FROM A DISTANCE:

THE PSYCHOLOGY OF KILLING WITH

REMOTELY PILOTED AIRCRAFT

by

Lieutenant Colonel Joseph L. Campo, USAF

A dissertation presented to the faculty of Air University in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Maxwell Air Force Base, Alabama

2015

Thomas D. McCarthy, Colonel, USAF
Commandant and Dean
School of Advanced Air and
Space Studies
27 Apr 15

Dr. Stephen D. Chiabotti, Committee Chair 27 Apr 2015

Dr. Wayne L. Chappelle 27 Apr 2015

Dr. James W. Forsyth, Jr. 27 Apr 2015

DISCLAIMER

ABOUT THE AUTHOR

Lieutenant Colonel Joseph Campo is an eighteen year veteran of the United States Air Force. He has operational experience in the F-16, MQ-1, and MQ-9 aircraft. His most recent assignment was commander, 26th Weapons Squadron, USAF Weapons School.

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

ACKNOWLEDGMENTS

I would like to thank my committee for their advice and support on this project. I would also like to thank the professionals at numerous remotely-piloted aircraft wings who assisted this work through numerous interviews, ideas, and sanity checks throughout the process. Most importantly, thank you to the aircrew who took time from their demanding schedules to be interviewed for this study.

ABSTRACT

For thousands of years people have continually moved themselves farther and farther away from the point of physical engagement during battle. This unending transformation has resulted in palpable physical and emotional distancing between attackers and their targets. At their inception, remotely piloted aircraft (RPA) appeared as the next evolution in this process, providing near complete physical isolation between combatants. Yet, there exists anecdotal and medical evidence indicating RPA aircrew are experiencing mental reactions to warfare as strong as Post-Traumatic Stress Disorder. The confusing array of fact and opinion on this subject demands a further inquiry focused specifically on the characterization of psychological responses to killing from RPA aircrew.

This study provides a characterization of the psychological responses to killing among MQ-1/9 pilots and sensor operators who have employed weapons and killed via remote combat. Additionally, it analyzes MQ-1/9 aircrews' overall mental engagement with combat operations, their understanding of warfare despite the distances involved, and the relation of video games to this form of aerial warfare. This study should lead to better understanding of RPA aircrew and concepts regarding the character of modern warfare.

The methodology used to characterize MQ-1/9 aircrew psychological responses to killing involved interviewing 111 MQ-1/9 aircrew who have employed weapons and killed via remote-combat operations. Interviews were conducted among thirteen different squadrons across the United States. Interview responses were categorized within the emotional, social, and cognitive domains for comparison across independent variables focused on aircrew background, technology applications, and mission-specific events. Additionally, interview subjects were queried on supplementary topics regarding their mental engagement with warfare and video-gaming habits.

The results of this study indicate MQ-1/9 aircrew are mentally engaged in combat despite the distances involved and are psychologically impacted by killing. The technology inherent in the MQ-1/9 system provides MQ-1/9 aircrew a capability to emotionally *separate* and *connect* to their combat environment.

Across MQ-1/9 aircrew, differences in duty position and prior experiences conditioned psychological responses. Sensor operators, direct-accession aircrew, and aircrew lacking prior combat deployments reported increased rates of negative psychological responses to killing compared to pilots and more-experienced aircrew. Moreover, aircrew with prior mobility/reconnaissance experience reported increased rates of negative psychological response to killing compared to prior fighter/bomber pilots.

Technology improvements in the MQ-1/9 which provide high-definition video were not shown to impact aircrew psychological responses to killing. Mission-specific events involving danger to friendly ground forces and actual or near collateral damage produced the highest rates of psychological response to

killing in the study. Conversely, MQ-1/9 aircrew that tracked a target for an extended period of time prior to striking did not demonstrate any appreciable psychological response differences compared to those who did not extensively track their targets prior to killing.

Aircrew that felt psychologically ill-prepared to kill were more likely to report negative psychological reactions to their first-kill. This group included direct-accession aircrew and pilots with prior mobility or reconnaissance aircraft experience. Moreover, leadership support to aircrew from front line supervisors through squadron commanders proved crucial to both the mental preparation for killing and the subsequent rationalization and mental processes individual aircrew go through following at least their first kill.

Approximately four percent of MQ-1/9 aircrew have opted-out of a weapons strike to avoid killing, with half of these individuals attempting to hide this fact from their leadership. Aircrew were also repeatedly conflicted emotionally over killing in combat, with over 20 percent of aircrew reporting both positive and negative emotions for the same event. Finally, post-mission socializing was found to have a statistically significant impact on psychological responses. Aircrew assigned to squadrons that do not typically socialize after a mission were over three times as likely to report a first-strike negative emotional response as those who do socialize.

On video games specifically, study participants averaged 2.4 hours of video gaming per week in their personal time. None of the MQ-1/9 aircrew interviewed for this study consider operating an RPA analogous to playing video games.

This study's recommendations include expansion of proactive measures to psychologically prepare and support MQ-1/9 aircrew in remote killing, reprioritizing mental health support requirements to focus on the highest-risk areas, increasing post-mission socializing and leadership involvement, and better public education on the mental engagement to warfare and psychological reaction to killing exhibited by MQ-1/9 aircrew.

Finally, this study provides utility in demonstrating that the mental engagement with warfare and psychological reaction to killing still exists among contemporary warriors and has not been reduced to zero in the MQ-1/9 community. The continuing ethical and moral relativism society uses to place new weapons and methods on the battlefield are in plain view with the MQ-1/9; perhaps even more so given the ability for the general public to view killing via RPA as quickly as one can type "MQ-1 Strike" into a Google search query. But this fact has not reduced the psychological engagement among the aircrew to zero, or even to an amount small enough that we should begin to question their ability to comprehend warfare and killing despite the vast distances involved.

CONTENTS

Illustrations

Tables

Figures

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

Chapter 1

The evolution of killing from a distance

> To fight from a distance is instinctive in man. From the first day he has worked to this end, and he continues to do so.
>
> \- Ardant du Picq[1]

While the advent of weapon systems such as the Tomahawk cruise-missile and MQ-1 Predator remotely piloted aircraft (RPA) are sometimes singled out as ground-breaking or revolutionary in their enabling of effects from extremely long-range, history demonstrates that mankind has pursued distanced-based warfare for thousands of years. The first known artificial weapon is the bola, developed roughly 1.5 million years ago. Simple in design, the bola's distinguishing feature is several weights attached together by a string or cord. The bola was significant because it provided a real standoff capability, the first demonstrated example of man's ability to get away from the fight.[2] Thereafter, the Upper Paleolithic era, roughly between 40,000 B.C. and 10,000 B.C., witnessed a dramatic increase in the development of both tools and distance-enabling weapons, including the throwing stick, the spear thrower, the harpoon, and the sling.[3] Most importantly, the bow was invented during this period, likely in North Africa.[4] As historian Robert O'Connell notes

[1] Charles Jean Jacques Joseph Picq and John Nesmith Greely, *Battle Studies; Ancient and Modern Battle* (Harrisburg, PA.: Military Service Publication, 1947), 54.
[2] Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression* (New York, NY: Oxford University Press, 1989), 22.
[3] Charles A. Singer, *A History of Technology* (Oxford: Clarendon Press, 1956), 32; Robert Hardy, *Longbow: A Social and Military History* (New York, NY: Arco Publishing, 1977), 12.
[4] Singer, *A History of Technology*, 32.

in *Arms and Men*, the bow was an ingenious device for distance-based warfare, “A combatant might spend an afternoon shooting away at long range with little fear of injury.”[5]

Bows remained an important aspect of warfare for thousands of years, albeit in various forms. The Assyrians, residents of Mesopotamia, used the bow in both the Bronze and Iron Age, demonstrating an experimental attitude toward weaponry and integration of combined arms.[6] The Assyrians also mated archers with horses around 875 B.C., introducing a deadly weapon combination that would persist until the introduction of firearms over two millennia later.[7]

In these early developments, humankind was executing what modern scholars of warfare have come to understand as the desire to kill without risk of personal injury or death. As Dave Grossman and Loren Christensen explain in *On Combat*, “Man’s limited reach created a need for a range advantage in an effort to attack more people than just those in immediate reach and to do so without placing himself in danger.”[8] French officer and theorist Ardant du Picq had come to the same conclusion over a century earlier, stating “Man taxes his ingenuity to be able to kill without running the risk of being killed.”[9] Prior to

---

[5] O’Connell, *Of Arms and Men,* 26.
[6] Ibid, 40.
[7] Ibid.
[8] Dave Grossman and Loren W. Christensen. *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace.* 3rd ed. (Illinois: Warrior Science Publishing, 2008), 198.
[9] Du Picq, *Battle Studies*, 29.

