E., & Entin, E. B. (1997). The decision expertise of battle commanders. In C.E. Zsombok & G. Klein (Eds.). *Naturalistic decision making* (pp. 233-246). Mahwah, NJ: Lawrence Erlbaum Associates.

- Shadrick, S. B., & Lussier, J. W. (2004). *Assessment of the Think Like a Commander training program*. (ARI Research Report 1824). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Shanteau, J. (1992). How much information does an expert use? Is it relevant? *Acta Psychologica, 81*, 75-86.
- Spence, M. T. (1996). Problem-problem solver characteristics affecting the calibration of judgments. *Organizational Behavior and Human Decision Processes, 3*, 271-279.
- Streufert, S., & Nogami, G. (1992). Cognitive complexity and team decision making, In R. W. Swezey & E. Salas (Eds.). *Teams: Their training and performance* (pp. 127-151). Norwood NJ: Ablex.
- Veiner, A., & Shazberg, R. (2005). Organizing the operation of check points by the Israeli Defense Forces in Judea and Samaria. *Journal of Military Psychology* (Hebrew), *4*.
- Voss, J., & Post, T. (1988). On the solving of ill-structured problems. In T. H. Chi, R. Glaser & M. J. Farr (Eds.). *The nature of expertise* (pp. 261-285). Hillsdale, NJ: Erlbaum.
- Vroom, V. H., & Jago, A. (1988). *The new leadership: Managing participation in organizations*. Englewood Cliff, NJ: Prentice Hall.
- Vroom, V. H., & Yetton, P. N. (1973). *Leadership decision making*. Pittsburg, PA: University of Pittsburg Press.
- Weidenbeck, S. (1985). Novice/expert differences in programming skills. *International Journal of Man-Machine Studies, 23*, 383-390.
- Weidenbeck, S. (1986). Organization of programming knowledge of novices and experts. *Journal of the American Society for Information Science, 37*(5), 294-299.
- Weinberg, S. B. (1978). A predictive model of group panic behavior. *Journal of Applied Communication Research, 6*, 1-9.
- Wong, L. (2004, September). Developing adaptive leaders: The crucible experience of Operation Iraqi Freedom. *Strategic Studies Institute Newsletter of the US Army War College*, 1-23.
- Yukl, G. (2002). *Leadership in organizations* (5th Ed.). Upper Saddle River, NJ: Prentice-Hall.
- Zaccaro, S. J., Gilbert, J. A., Thor, K. K., & Mumford, M. D. (1991). Leadership and social intelligence: Linking social perceptiveness to behavioral flexibility. *Leadership Quarterly, 2*, 317-347.

- Zaccaro, S.J. (1999). Social complexity and the competencies required for effective military leadership. In J. G. Hunt, G. E. Dodge, & L. Wong (Eds.). *Out of the box leadership: Transforming the Twenty-First Century Army and other top performing organizations* (pp. 131-151). Stanford, CT: JAI Press.
- Zbylut, M. L., & Ward, J. N. (2004, December). Developing interpersonal abilities with interactive vignettes. Poster presented at the 24th Army Science Conference, Orlando, FL.
- Zbylut, M. L., & Ward, J. N., (2004). *Think Like a Commander—Excellence in Leadership: Educating Army leaders with the Power Hungry film*. (ARI Research Product 2004-01). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Zbylut, M. L., Ward, J. N., & Mark, J. D. (2005, April). Constructivism in training: A comparison of two interactive training tools. Poster presented at the 20th annual conference for the Society of Industrial/Organizational Psychologists, Los Angeles, CA.
- Zsambock, C. E. (1997). Naturalistic decision making: Where are we now? In C.E. Zsambock & G. Klein (Eds.), *Naturalistic decision making* (pp. 3-16). Mahwah, NJ: Erlbaum.