

SURVIVING THE ADVENTURE OF A LIFETIME

By Jack Stuster and Zail Coffman

Statistics in a detailed new combat study show that the first few firefights make all the difference.

More than 2,500 U.S. military personnel have died in firefights in Iraq and Afghanistan, nearly as many as killed by improvised explosive device (IED) attacks. We recently completed an investigation validating the widely held belief that soldiers and Marines surviving their first few

firefights have increased long-term survivability in later, prolonged exposure to combat.¹ The study also identified the underlying factors and behaviors that contribute to casualties and survival. Identification of factors amenable to explicit training of individuals and groups has motivated consideration of these issues since the first armies were formed.

This intention guided our research, which used methods that have proved useful in a broad range of previous studies concerning skills, training, organization, equipment, communications, procedures, and behavior.

The study found survivability and mission outcomes are improved by previous firefight experience, quantified those



enhancements, and characterized some of the underlying overt and tacit knowledge of veteran individuals and groups. Other issues associated with doctrine, operational arts, tactics, and equipment relevant to combat performance also were identified.

One aspect of the research involved analysis of interviews with highly experienced veterans and of email responses to queries posted on the Battle Command Knowledge System website. Most of the respondents were senior noncommissioned officers but also included commissioned veterans. A novel aspect of the project involved content analysis of published and archival accounts of firefights to study factors identified by subject-matter experts and the investigators as potentially relevant to the primary research questions.

Performance in the Field

Combat historian S. L. A. Marshall's comments concerning World War II battlefield performance are relevant to our study, particularly his assertion that only 15 to 25 percent of those in battle actually fired their weapons.² Marshall's assertions concerning ratios of fire have been challenged, but they led directly to changes in doctrine, training, and weapons.³ The higher ratios of fire among U.S. servicemen during the Korean and Vietnam wars were attributed to changes implemented in response to Marshall's estimates.

Marshall is best remembered for his dubious ratio of fire, but the accomplishment of which he was proudest was the method he developed to better understand human performance in combat—informal, open-ended group interviews of enlisted personnel, conducted as soon as possible following battle. We assumed that the practice of conducting after-action reviews had continued as a legacy of Marshall's influence. However, we discovered that most incidents are undocumented by practitioners reviewing their own units' tactical performance. The lessons from those reviews only propagate slowly as war stories, that ancient and primarily oral tradition that still serves as a conduit for knowledge among both veterans and novices.

War as a subject of storytellers precedes the invention of writing in the form of epic poems that were sung at banquets and ceremonies and rendered as pictographs and decorative art. War stories later were recorded in cuneiform on clay tablets, then on parchment scrolls, and eventually by movable type. Stories about war are civilization's earliest forms of literature and have inspired and instructed through the ages. The current conflicts have generated exceptional numbers of first-person accounts. Among the best is Nathaniel

Fick's *One Bullet Away: The Making of a Marine Officer*. Fick wrote:

The telling and retelling are important. Platoons have institutional memory. They learn, and they change. Most of that learning happens after a firefight. Some officers squelched the stories, considering them unprofessional and distracting. I encouraged them, as psychological unburdening and as improvised classrooms where we sharpened our blades for the next fight.⁴

We assembled a database of published and archival accounts of firefights to enable the study of factors identified by combat veterans and the investigators as potentially relevant to the research. At least one member of the friendly force was killed in action (KIA) in more than 30 percent of the firefights contained in our database, and friendly-force casualties (injuries and/or KIA) occurred in 64 percent of the total. We know that a larger proportion of firefights occur without friendly-force casualties than is represented in our database, because many of the accounts refer to preceding and/or subsequent engagements that are not described in the narrative, with no mention of casualties. It is not our intention to imply that the experiences comprised by the database are representative of all firefights, but rather, only those engagements that were sufficiently noteworthy to be described in detail for posterity.

Weighing the Factors

A matrix was constructed with rows for individual engagements and columns for identifying information, the theater of operations, protagonists, dates, locations, source documents, and variables. Variables include force sizes, missions, weapons, ammunition, equipment, support available, time of initiation, duration, terrain, weather, visibility, human-terrain constraints, and others. Assessments of communications, physical and mental condition, personal and unit preparation/training, intelligence, and rules-of-engagement were described and/or assigned numerical ratings to reflect the variables' influences on the firefights, as were environmental factors and mission outcomes. Casualties were recorded and causal factors of own-forces casualties, survival factors, lessons learned, weapons fired, and commentary notes were added to each record, which included a total of 88 data fields.