his time, du Picq noted that archers on horseback could do as much damage as possible while risking the least possible injury to themselves.[10]

Variations on the bow continued to proliferate, including the development of the first arrow-shooting catapult around 400 B.C.[11] Alexander the Great made heavy use of an arrow-firing torsion catapult during his attack on Tyre in 332 B.C.[12] During this period, the best arrow-firing catapults had the accuracy and lethality to kill a single man at 100 yards and hit a group of men at 200 yards, ensuring the torsion catapult remained the leading artillery of the world until the adoption of gunpowder.[13]

Although a deadly weapon combination, one of the early challenges with archers and bows was a limited supply of ammunition. A fighting force weighted towards archers, once depleted of its deadly long-range missiles, could quickly find itself overcome by enemy cavalry. Even if the enemy lacked adequate cavalry, the threat from enemy soldiers who had just survived a long range arrow onslaught put in a precarious position archers not trained or properly equipped for close-range combat. In 53 B.C., a man named Surenas temporarily solved this dilemma by forming a corps of 1,000 camels to provide reserve arrows for his archers. Adequately armed with a near limitless supply of ammunition, his army was, "Able to shoot as it pleased throughout the

---

[10] Ibid, 45.
[11] O'Connell, *Of Arms and Men*, 65.
[12] Ibid, 63.
[13] W. Tarn, *Hellenistic Warfare and Naval Developments* (Cambridge, MA: Cambridge University Press, 1930), 112.

afternoon and evening of a long summer's day."[14] When faced with a Roman army more than three times its size, Surenas' army kept the legionnaires at bay with a continual barrage of arrows, defeating and demoralizing the enemy.[15] It was a watershed event presenting an opportunity to revolutionize warfare, but ultimately had little impact as Surenas was put to death the following year and the Romans failed to wholeheartedly adopt his newfound tactic.[16] The Romans would again be thwarted by long-range weapons in Europe several hundred years later when several Germanic tribes prevented them from crossing the Rhine river in 354 A.D. by showering them with arrows from their longbows.[17]

Nearly a thousand years later, the next significant development in the quest to increase the distance between archer and enemy came in the form of the crossbow, rediscovered in Europe during the eleventh century and widely available by 1100 A.D.[18] The crossbow's slow rate of fire and fragility limited its effectiveness, but it had a great psychological effect of compromising ancient prejudices against personal distanced-based weapons.[19] Moreover, the crossbow was easier to aim and employ from horseback than the traditional bow. Military archery began to grow in popularity with the lower classes and the bow became, in English context, a weapon of the patriotic underdog.[20]

---

[14] Ibid, 89.
[15] Ibid.
[16] Ibid.
[17] Hardy, *Longbow: A Social and Military History*, 21.
[18] O'Connell, *Of Arms and Men,* 95.
[19] Ibid, 96.
[20] Ibid, 102.

Yeomen, however, spurned the crossbow for the longbow, an extremely simple weapon available for centuries, and finally adopted throughout Europe in 12th century.[21] Using the bow, commoners could defeat knights, even armored ones, presenting a crucial challenge to the existing class system and long-standing warfare traditions. However, the English crown needed bowmen more than ancient traditions, and so in 1252 Henry III required yeomen owning less than 40 shillings worth of land to maintain a personal bow.[22] Henry III's successor, Edward I, treated archers remarkably well for the period, including regular payment for their services and bonus rewards.[23]

During the Hundred Years' War (1337-1453), English archers comprised the heart of a professionalized army and were used with great success in the battles of Crécy-en-Ponthieu, Poitiers, and Agincourt. The tradition-bound French, unable to close within customary infantry and cavalry ranges, suffered great losses during each of these battles.[24] During this period, knights found themselves starting to feel the pull of extinction from the battlefield due to their inability to adopt the bow as it lacked the tradition and status of the sword, yet found themselves unable to develop an effective counter-tactic to the deadly arrow that was designed to penetrate both mail and plate armor.[25] Archers of several variations had transformed warfare from close, personal combat to the

---

[21] Ibid, 103.
[22] Hardy, *Longbow: A Social and Military History*, 38.
[23] Ibid, 46.
[24] O'Connell, *Of Arms and Men*, 104.
[25] John Nef, *War and Human Progress: An Essay on the Rise of Industrial Civilization* (Cambridge, MA: Harvard University Press, 1950), 29.

development of killing zones, where men now died without ever seeing their antagonist.

While historically significant, the bow's dominance was relatively short-lived as gunpowder was introduced in the 1300s, beginning with battlefield cannon. From 1450 on, crossbows were gradually replaced by handguns and arquebuses, precursors to 20th century rifles.[26] The 1513 Battle of Fodden in northern England was arguably the last action where use of the longbow was decisive in the outcome.[27]

As chemical energy from gunpowder succeeded the physical energy required to draw and aim a bow, killing power shifted from physical prowess to training regime and professional skill.[28] Training marksmen had become easier than training bowmen, both in terms of time and effort expended.[29] Soldiers could now fight to the finish with a smaller cost in physical exertion than had been necessary in the Middle Ages and at distances sufficient to shield them from much of the carnage of their actions.[30]

Even courage in battle was redefined to include the ability to stand fast and take the punishment inflicted by distance-based weapons. One of the most telling examples of this metamorphosis occurred in 1582 near Brussels,

---

[26] Martin van Creveld, *Technology and War: From 2000 B.C. to the Present* (New York, NY: Free Press, 1989), 91.
[27] Hardy, *Longbow: A Social and Military History*, 131.
[28] van Creveld, *Technology and War*, 82.
[29] Hardy, *Longbow: A Social and Military History*, 131.
[30] Nef, *War and Human Progress*, 114.

where General Alexander Famese, Duke of Parma, and his staff attempted to dine in the open air during the siege of Oudenaarde.

> Hardly had the repast commenced, when a ball came flying over the table, taking off the head of a young Walloon officer who was sitting near Parma …. A portion of his skull struck out the eye of another gentleman present. A second ball… destroyed two more of the guests as they sat at the banquet. The blood and the brains of these unfortunate individuals were strewn over the festive board, and the others all started to their feet, having little appetite left for their dinner. Alexander alone remained in his seat, quietly ordering the attendants to remove the dead bodies, and to bring a clean tablecloth, he insisted that his guests should resume their places.[31]

The gunsmith had delivered a weapon that nearly negated hand-to-hand combat.[32] In 1596 the English instructed their forces to convert all remaining bowmen into musketeers.[33] Infantrymen would continue to dream of closing to hand-to-hand distances through modern times, but their capability to do so was severely compromised. By the mid-1500s, brass cannon had also widely proliferated, continuing to provide technological advances to artillery on the battlefield.[34]

The American Civil War witnessed further separation of combatants, linking weapons technology with mass production, resulting in a slaughter when the traditional battlefield tactics of mass assault were attempted.[35]

---

[31] O'Connell, *Of Arms and Men*, 119.
[32] Ibid, 121.
[33] Nef, *War and Human Progress*, 31.
[34] Ibid, 37.
[35] O'Connell, *Of Arms and Men*, 197.

Valiant charges across smoke-enveloped fields were still common, but most soldiers never saw the actual man who was ultimately responsible for their death. Those who dared charge across the battlefield in an attempt to meet their opponent face-to-face in Homeric fashion were often doomed to a barrage of flying bullets. An example is the fashion in which Major Keenan and his adjutant attempted to lead an infantry charge at the Battle of Chancellorsville in 1862, only to be found dead afterwards with thirteen and nine bullet wounds, respectively.[36]

A few years later during the Great War, artillery and machine guns would come to dominate the battlefield and further increase the distance between assailants. Courage and leadership no longer decided the outcome of battles; it had come down to who owned the latest weapons and had the largest industrial capacity for weapons production.[37] The early 1900s battlefield had transformed into a no-man's land where the enemy was invisible and killing was largely accomplished via artillery.[38] However, during World War I, chivalry was again welcomed onto the battlefield as early fighter aircraft dueled in the sky above the stagnant and horrific trenches. Pilots tussled for supremacy as knights once had back on earth, executing combat in pairs and testing their warrior skills in close, personal combat.

---

36 Ibid, 19.
37 Ibid, 209.
38 Ibid, 210.

It was not to be. Even the aircraft was not immune to the pull of technology, and airmen found themselves heavily engaged in distance-based warfare by World War II. Royal Air Force (RAF) and United States Army Air Forces (USAAF) bombers killed between 300,000 and 600,000 people, most of them civilians, seeing the human faces of their targets only in their dreams.[39] During World War II, humankind had finally stretched the distance between combatants to a range where the threat from modern weaponry was shifted as much to the civilians from the actual military members. Similar results were seen in in the Pacific Theater when XXI Bomber Command began its incendiary bombing campaign against the Japanese mainland in March 1945.[40] Aerial bombing would not possess the technological capability to reverse this trend toward collateral casualties until the Vietnam War; and the first Gulf War would pass before the U.S. Air Force shifted a majority of its weapon engagements to highly accurate bombs, missiles, and rockets. The distance between combatants remained as large as ever, but in the 21st century the risk to civilians became an element that could be controlled while still delivering significant firepower against the enemy.

Following World War II, cruise missiles and intercontinental bombers joined military arsenals. Contemporary warriors could now launch from their homes in Missouri to strike targets half a world away, only to return again to

---

[39] Max Hastings, *Bomber Command (*New York, NY: Dial Press/J. Wade, 1979), 1.
[40] Wesley Frank Craven and James Lea Cate. *The Army Air Forces in World War II.* Volume V. (Chicago, IL: University of Chicago Press, 1948), xix.

the peace and solitude of life on the Great Plains. The ever-growing distances between adversaries reached their current zenith in August 2002 when a relatively obscure airborne platform known as the Predator fired a missile against a target in Yemen, killing six suspected terrorists.[41] The Predator pilot was neither airborne nor anywhere near the strike. While the Predator aircraft is a key piece in the evolution of distance-based weapons and central to this research project, its details will be covered in the next chapter. Let us now spend a moment reviewing the repeated, yet futile, attempts to harness technology and prevent the practice of distance-based warfare where opponents struck from afar.

Challenges to distance-based warfare

In his book *Warrior Geeks*, International Relations author and professor Christopher Coker states, "What we are valuing is physical involvement in war; we portray this embodiment as imparting value to war, and expressing that value through the acts that war brings forth, especially courage and sacrifice."[42] Additionally, in her journal article, "The End of Military Virtue," Laurie Calhoun claims, "Once upon a time, every single man who agreed to participate in war, including the leader who called his troops to arms, risked making the most significant sacrifice that any human being could possibly

[41] Bill Yenne, *Attack of the Drones: A History of Unmanned Aerial Combat* (St.Paul, MN: MBI Publishing, 2004), 8; Steven Zaloga and Ian Palmer, *Unmanned Aerial Vehicles: Robotic Air Warfare, 1917-2007* (Oxford, UK: Osprey, 2008), 4.
[42] Christopher Coker, *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War* (New York, NY: Columbia University Press, 2013), 26.

make: that of his very life."[43] What Calhoun and Coker yearn for is a return to ancient ideals of warfare that have slowly eroded, or evolved, over time and given rise the current state of warfare. Their works, while contemporary, simply restate a well-known desire that has been around for centuries.

During the times of Ancient Greece and Rome, the bow and sling were regarded as poor men's weapons. Professional soldiers of proper status had little regard for these tools of warfare, leaving bowmen and slingers to serve longer and for less pay than their counterparts.[44] The Romans took Homer's ethics to the extreme, creating an army of deadly men. Wielding the short sword, or gladius, they sought to fight at the closest possible range.[45] Westerners regarded the bow as a "sneaky" weapon according to author Martin van Creveld, but force of circumstances demanded fighting forces adopt it or suffer the consequences on the fields of battle.[46]

One of the best known proclamations against distance-based, highly lethal, weaponry came in 1139 when the Second Ecumenical Lantern Council imposed a ban on the crossbow.[47] Situational ethics applied even then, as the ban was applied to use of the crossbow only against Christians. No such ban was imposed on such a highly effective weapon against Muslims.[48] Early nobles, however, never dreamed of using the crossbow or any of its variants

---

[43] Laurie Calhoun, "The End of Military Virtue," *Peace Review* 23: 377.
[44] Martin van Creveld, *The Transformation of War* (New York, NY: Free Press, 1991), 81.
[45] O'Connell, *Of Arms and Men*, 70.
[46] van Creveld, *The Transformation of War*, 81.
[47] Ibid.
[48] O'Connell, *Of Arms and Men*, 95.

because it was a cheap weapon not worth bothering with as a status symbol.[49] Thereafter, the English banned the crossbow in the Magna Carta in 1215.[50] Yet, by the late 1200s, both crossbowmen and longbowmen were welcomed in the English army and paid regularly for their services.[51]

Firearms also experienced the scorn of mankind at the very time they were revolutionizing warfare and further increasing the distance between assailants. Early Mamluk Egypt and Samurai Japan both banned firearms due to their incompatibility with the social status of the ruling class, an act that would cost them significantly during future engagements with western powers.[52] During the 16th century, some Christians believed the speed obtained by musket-fired projectiles was supernatural, and the invention was truly the work of the devil.[53] In 1528, Henry VIII of England issued a proclamation outlawing both the crossbow and handgun, attempting to revive the past glories of the longbowmen, despite taking siege guns to France in 1523.[54]

Firearms also provided another opportunity (beyond the bow) for commoners to succeed in battle against knights and nobles, further threatening the social structure of medieval Europe. European nobles could hardly tolerate their valiant peers being "Killed by cowards who would not dare

---

[49] an Creveld, *The Transformation of War*, 81.
[50] O'Connell, *Of Arms and Men*, 103.
[51] Hardy, *Longbow: A Social and Military History*, 46.
[52] van Creveld, *The Transformation of War*, 82.
[53] Nef, *War and Human Progress*, 43.
[54] Hardy, *Longbow: A Social and Military History*, 133,135.

to look in the face the men they bring down from a distance with their wretched bullets."[55] Some traditional warriors found firearms so despicable that they cut off the hands or pierced out the eyes of captured arquebusiers (early riflemen).[56] In 1498, Gian Paolo Vitelli, an Italian condottieri, captured the small town of Buti near Pisa, Italy, and had the hands of all garrison gunners cut off.[57] Tradition notwithstanding, any sizable force wishing to remain competitive with its rivals could not forego adopting the latest technology, although many were known to try. In the 1700s, King Louis V of France reportedly refused to adopt a new gunpowder because it was overly destructive.[58]

One of Napoleon's contemporaries, Benjamin Constant, wrote a pamphlet in 1813 decrying modern war, claiming that actual fighting had lost its glory. Constant claimed war was unnatural for human beings as soldiers were struck and killed impersonally from a distance.[59] During the mid and late 19th century, machine gun manufacturers found their wares a tough sell in European defense ministries dominated by conservative aristocrats who continued to regard the bayonet charge as the ultimate form of contemporary combat. Most generals were intensely suspicious of new technology that

---

[55] Max Boot, *War Made New: Technology, Warfare, and the Course of History, 1500 to Today*. (New York, NY: Gotham Books, 2006), 22.
[56] Nef, *War and Human Progress*, 136.
[57] Ibid, 137.
[58] Bernard Brodie and Fawn McKay Brodie, *From Crossbow to H-bomb* (Bloomington, IN: Indiana University Press, 1973), 101.
[59] Nef, *War and Human Progress*, 337.

upended current military doctrine and lessened the requirement and chances for individual feats of valor. Machine gun sales lagged until the start of the Great War, where the machine gun, like previous evolutions of distance-based killing before it, was revealed to be both a menace and a necessity.[60]

The persistent relativism of the acceptability of certain technologies and weapons continued into the 19th century with attempts to regulate both on an international scale at St. Petersburg in 1868 and The Hague in 1907.[61] The outcome of these meetings included several new restrictions on distance-based warfare, including a ban on explosive projectiles weighing less than 400 grams, a prohibition on dropping explosives from balloons, and restricting submarines from sinking merchant vessels without first warning the crews. Curiously absent was more a general prohibition against bows, firearms, and artillery, given the zeal with which previous generations fought their introduction onto the battlefield and bemoaned the end of close-in warriors and their ethos from such dastardly tools of war. Instead, it would appear the weapons firmly lodged in each nation's arsenal had become accepted as a new norm of warfare while newer, evolutionary weapons were seen as contemptible, requiring prohibition to keep them from the battlefield of proper warriors. Unsurprisingly, all three of these prohibitions were violated by the closure of World War I.[62] Even gas, banned at St. Petersburg, was used in World War I

---

60 Boot, *War Made New*, 151.
61 van Creveld, *The Transformation of War*, 84.
62 Ibid.

and as recently as the Iran-Iraq and Syrian civil wars.[63] Prohibitions on weaponry were continually refined, rejected, or outright ignored while ethical relativism marched on.