More than 30 volumes of nonfiction provided cases to our database of firefights; authors include private soldiers, NCOs, platoon leaders, senior commanders, embedded journalists, and historians. Other sources included magazine articles, after-action reports, and accounts discovered in the archives of the Army and Marine Corps Centers for Lessons Learned.

More than 400 combat narratives were reviewed during this phase of the project, but only those containing sufficient detail to permit a reasonable analysis consistent with our objectives were selected for inclusion. The

U.S. ARMY (CAMERON BOYD)

In the thick of it: Soldiers of the 101st Airborne Division shoot back at Taliban forces during a firefight in Afghanistan's Barawala Kalay Valley in March 2011. The authors' recently completed investigation validates the belief that "soldiers and Marines surviving their first few firefights have increased long-term survivability in later, prolonged exposure to combat."

most important criterion was an indication of previous firefight experience.

Two hundred and eight firefight accounts are contained in the database. Cases range from 1966 to 2009 and include engagements drawn from U.S. Army, Marine Corps, and Naval Special Warfare experience, and several examples that describe actions involving coalition partners; the database also includes accounts from the Soviet-Mujahideen war in Afghanistan.⁵ The collection is not exhaustive, but accurately characterizes the tactical engagements fought in Vietnam, Iraq, and Afghanistan. Our interpretations and evaluations of the stories follow a myriad of inter-related martial and literary determinations by the authors, publishers, and editors of the accounts; however, we believe their intentions and competencies support our objectives.

Casualties

All casualties, killed-in-action and wounded-in-action, were counted as a loss of force strength in calculation of survival ratios (force size after combat divided by initial force size, an inverse casualty ratio). Survival rates were chosen as an analytic measure rather than casualty rates to better reflect the purpose of the research.

Overall, the database's 208 firefights had an average survival ratio of 90 percent; 64 percent of firefights in the database had casualties and an average force-survival ratio of 84 percent. Indigenous allied forces fighting under Western-force leadership were incorporated in statistical treatments whenever the chroniclers specifically included them in the narrations' discussions of force strength, casualties, experience, and other pertinent analytic measures. U.S. and allied units in Iraq and Afghanistan with three or fewer previous firefights were involved in 46 percent of the encounters and sustained 68 percent of the 982 casualties in the database.

Of the 72 firefights from Afghanistan, 56 percent had Western-force casualties. The Soviets' overall firefight-survival ratio of 96 percent is higher than the U.S./Canadian 90 percent, but differences between Soviet and North American doctrines and tactics make direct comparisons problematic. Alliance forces in the 116 firefights in the database from Iraq had an overall survival ratio of 90 percent; 70 percent had casualties and an average survival ratio of 85 percent. Units in their third or fourth firefights had the lowest survival ratios: U.S. and allied units in Afghanistan with 66 percent and in Iraq with 74 percent. Units in their first and second firefights had high survival rates but were generally ineffective at engaging their adversaries.

Special-operations forces (SOFs) accounted for 24 percent of the database with an average firefight-survival rate

SUMMARY CHARACTERIZATION OF THE FIREFIGHT DATABASE

Category	Number of Cases	Percent of Total
Special Operations Forces*	49	24%
Non-Special Operations Forces	159	76%
Own-Force Casualties	134	64%
No Own-Force Casualties	74	36%
Vietnam	20	10%
Afghanistan	72	34%
Iraq	116	56%
U.S. Army	71	34%
U.S. Marines	61	29%
U.S. Navy	24	12%
Soviet Army	43	21%
Canadian Army	5	2%
British Army	2	1%
Italian Army	2	1%
0 Previous Firefights	32	15%
1 Previous Firefight	18	9%
2 Previous Firefights	19	9%
3 Previous Firefights	17	8%
4 Previous Firefights	19	9%
0-4 Previous Firefights	105	51%
5 or More Previous Firefights	103	49%

*Includes Special Forces, Airborne, Rangers, SEALs, Recon, Snipers, and Spetznaz.

of 86 percent; 59 percent of their firefights had own-force casualties. Conventional (non-SOF) forces had own-force casualties in 41 percent of their firefights in the database.