Distance-based warfare reached a provisional pinnacle during World II's strategic bombing campaigns in both the European and Pacific theaters. One cannot help but admire the irony of President Roosevelt's use of the term "barbarity" in condemning Japanese aerial bombing of Chinese cities in his October 1937 speech, only to witness the Allies adopt a similar policy less than ten years later.[64]

In the span of a generation, military men were at once outraged at the introduction of a new technology that enabled warriors to increase the distance between adversaries, while adopting the technology or tactics for their own advantage and survival, and then once again feigned outrage at the next evolutionary development in warfare tactics, technology, and weapons. This leads to our current, but definitely not final, state of affairs in the aerial domain, remotely piloted aircraft armed with lethal weapons.

---

[63] Ibid, 85.

[64] John W. Dower, *War without Mercy: Race and Power in the Pacific War* (New York, NY: Pantheon Books, 1986), 38.

Chapter 2

MQ-1 Predator and the next evolution of killing from a distance

The lineage of remotely piloted aircraft (RPA) is strikingly similar to the development of weapons presented in the previous chapter, ebbing and flowing through stops and starts, technological breakthroughs, and cultural prejudices, finally delivering RPAs in their current form in 2001.[1]

Early drones appeared during World War I, but lacked adequate guidance and navigation technology to warrant serious consideration for large-scale adoption.[2] Largely a precursor to modern-day cruise missiles, the most well-known was the Kettering Bug, which appeared nothing more than a cigar-shaped bomb with a prop on the front and bi-plane wings attached to each side.[3] While early attempts were ultimately unsuccessful, they set the stage for future target drones used by the military for decades thereafter.[4]

The first large-scale adoption of military drones occurred immediately prior to World War II when the US Army contracted the Radioplane company

---

[1] The terms Remotely Piloted Aircraft (RPA) and Unmanned Aerial Vehicle (UAV) are used interchangeably throughout this work, both requiring a human to actively control an air vehicle that is recoverable and usable beyond a single mission. USAF RPAs have an additional distinction, requiring the use of a rated aviator for aircraft control. The term drone refers to air vehicles designed to fly a pre-programmed routing, or accept human control inputs, but not designed for recovery via traditional runways and multiple uses.

[2] Steve Zaloga and Ian Palmer, *Unmanned Aerial Vehicles: Robotic Air Warfare, 1917-2007* (Oxford, UK: Osprey, 2008), 4.

[3] Zaloga and Palmer, *Unmanned Aerial Vehicles,* 7; Bill Yenne, *Attack of the Drones: A History of Unmanned Aerial Combat* (St.Paul, MN: MBI Publishing, 2004), 15.

[4] Zaloga and Palmer, *Unmanned Aerial Vehicles,* 6.

for aerial target drones, with the first designated OQ-1.[5] After the United States entered World War II, orders for Radioplane's target drones skyrocketed, and over 15,000 of various series were built before war's end.[6] Additionally, both the United States and Germany attempted to use cruise missiles and unmanned one-way bomber missions during the war with limited success. The German's jet propelled V-1 was launched against England during the summer of 1944, but lacked adequate guidance to be of use against specific targets.[7] Under Operations Aphrodite and Anvil, the United States tried to utilize B-17, B-24, and PB4Y aircraft in a hybrid drone and cruise-missile combination with mixed results.[8] While these bomber aircraft were unmanned for part of their mission, technologically they remain a far cry from today's RPA due to their inability to launch without pilots on board and one-way mission requirement.

Immediately following World War II and into the 1950s, while most drones would continue duty as aerial targets or transition to the new category of cruise missiles, Radioplane would develop a camera-carrying surveillance drone called the SD-1. The SD-1 and its camera payload were recoverable via parachute and thus became the world's first successful unmanned aerial vehicle (UAV) for reconnaissance.[9] Over 1,400 SD-1 UAVs and subsequent

---

[5] Yenne, *Attack of the Drones,* 17; The designation "OQ" meant "radio-controlled model" in the 1940s. The US Army and thereafter US Air Force would transition through several designations for unmanned aircraft, finally settling on "MQ," meaning "Multi-Mission / Unmanned" for the MQ-1 Predator and MQ-9 Reaper in 1997.

[6] Yenne, *Attack of the Drones,* 7.

[7] Ibid, 19.

[8] Ibid, 20.

[9] Zaloga and Palmer, *Unmanned Aerial Vehicles,* 10.

variants were produced for the U.S. Army between 1959 and 1966.[10] In the SD-1, engineers had solved several technological hurdles to removing pilots from combat barely four decades after the futuristic aerial knights first appeared over European battlefields during World War I. The US Air Force also examined surveillance drones during this time, but nothing approaching the scale of SD-1.

Instead, the USAF preferred drones to serve as aerial targets and decoys, awarding a contract to Ryan Aeronautical in 1948 for the Q-2 Firebee and fielding the first operational decoy, the jet-powered GAM-72 Quail, in 1961.[11] While originally intended to support surface-to-air and air-to-air gunnery training, over 6,500 Ryan Firebees would eventually get produced in many different variants, becoming the most successful jet-propelled drone of the twentieth century.[12] Spurred partially by the Soviet shoot-down of a U-2 in May 1960, the USAF began modifying Ryan's target drones for reconnaissance use under the operational name Lightning Bug, with widespread use in Southeast Asia during the mid and late 1960s.[13]

During this period, two seldom-mentioned events occurred that signaled a growing interest in using UAVs for dull, dirty, and dangerous missions. First, in November 1964, China would shoot down a Lightning Bug, causing very

[10] Ibid.

[11] Yenne, *Attack of the Drones,* 23.

[12] Ibid, 22.

[13] Ibid, 25. The original operational name was Fire Fly, but this name was compromised and the name changed to Lightning Bug in March 1963. See Tom Ehrhard, *The Secret History of UAVs* for more information.

little reaction in the United States due to the lack of human pilot involved in the incident; a far cry from earlier episodes following the loss of manned U-2s.[14] Second, after a manned EC-121 aircraft was lost over enemy territory in 1969, a signals-intelligence-collection package was added to the Firebee, which allowed the UAV to complete missions similar to those of the EC-121.[15] The USAF would add chaff-dispensing packages in short order following Lightning Bug's reconnaissance variants, but weapons were still markedly absent.[16]

Finally, in 1971, the USAF conquered the last technological hurdle required to enable 21st century RPA warfare by arming Ryan Firebees with various types of ordnance under the Have Lemon program. The first live-fire test occurred in December 1971 when a Ryan Firebee fired a Maverick air-to-ground missile and scored a direct hit.[17] The stage had been set for the introduction of the Predator.

The MQ-1 Predator and MQ-9 Reaper lineage can be traced back to the Defense Advanced Research Projects Agency (DARPA) and a classified study of long-endurance UAVs called Teal Rain.[18] In 1984, DARPA issued a Teal Rain development contract to Leading Systems of Irvine, California, to build a

---

14 Thomas P. Ehrhard, *Air Force UAVs: The Secret History* (Arlington, VA: Mitchell Institute Press, 2010), 9.
15 Yenne, *Attack of the Drones,* 27.
16 Zaloga and Palmer, *Unmanned Aerial Vehicles,* 12.
17 Yenne, *Attack of the Drones,* 29.
18 Curtis Peebles, *Dark Eagles: A History of Top Secret U.S. Aircraft Programs* (Novato, CA: Presidio Press, 1995), 207.

medium-range, low-cost UAV. The resulting project, led by Israeli designer Abraham Karem, was called Amber.[19] The original Amber design had an inverted "V" tail, pusher propeller, and a long, thin wing.[20] By 1988, Amber had exceeded 27,000 feet in altitude and demonstrated thirty-five hour endurance.[21] A total of thirteen Amber aircraft were built, but the program was canceled during late 1980s budget cuts.[22]

Undeterred, Leading Systems developed a commercial descendant of Amber, the GNAT-750, and attempted to sell the aircraft in foreign markets.[23] General Atomics purchased Leading Systems in 1990 and continued development of the aircraft, securing a contract with Turkey for deliveries in 1993.[24] Also in 1993, the Joint Chiefs of Staff (JCS) convinced Pentagon acquisition chief, John Deutch, of a new UAV requirement.[25] With Deutch's support, the Department of Defense (DOD) used a quick-reaction, advanced-concept-technology-demonstration (ACTD) program to begin developing an upgraded variant of the GNAT-750.[26] The DOD's resulting "Tactical Endurance UAV," later named Predator, was a larger version of the GNAT-750 with

[19] Ehrhard, *Air Force UAVs: The Secret History*, 20-21.

[20] Peebles, *Dark Eagles,* 207. In *Air Force UAVs: The Secret History,* Ehrhard notes that the inverted "V" tail was originally designed for optimal stowage and deployment from torpedo tubes.

[21] Peebles, *Dark Eagles*, 208.

[22] Ibid.

[23] Ehrhard, *Air Force UAVs: The Secret History*, 21.

[24] Peebles, *Dark Eagles*, 212.

[25] Ibid; Ehrhard, *Air Force UAVs: The Secret History*, 49.

[26] Michael R. Thirtle, Robert V. Johnson, John Birkler, *The Predator ACTD: A Case Study for Transition Planning to the Formal Acquisition Process* (Santa Monica, CA: RAND, 1997), 5-9.

synthetic aperture radar (SAR) and satellite data link, allowing the first true beyond line-of-sight control of a UAV.[27] Meanwhile, the Central Intelligence Agency (CIA) acquired the original GNAT-750 for a planned October 1993 deployment to the Balkans. [28]

The CIA deployed the GNAT-750 to Albania in February 1994, and in July of that same year the first RQ-1 Predator took flight in California.[29] The Predator made its military debut in 1995 with the US Army in support of Operations Deny Flight and Deliberate Force over Bosnia.[30] After witnessing Predator operations in Bosnia crystallize congressional support for the program, and worried the Army would "just screw it up," Air Force Chief of Staff General Ronald Fogleman moved to take Predator from the Army.[31] The Vice Chairman of the Joint Chiefs of Staff named the USAF as the lead service for Predator in December 1995.[32]

Five months before, in August, the USAF had established the 11th Reconnaissance Squadron (RS), its first RQ-1 squadron, at Indian Springs Auxiliary Field (now Creech Air Force Base), Nevada.[33] In September 1996, the 11th RS took over Predator operations in Hungary.[34] The Predator program

[27] Ehrhard, *Air Force UAVs: The Secret History*, 22; The CIA's GNAT-750 did have beyond line-of-sight capability through an airborne relay system using manned aircraft.
[28] Peebles, *Dark Eagles*, 212-213.
[29] Ibid, 215; Ehrhard, *Air Force UAVs: The Secret History*, 50.
[30] Walter J. Boyne, "How the Predator Grew Teeth," *Air Force Magazine*, July 2009, 43.
[31] Ehrhard, *Air Force UAVs: The Secret History*, 50-51.
[32] Thirtle et al., *The Predator ACTD,* 134-135.
[33] Note: In RQ-1, "R" is Reconnaissance, "Q" is Unmanned and "1" indicates the series. A change in designation from "RQ-1" to "MQ-1" occurred in 2002 with the addition of the AGM-114 Hellfire missiles.
[34] Ehrhard, *Air Force UAVs: The Secret History*, 51.

reached its next major milestone in 1999, when, in just 38 days from approval to fielding, an RQ-1 was equipped with a laser designator for Bosnia operations.[35] A laser designator provided the Predator with an immediate target-marking capability for coordination with strike aircraft in response to an urgent requirement from the 16th Air Force Commander, Lt Gen Michael Short.[36] The CIA first flew the Predator in Afghanistan in September, 2000, a full year ahead of the 9/11 attacks, and likely tracked Osama Bin Laden with an MQ-1 on September 7 and 28, 2000.[37]

Then, on February 16, 2001, an AGM-114 Hellfire missile was launched from a Predator over the desert of the southwestern United States, only 61 days after USAF Chief of Staff, General John Jumper, had decided to weaponize the system.[38] Bounding ahead of the Have Lemon tests, the USAF now had a fully controllable aircraft capable of delivering highly detailed, full-motion video to a pilot sitting hundreds of miles away from the fight; and this same pilot finally possessed the power to employ kinetic-kill weapons against targets on the battlefield. It was an evolutionary increment in technology and a long time in the making, but also a monumental leap in the character of modern aerial warfare.

---

[35] Boyne, "How the Predator Grew Teeth," 44.
[36] Ibid, 43.
[37] *The 9/11 Commission report: Final report of the National Commission on Terrorist Attacks upon the United States* (Washington, D.C.: US Government Printing Office, 2004), 190.
[38] Boyne, "How the Predator Grew Teeth," 44-45.

The MQ-9 Reaper, a larger, more-powerful, version of the MQ-1 Predator joined the USAF RPA community in the mid-2000s. The MQ-9 provided marked advantages over the MQ-1 with a much increased weapons carriage capacity and improved performance. Additionally, the MQ-9 sensor package included an upgraded electro-optical (EO) sensor and SAR. The pre-production YMQ-9 was sent to Afghanistan in 2005, and the production MQ-9 Reaper first flew in Afghanistan in September 2007.[39]

Thereafter, the MQ-1 and MQ-9 fleet grew exponentially. In 2004, the MQ-1 operated six Combat Air Patrols (CAP) in Iraq and Afghanistan.[40] By 2006, output had doubled to 12 CAPs. By 2010, the MQ-1 and MQ-9 were operating 45 CAPs in support of combat operations and had surpassed one million flight hours.[41] In 2014, the USAF operated 65 CAPs around the world, providing both reconnaissance and kinetic-kill capability to U.S and allied forces.[42]

Aircraft Description

The MQ-1 Predator is classified as a medium-altitude, long-endurance RPA.[43] Its four-cylinder engine drives a pusher propeller, providing a typical

39 General Atomics Aeronautical Systems YMQ-9 Reaper, **http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=16040** (accessed 1 Aug 2014).

40 A Combat Air Patrol is roughly one aircraft airborne between fourteen and twenty-two hours in duration, nearly a full day.

41 Headquarters US Air Force (AF/A2CU), RPA Task Force, "RPA Fast Facts," 1 February 2011.

42 432nd Wing. Mission Export Brief, PowerPoint presentation, January 2014.

43 MQ-1B Factsheet, http://www.af.mil/information/factsheets/factsheet.asp?id=122 (accessed 24 Jan 2010)

cruising speed of only 70 knots. The MQ-1 usually operates between 10,000 and 25,000 feet Mean Sea Level (MSL) and can remain airborne 18-22 hours. Armed with two AGM-114 Hellfire missiles, the MQ-1 no longer carries the SAR. Aircraft sensors include an electro-optical (EO) and infrared (IR) camera along with a laser designator and IR pointer for target-marking and weapon guidance. Since the MQ-9 Reaper evolved from the Predator, the two RPAs share many subsystems with a few key differences. The MQ-9 is much larger than the Predator and is powered by a turboprop engine, providing a top speed of approximately 220 knots and altitude capability exceeding 30,000 feet MSL. In addition to Hellfire missiles, the MQ-9 can employ the GBU-12 500-pound laser-guided bomb. MQ-9 endurance depends heavily on aircraft configuration and flight profile and can range between 12-20 hours.

The MQ-1 and MQ-9 require two aircrew for operation: one pilot and one sensor operator. Additional intelligence personnel supplement the aircrew during operational missions. The Predator's primary mission is Intelligence, Surveillance, and Reconnaissance (ISR), but both RPAs can execute close air support (CAS), aerial interdiction, and combat search and rescue.[44]

The MQ-1 and MQ-9 communications suite consists of an on-board very high frequency/ultra high frequency (VHF/UHF) radio, internet relay chat client (mIRC), and various phone systems. The MQ-1 pilot controls the aircraft

[44] Source: Author

through a C-band line-of-sight (LOS) link or Ku-band beyond line-of-sight (BLOS) satellite link.[45] See figure 2.1 below.

[45] Per the Institute of Electronics and Electrical Engineers, C-band is the portion of the electromagnetic spectrum between 4.0 and 8.0 gigahertz. Ku-band resides between 10.95 and 14.5 gigahertz.

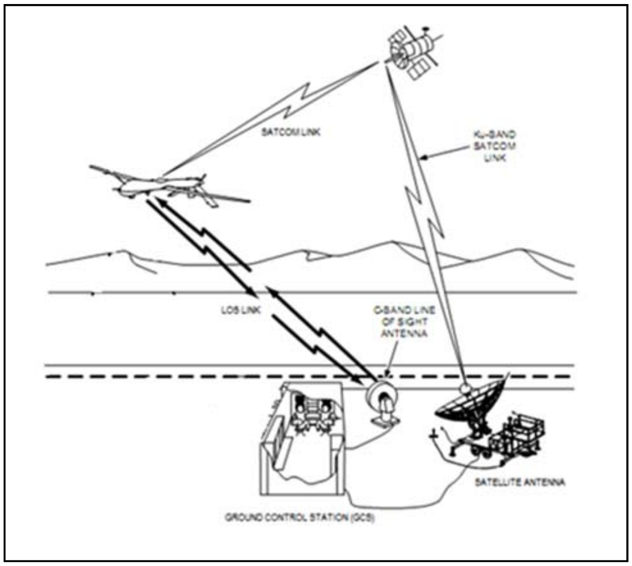


Figure 2.1 MQ-1 and MQ-9 LOS and BLOS Configuration

Source: Technical Order (TO) 1Q-1(M)B-1, MQ-1B and RQ-1B Flight Manual, Change 11, 14 Jan 2008, 1-5.