Experience and Outcomes

Nineteen percent of the 165 U.S. and allied cases had no previous firefight experience, although some had encountered sniping, indirect fire, mines, or IEDs before their initial exchanges of fire with enemy forces. U.S. and allied forces had an average previous experience of 6.9 firefights and a median of 4.

Units in the 208 firefights included in the database were evaluated for accomplishment of assigned missions using a five-point numeric scale. While leaders of the engaged units likely would rate their success higher, evaluations were based on the textual accounts, which consistently described mission objectives and commanders' intentions. It is not surprising that the analysis showed smaller units to be less able to take casualties and achieve mission success than larger units. The abilities of units sustaining casualties to accomplish assignments are degraded, but their levels of prior combat experience are more accurate predictors of mission success than are casualty measures.

Smaller units were found to be more successful than larger ones in Afghanistan, as were SOFs, while larger

units had higher mission-success ratings in Iraq. Likewise, the success ratings of platoons and smaller units improved more with experience than did the ratings of larger formations.

The graph below illustrates the relationships among previous firefight experience, survival rate, and mission-outcome ratings. It shows that mission outcome improves dramatically during units' fourth firefight (i.e., three previous firefights), while survival rate improves during the fifth engagement (i.e., four previous firefights). All subsets of the data (e.g., U.S., U.S. and allies, Afghanistan, Iraq, SOF, non-SOF) produced similar results, with both measures trending upward with combat experience after the third and fourth firefights. The subsequent dips in these measures might be explained by the assignment of increasingly difficult missions to experienced units, complacency, or the effects of some other factor on unit performance.

Operational and Environmental Variables

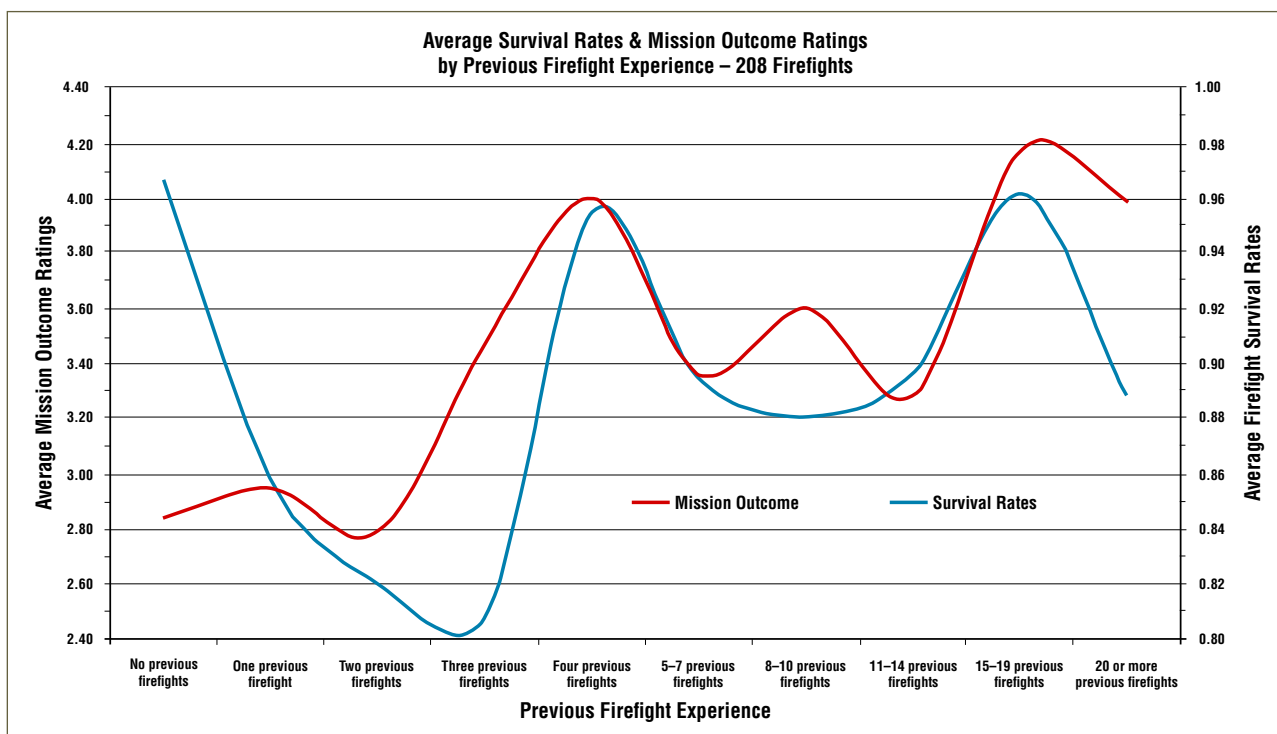
Seven operational variables also were rated using the five-point scale. The quality of intelligence was notably low, and only rarely did the narrators comment positively on the contributions of operational or tactical intelligence, while many commented negatively. Operational-variable ratings for units in engagements with own-force casualties did not show a significant difference from those without, nor did the ratings of U.S. and allied units show significant differences between the theaters of operations.