When operating under Ku-Band satellite communication (SATCOM) mode, aircraft range from launching base is limited only by the satellite footprint and aircraft endurance. Figure 2.2 below depicts the Ku-band footprint of Intelsat's G-19 satellite for North America as an example of Ku-band satellite coverage for the MQ-1 or MQ-9. Everything inside the orange shading depicts valid satellite coverage for RPA BLOS operations.

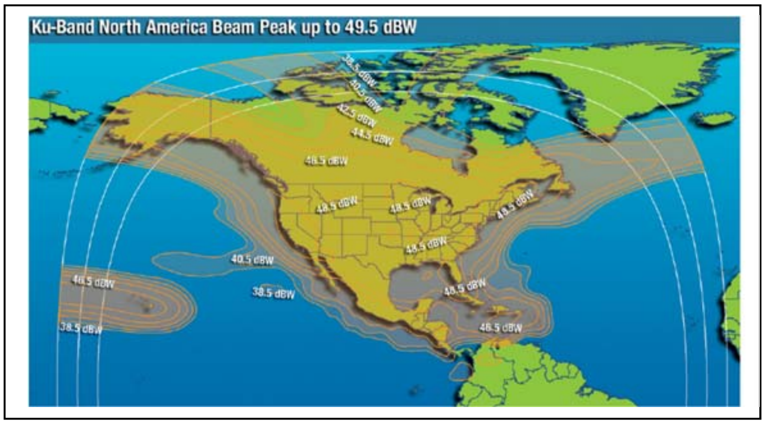


Figure 2.2. Coverage of Intelsat G-19 satellite at 97° west

Source: Intelsat Satellite Guide, June 2010, [*http://www.intelsat.com*](http://www.intelsat.com)

Remote split operations (RSO) further expand the distance between the aircrew and the aircraft. In RSO, the connection that runs from the Ground Control Station (GCS), or cockpit, to the satellite antenna in figure 2.1 is augmented by a cable that is several thousand miles long. See figure 2.3 below.

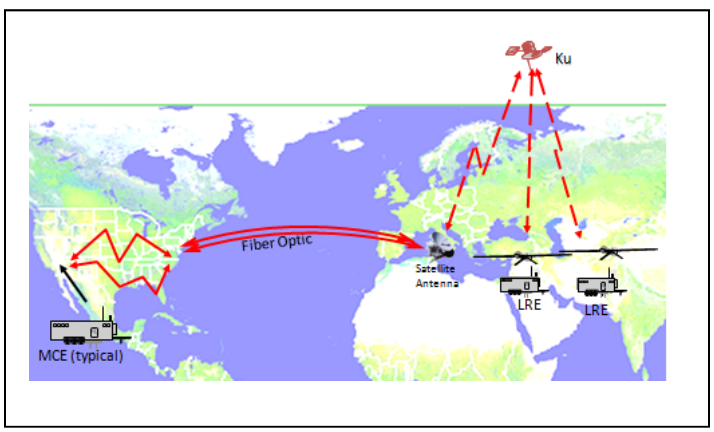


Figure 2.3. Remote Split Operations Architecture

Source: Author.

RSO-enabled operations permit the majority of aircrew and intelligence personnel to remain stateside while conducting operations and have become the standard method of USAF RPA warfighting since the early 2000s. However, a small contingent of equipment and personnel are still deployed to launch and recover the aircraft. The RPA community refers to this deployed contingent as the Launch and Recovery Element (LRE).

The Experience of Killing via RPA

RPA aircrew engaged in combat operations are subjected to a unique environment, an evolution in warfare that places killers thousands of miles away from their target, yet provides remarkably clear video of the event and subsequent aftermath. Sitting in their cockpit, the RPA pilot and sensor operator are faced with an array of video monitors providing a picture of their combat environment, several maps displaying their battlespace, aircraft health and status displays, and nearly ten separate methods for communication with the outside world including internet relay chat (mIRC), phones, line-of-sight radios, satellite communication radios, and a robust intercom system that can stretch across the globe. With an average of fourteen screens per cockpit, the technical information available to an RPA aircrew at any moment is extremely vast.

The pilot and sensor operator build situational awareness on their overall battlespace and the specific target using the video from their aircraft, digital maps and satellite imagery, video feeds from other platforms, tactical datalink information, and communications via radio, intercom, etc. The time spent building their mental picture varies greatly depending on the situation. While days or more can be spent on a dedicated target, an active shooting engagement on the ground often requires the RPA aircrew to develop situational awareness and be prepared to employ weapons within minutes of arrival on station.[46]

The technical aspects of weapon engagements in RPA are similar to other manned aircraft. The pilot coordinates with the supported unit, gathers details on the target and requested effects, and receives final permission to strike. The sensor operator maintains the camera on the target area, scans the target and surrounding environment, and any possible collateral damage areas. Once approved to employ weapons, the pilot will position the aircraft into the location suitable for attack, select the appropriate weapon and release it towards the target. With a weapon in flight, the sensor operator will maintain the camera on target, including firing a laser that assists in guiding the weapon if required. Both crewmembers watch the video simultaneously on separate screens throughout the engagement.

The weapon impact typically results in a few moments of infrared energy bloom that occludes the entire picture and can generate large amounts of dust and debris that mask the target from a few seconds to a minute or more. Thereafter, a typical crew will watch, in strikingly clear detail, the results of

[46] This distinction may prove important in the psychology of killing via RPA, as some aircrew have been known to find themselves tracking targets for extended periods of time.

their kill and the actions of other personnel on the ground following a weapon engagement. Watching enemy combatants pick up recognizable body parts of their comrades, preparing them for burial, and even viewing the funeral, is not unprecedented in warfare via RPA. It is important to note however, the follow-on actions are situation dependent. While some aircrew may remain on station to view the aftermath, others are shifted immediately to cover the next crisis requiring intelligence or strike support.

This description regarding the RPA weapon-employment experience outlines two important distinctions between MQ-1/9 RPA and manned tactical-aircraft operations: time and picture clarity. RPA can spend days, even weeks, surveying a target area, leading the individual aircrew to develop detailed, even intimate, knowledge of their target and surrounding area before the decision is made to strike. Furthermore, because RPA commonly stay on target following a strike, the crews also witness the aftermath. The second distinction involves picture quality, often resulting in extremely graphic details of the strike. RPA cockpits are not space-limited like manned aircraft cockpits. The RPA crew can view their strike in real time on a 24 inch (or larger) screen in high-definition video. Blood, body parts, and entrails are clearly visible in many post-strike video assessments.

Chapter 3

The Psychology of Killing and the Impact of Distance

> Looking another human being in the eye, making an independent decision to kill him, and watching as he dies due to your action combine to form one of the, most basic, important, primal, and potentially traumatic occurrences of war.
>
> - Dave Grossman

One of war's most unique attributes separating it from everyday activities within a society is the literal 'license to kill' afforded members of the armed forces. In *Just and Unjust Wars,* Michael Walzer lucidly identifies war as a rule-governed activity that grants the right to kill without the civilian concerns of crime and punishment.[1] War does, however, remain constrained by a set of rules and morality that govern both the decision to start a war (*jus ad bellum*) and how people should conduct themselves in the performance of combat (*jus in bello*). In *Ethics, Law, and Military Operations*, David Whetham identifies constraints within *jus ad bellum* and *jus in bello* that separate the application of state-sponsored violence from mass murder.[2] Should a nation and the members of its armed forces adhere to contemporary *jus ad bellum* and *jus in bello* principles, the permission to commit violence and killing is tacitly acknowledged. Perhaps George Orwell phrased it best when commenting on German bomber aircraft flying over his English home during World War II.

---

[1] Michael Walzer, *Arguing about War* (New Haven, CT: Yale University Press, 2004), 41

[2] David Whetham, *Ethics, Law and Military Operations* (New York, NY: Palgrave Macmillan, 2010), 11.

> As I write, highly civilized human beings are flying overhead, trying to kill me…Most of them, I have no doubt, are kind-hearted law-abiding men who would never dream of committing murder in private life…[The pilot] is serving his country, which has the power to absolve him from evil."[3]

While modern Just War practice can exonerate a nation's armed forces from prosecution for killing, individual soldiers remain human beings charged with taking another's life during the contest. Society has, in effect, removed the legal, ethical, and moral hurdles for one person to take another's life during times of war, but the psychological impact on individual combatants steadfastly remains. Just War theory provides no such free pass for the psychological impact of deadly combat for the individuals involved.

Dave Grossman, former Army Ranger turned psychologist and author specializing in the study of killing psychology, instructs that killing brings an intense psychological response for those involved. For the majority of personnel, Grossman claims, the psychological burden of killing is so great that most try not to admit that they have killed in combat.[4] Additionally, killing in combat normally brings intense emotions of guilt.

Grossman's seminal book, *On Killing*, abounds with examples of soldiers becoming guilt-stricken following the taking of life from another human being. Two of *On Killing's* notable examples include a Napoleonic-era British soldier

---

[3] George Orwell, *My Country Right or Left 1940-1943: The Collected Essays Journalism & Letters of George Orwell (Collected Essays, Journalism and Letters George Orwell)* (Boston, MA: Nonpareil Books, 2000), 17.

[4] Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Boston, MA: Little, Brown, 1995), 91.

who felt almost like a criminal following his deed, while a US Special Forces officer in Vietnam dropped his weapon and cried after taking the life of a young enemy soldier who attempted to draw a gun upon him.[5] For most soldiers, Grossman claims, killing another human being is an extremely emotional experience; many are thereafter confronted with a harsh reality of guilt, sadness, and remorse for their personal actions, regardless of the legality or morality of the act within the greater framework of Just War theory. In his work, *Trained to Kill,* psychiatrist Theodore Nadelson agrees on the concept of guilt in the soldier who has taken another's life, stating, "Guilt may return in the form of unwanted memories and regret for the former soldier and also for the nation that shares some of the responsibility."[6] This concept is plainly displayed through the eyes of G.T. Rudge, a seventeen-year-old English private, following his killing of a German soldier during World War I. Rudge states, "This was the first time I had killed anybody, and when things quieted down I went and looked at a German I knew I had shot. I remember thinking he looked old enough to have a family and I felt very sorry."[7]

After studying combat during World War II in both the European and Pacific Theaters, S.L.A. Marshall penned *Men Under Fire: The Problem of Battle*

[5] Grossman, *On Killing,* 87.

[6] Theodore Nadelson, *Trained to Kill: Soldiers at War* (Baltimore, MD.: Johns Hopkins University Press, 2005), 135.

[7] G.T. Rudge quoted in Richard Holmes, *Acts of War: The Behavior of Men in Battle* (New York, NY: Free Press, 1985), 377.

Command, in 1947. There, Marshall describes the uneasiness with killing as the product of societal influences on members of armed forces.

> He is what his home, his religion, his schooling, and the moral code and ideals of his society have made him. The Army cannot unmake him. It must reckon with the fact that he comes from a civilization in which aggression, connected with the taking of life, is prohibited and unacceptable."[8]

Marshall further claims that during World War II, Medical Corps psychiatrists found the fear of killing, rather than being killed, was the most common cause of battle failure in an individual soldier.[9]

Georgetown professor Dr. Nancy Sherman authored *The Untold War: Inside the Hearts, Minds, and Souls of Our Soldiers*, in which she details personal accounts of U.S. service members engaged in contemporary combat operations. One of the most poignant remarks within *The Untold War* flows from Navy chaplain Lieutenant Commander Tom Webber. During Webber's preparation for Operation Iraqi Freedom in 2002, he notes the junior troops in his division had never really seen battle or fired a weapon at another human being and were noticeably apprehensive. Webber states, "So just about [everybody] wanted to know, 'Will God still appreciate me if I have to pull the trigger on another human being'?"[10]

---

[8] S.L.A. Marshall, *Men against Fire; the Problem of Battle Command in Future War* (Washington: Infantry Journal, 1947), 78.
[9] Ibid.
[10] Tom Webber quoted in, Nancy Sherman, *The Untold War: Inside the Hearts, Minds, and Souls of Our Soldiers* (New York, NY: W.W. Norton, 2010), 89.

Before guilt and sadness, however, the typical combat killer actually experiences stages of euphoria, happiness, and satisfaction immediately following the act. In *On Killing*, Grossman claims this euphoric stage is seldom mentioned, but nonetheless experienced, by most soldiers.[11] Historian Richard Holmes, in his work *Acts of War: The Behavior of Men in Battle*, provides several accounts of such rapturous episodes. One such narrative comes from future Field-Marshal William Slim following his killing of a Turk soldier in 1917. Slim states, "I suppose it is brutal, but I had a feeling of the most intense satisfaction as the wretched Turk went spinning down."[12] In another instance, Lieutenant Bill Little provides keen insight into his feelings during his first engagement with a German force on D-Day at the village of Saint Aubin.

> Lo and behold I could see the coalscuttle helmets. They were Germans…The excitement was just fantastic…This was the first time we'd actually hit German soldiers and the exhilaration, after all the years of training, the tremendous feeling of lift, of excitement, of exhilaration, it was like the first time you go deer hunting.[13]

As elation and satisfaction change into guilt and sadness, however, most soldiers add an additional layer of psychological burden upon themselves by wondering if they were sick to enjoy the act of killing in the first place.[14] According to Grossman, for combatants, the euphoric stage is generally brief and quickly overwhelmed by guilt. The sudden transition to this stage,

---

[11] Grossman, *On Killing,* 115.
[12] Holmes, *Acts of War*, 376.
[13] Lt Bill Little quoted in Holmes, *Acts of War*, 376.
[14] Grossman, *On Killing,* 245.

combined with the overwhelming guilt of killing another human being, can result in the killer vomiting shortly after the engagement.[15] *On Killing* further notes that soldiers who engage in close inspection of their kill following the action have an intensified level of trauma.[16] Thereafter, guilt becomes joined with a long-term process of rationalization. Should this rationalization process fail, most killers will suffer mentally and may find themselves afflicted with Post-Traumatic Stress Disorder (PTSD).[17,18]

Much of the research evidence collected on combat veterans strongly supports the notion of trauma following involvement in killing and overall combat exposure. Author and former intelligence officer, Richard Gabriel, examines the high prevalence of mental disorders in *No More Heroes.* Gabriel states that during the 1973 Arab-Israeli war, nearly a third of the Israeli

[15] Ibid, 115.

[16] Grossman, *On Killing*, 111; The levers of psychological trauma for the individual solider engaged in close combat may, in fact, become an important consideration in the modern-day remotely piloted aircraft (RPA) aircrew viewing their aftermath in stunningly clear high-definition video for minutes to hours following the kill.

[17] Grossman, *On Killing*, 167.

[18] PTSD is a significant psychological condition developed after exposure to a traumatic event (e.g., witness or experience events that led to actual or threatened death, injury to others) in which the response involved intense feeling of fear, helplessness, or horror. The condition is characterized by a clustering of symptoms that fall into the categories of (a) a sense of re-experiencing the event (e.g., recurrent and intrusive recollections of the event, distressing dreams of the event, acting or feeling of the traumatic event were recurring, physiological reactivity to cues that resemble an aspect of the event), (b) persistent avoidance of stimuli associated with the event or numbing of general responsiveness (e.g., effort to avoid thought, feeling, or conversations associated with the event, avoidance of activities that arouse recollections of the event, feeling of detachment from others, restricted range of effect, sense of foreshortened future), as well as (c) increased arousal (e.g., difficulty falling or staying asleep, increase in irritability/outbursts of anger, difficulty concentrating, hyper-vigilance, exaggerated startle response).

casualties were caused by psychiatric reasons; and, during World War II, American forces lost 504,000 men due to psychiatric collapse.[19]

Additionally, a 1988 report on over two-thousand American Vietnam veterans published in the *Environmental Research Journal* found that increasing combat exposure directly correlated with elevated levels of PTSD.[20] Follow-up research on Vietnam veterans by Koenen et. al published in the *Journal of Traumatic Stress* found that many Vietnam veterans still harbored PTSD symptoms 30 years after their combat tours.[21] The Koenen study further concluded that combat exposure remains a strong predictor of PTSD severity.[22]

More recent studies continue to sharpen the picture on combat killing and the resultant stress on most soldiers. In 2005, Neta Bar and Eyal Ben-Ari published an in-depth investigative study on Israeli snipers engaged in the Al-Aqsa Infatada during the early 2000s. Bar and Ben-Ari's interview research with Israeli snipers clearly delineates the guilt and remorse characterized in Grossman's and Nadelson's pieces.