Relationships among the operational-variable ratings, previous firefight experience, mission-outcome ratings, and survival rates were examined. All of the operational-variable rankings displayed generally rising trends when plotted against previous-firefight experience. When par-

tioned by the number of previous firefights, both the rating of intelligence quality and the average of all seven operational-variable ratings within each subset showed some correlation with outcome ratings that increased in significance with increased previous-firefight experience. No strong associations between the operational-variable ratings and survival rates were found.

Detailed analysis of battle and environmental factors was limited to the 145 entries for U.S. and allied forces' engagements in Iraq and Afghanistan. We found the narrators of firefight accounts criticized rules of engagement (ROE) rarely and then because of apparently conflicting emphasis by senior commanders. Only infrequently did the authors quote dialogue of participants reproachful of ROE. However, when confronted with shoot/no-shoot predicaments, individuals and small units described in the narratives adopted conservative interpretations, choosing to minimize collateral casualties at some possibly increased risk to their personal safety. The general lack of specific commentary on ROE in the accounts combined with numerous references to the presence, or possible presence, of civilians indicates that the rules are well internalized and simply regarded as the way we fight, regardless of any tactical advantage they may give our opponents.

It is troubling that only a few of the accounts mentioned human-terrain cultivation and exploitation in connection with tactical actions. The scarcity of reference seems mostly due to a generalized disconnect between formal intelligence processes and small-unit activities during early operations in Iraq and Afghanistan. Firefights from this period are more prevalent in the database than later encounters fought with more mature counterinsurgency methods, greater cultural sensitivity, and better linguistic support.



Hostile staged attacks or ambushes were the most common initiating activity, starting 115 of the 145 firefights since 2001 in the database. They were noted in 84 percent of the 98 engagements with friendly casualties and in 70 percent of the 47 firefights without own-force casualties. Only about a third of those attacks were classified as surprise encounters, with the others occurring during movement-to-contact or search-and-clear operations when combat was expected; 446 of the 982 casualties were associated with these operations. Eleven percent of the accounts involved units responding to firefights in progress as reinforcements or quick-response forces.

The average firefight duration for units in their fourth or earlier battle was over six and a half hours with a median of two hours. In contrast, units in their fifth or later firefights averaged less than three and a half hours with a median duration of only one hour. Variance in firefight duration was substantial.

Engagements initiated during darkness were slightly less likely to result in own-force casualties than those started in daylight hours, reflecting the advantages provided by night-vision technology. Perhaps more relevant to training issues were comparisons of the battlefield terrains with the corresponding shares of casualties: 63 percent of the database's engagements by U.S. and allied forces in Iraq and Afghanistan were fought in urban settings and account for 50 percent of the casualties; 6 percent of engagements in suburban areas resulted in 3 percent of the casualties; and in rural terrain 22 percent of the fights produced 17 percent of the casualties. Most notable, the 9 percent of

firefights conducted in mountainous terrain produced 30 percent of the casualties, which suggests a need to train for 200- to 300-meter engagements with targets at various elevations. While many of the early engagements in Afghanistan and northern Iraq were contested by relatively inexperienced forces in mountainous terrain, their disproportionate share of casualties is as troubling as our forces' prowess in urban combat is heartening.

Casualty and Survival Factors

The encoding process included identifying the factors that contributed to casualties during the 135 firefights in the database in which own-force personnel were killed or wounded, and identifying factors that contributed to survival during all 208 engagements. More than one factor could be assigned, but only explicit or clearly contributing factors were listed.

The survival and casualty factors identified during the study are well known to experienced soldiers, Marines and SEALs, as they were to their predecessors during prior eras. No previously undetected skill or ability was revealed, but our methods allowed us to (1) statistically determine the criticality of the first four engagements, (2) identify specific examples of the skills and behaviors that contribute to casualties and survival, and (3) quantify the relative significance of the factors and place them in order of priority.

The study discovered the number of exposures necessary to achieve an advantage in combat and also identified 277 survival factors, casualty factors, skills, and lessons



Men of the 3d Battalion, 5th Marines evacuate a comrade hit by an improvised explosive device during a patrol in Afghanistan's Helmand Province in December 2010. While IED attacks seem to largely define the nature of combat in America's current conflicts to much of the public, nearly as many U.S. military personnel (2,500) have died in firefights in Iraq and Afghanistan, the authors note.



A sergeant of the 3d Battalion, 3d Marines (foreground) and Afghan National Army soldiers bound toward a road to get into a support position during a firefight in Trek Nawa, Afghanistan, in October 2010. The authors conclude that their “study confirmed the importance of training and rehearsal of battle drills to surviving firefights. . . . Clearly, we have an opportunity to increase combat effectiveness and survival rates. . . .”

learned from the firefight database, interviews, and correspondence with highly experienced combat veterans. Further analysis combined and reduced the results to five categories of skills, knowledge, and behaviors in order of their contribution to survival during firefights:

- Weapons Proficiency
- Situational Awareness
- Tactics and Drills
- Use of Cover and Concealment
- Leadership/Communications Skills.

The study confirmed the importance of training and rehearsal of battle drills to surviving firefights. An earlier survey discovered that 30 percent or more of soldiers and Marines believe their preparation for combat to have been inadequate; 36 percent of our experts reported the same assessment. Clearly, we have an opportunity to increase combat effectiveness and survival rates by incorporating study results in instruction and exercises.

The Crucial First Few

What next? We will never have the funding or time to train as much or as well as we might want; however, we know training should focus on the most important factors first. We now know the lessons soldiers, Marines, and SEALs learn in their first few firefights that contribute to survival involve weapon proficiency, situational awareness, tactics and drills, use of cover and concealment, leadership, and communications in circumstances of extreme sensory and cognitive overload. Army Colonel John Surdu, who conceived the study as a program manager at the Defense Advanced Research Projects Agency, noted:

How do we distinguish and then replicate the key environmental and sensory factors that pump up the adrenaline and more accurately convey the stressors of battle? Which features of ‘cluttered, dirty, and confusing’ matter when trying to impart lessons prior to combat and which

are superfluous, like overly fine visual details in our virtual-reality simulators that contribute little to training effectiveness? We must create training systems that increase proficiency in these key areas, in an environment that is sufficiently realistic in dimensions that matter. Because these factors are strongly correlated with survivability, experiencing them before the first firefight will result in fewer casualties.⁶

We cannot generate the full range of anxiety and confusion incident to battle in our training, but we can come a lot closer. The training systems, devices, and scenarios we should develop are likely to be less expensive than those we do build just because we can. ✪

1. Jack Stuster and Zail Coffman, *Capturing Insights from Firefights to Improve Training*, Phase I Final Report (Sacramento, CA: Anacapa Sciences Inc., 2010), sponsored by Defense Advanced Research Projects Agency, Amy K.C.S. Vanderbilt, COTR, ARPA Order: AT64-00, PAN RTW 2W-09 ; Contract Number W31P4Q-09-C-0160.
2. S. L. A. Marshall, *Men Against Fire: The Problem of Battle Command in Future War* (New York: William Morrow, 1947).
3. Roger J. Spiller, “S.L.A. Marshall and the Ratio of Fire,” *Royal United Services Institute Journal*, Winter 1988, 68.
4. Fick, Nathaniel. *One Bullet Away: The Making of a Marine Officer* (New York: Houghton Mifflin, 2005), 219.
5. The Soviet-Mujahideen accounts included in the database were found in *The Bear Went Over the Mountain: Soviet Combat Tactics in Afghanistan*, trans. and ed. by Lester Grau (Washington, DC: National Defense University Press, 1996).
6. COL Surdu private communication, 2010.

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Mr. Coffman, a cultural anthropologist, originally was trained as a combat engineer and was commissioned in the Quartermaster Corps. He has worked extensively in the application of emerging technologies. He specializes in qualitative and quantitative data collection and analysis, moonlighting as a range master and firearms instructor.