> They [snipers] do really important work, really hard, and it's a fact that many snipers after the first time when they kill someone then they come to tell us and that it was not easy for them when they see the man dead, because they see it in a magnified way…After that

---

[19] Richard A. Gabriel, *No More Heroes: Madness and Psychiatry in War* (New York, NY: Hill and Wang, 1987), 4.

[20] B. Snow, J. Stellman, S. Stellman, and J. Sommer Jr. "Post-Traumatic Stress Disorder among American Legionnaires in Relation to Combat Experience in Vietnam: Associated and Contributing Factors," *Environmental Research* 47 (1988): 188.

[21] K. Koenen, S. Stellman, J. Sommer Jr., and J. Stellman. "Persisting Posttraumatic Stress Disorder Symptoms and their Relationship to Functioning in Vietnam Veterans: A 14-Year Follow-Up," *Journal of Traumatic Stress* 21 (February 2008): 49.

[22] Ibid, 53.

> you have those that have nightmares about it, they dream about it at night.[23]

Finally, in a U.S. study of nearly 2,800 Operation Iraqi Freedom soldiers published in the *Journal of Traumatic Stress*, Maguen et al. concluded that killing in combat was a significant predictor of PTSD symptoms.[24] The study further stated that taking a life is a potent ingredient in the development of mental health difficulties.[25] Grossman enlightens on this particular point, claiming that soldiers who are exposed to brutal battlefield conditions, yet are not responsible for killing, do not become psychiatric casualties.[26]

Before the Kill - An Aversion to Killing

The mental trauma human beings experience after killing in combat is most-often preceded by a very strong resistance to kill, fire weaponry, or even engage in hostile actions during war. Grossman claims the resistance to close-range killing is so great among soldiers that many would forgo their own self-defense and defense of their fellow comrades before they would submit to taking the life of another human being.[27] Decades prior, S.L.A. Marshall had developed much of the same theory.

> [Man] has such an inner and usually unrealized resistance toward killing a fellow man that he will not of

[23] N. Bar and E. Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," *Third World Quarterly* 26, No. 1 (2005):138.
[24] S. Maguen, B. Lucenko, M. Reger, G. Gahm, B. Litz, K. Seal, S. Knight, and C. Marmar. "The Impact of Reported Direct and Indirect Killing on Mental Health Symptoms in Iraq War Veterans," *Journal of Traumatic Stress* 23, No. 1 (February 2010): 86.
[25] Ibid, 89.
[26] Grossman, *On Killing*, 53.
[27] Ibid, 86.

> his own volition take life if it is possible to turn away from that responsibility. At the vital point, he becomes a conscientious objector, unknowing.[28]

In *Men Under Fire*, Marshall claims that seventy-five percent of troops will not fire, or persist in firing, against an enemy, regardless of previous training or war experience.[29] Marshall noted that it took dedicated oversight by leadership to ensure soldiers fired their weapons, and even then the task proved extremely difficult. Perhaps, Marshall's superior contributions lie beyond the statistics, however, and instead reside within his individual narratives describing soldiers' action, or lack thereof, on the battlefield. One of these examples is drawn from an incident that occurred with the 184th Infantry Regiment during the 1944 Kwajalein battle in the Pacific.

> We saw two objects floating by, 200 yards out in the lagoon. They looked like the heads of swimming men. From forward of us, there was a spattering of fire which kicked up the water around the objects. The riflemen close around me, there were about ten of them, held their fire. I then turned my field glasses over to them, saying, "Take a look and you will see that those men are wasting their ammunition on blocks of wood." They did so, and within a few seconds they were all firing like mad at the objects. They had found a release in the very information which I had supposed would cause them to hold their fire.[30]

Marshall further noted, "The average firer will have less resistance to firing on a house or a tree than upon a human being."[31] In *Trained to Kill*, Nadelson

[28] Marshall, *Men against Fire*, 79.
[29] Ibid, 50.
[30] Ibid, 77.
[31] Ibid, 78.

largely agrees with Marshall's assertions regarding a soldier's desire to avoid killing. During Nadelson's research on Vietnam veterans, he found soldiers who have killed frequently describe "Passing through a felt resistance, a palpable barrier to killing."[32]

Beyond Nadelson's and Marshall's conclusions, additional statistics and stories abound to paint a picture of mankind's innate resistance to killing. One such example originates from World War II with a fighter-pilot from the 359th Fighter Group in Europe. When speaking of his fellow fighter-pilots, this veteran of over one-hundred fifty combat missions noted extreme differences in aggressiveness among his fellow aviators.

> I came to the conclusion that given an opportunity, there were probably 20 percent or so of our Group pilots on a mission that would aggressively seek combat. Another large block, 60 percent, would, when conditions were right, prove to be moderately effective. Then there were those that were of little use in air-to-air combat, no matter what the conditions of encounter happened to be…When the sporadic air-to-air encounters occurred, one could usually predict which pilots would have seen action and fired their guns.[33]

Official Eighth Air Force records from World War II support this notion of a select few aviators possessing the aggressiveness and skill required to succeed and kill in aerial combat. While approximately 5,000 American fighter pilots flew against the Germans during the war, a scant five percent of them accounted for nearly forty percent of the total German aircraft destroyed, 5,284

---

32 Nadelson, *Trained to Kill*, 47.

33 Mark Kendall Wells, "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992, 105.

in all.[34] Most strikingly, almost 3,700 American fighter pilots, nearly seventy-five percent of the total, failed to score a single victory against the Germans.[35]

In *On Killing*, Grossman paints additional examples of soldiers refusing to fire their weapons from the American Civil War through World War I.[36] Marshall further attributes this phenomenon to lack of realism in training exercises. During training, there are no real bullets flying that could possibly kill a soldier who dares depart precious cover. More presciently, according to Marshall, is the lack of reality in target practice. Marshall states, "In training, the soldier does not have a man as his target. He is not shooting with the idea of killing."[37]

Trauma is not the Sole Reaction to Killing

Given the high incidence of non-firing soldiers, the known issues of psychological trauma following the kill, and the studies documenting PTSD among troops engaged in battle, one may be tempted to assume the only reaction to killing is trauma, even if preceded briefly by feelings of elation as mentioned above. Somewhat surprisingly, killing in combat has also brought to some killers feelings of satisfaction, happiness, and gratification that fails to yield to guilt or remorse. For example, during World War I, Captain Julian Grenfell, a soldier in the British Army, penned personal letters home that

---

[34] Ibid, 106.
[35] Ibid.
[36] See Grossman, *On Killing*, Chapter 2, "Nonfirers through History."
[37] Marshall, *Men against Fire*, 71.

conveyed his happiness with the war and how he adored the fighting.[38] In one such letter, Grenfell, having recently been credited with several German kills, states, "I have never felt so well, or so happy, or enjoyed anything so much."[39] Additionally, *Acts of War* captures the feelings of a former Green Beret recollecting his experiences in Vietnam, stating, "I could kill a [Viet Cong] right now. Being a combat soldier was one of the most rewarding experiences of my life."[40] Bar and Ben-Ari claim this phenomenon is a natural outcome of higher authorities granting soldiers the right to break societies' highest moral code.[41]

In summation, what years of study and literature propose to the current student and practitioner is that most soldiers will attempt to avoid killing a fellow human being. Soldiers who do kill will likely experience moments of elation and happiness, followed quickly by sadness and guilt. Thereafter, unless individual combatants rationalize and come to terms with their actions, they place themselves at much increased risk for years of mental suffering and possibly PTSD. For a small number of killers, the feelings of joy and elation never subside or compete with feelings of guilt. These concepts, however, must be adjusted as the distance between assailants is factored into the equation.

---

[38] Joanna Bourke, *An Intimate History of Killing: Face-to-face Killing in Twentieth-century Warfare* (New York, NY: Basic Books, 1999), 128.
[39] Ibid, 129.
[40] Holmes, *Acts of War*, 380.
[41] Bar and Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," 141.

The Impact of Distance between Combatants

Defining the Types of Distance

The ever-increasing distance between combatants, previously outlined in chapter 1, provides significant impact on the psychology of killing according to leading theories and historical accounts. In *Of Arms and Men*, historian Robert O'Connell provides foundational thoughts on this topic, stating, "It seems reasonable that the destruction of human life should be more abstract and agreeable at a distance."[42] The famous Prussian theorist and strategist Carl von Clausewitz recognized these same aspects of war psychology centuries earlier and briefly noted the changes in warfare from a distance on the individual soldier in *On War:*

> Weapons with which the enemy can be attacked while he is at a distance are more instruments for the understanding; they allow the feelings, the "instinct for fighting" properly called, to remain almost at rest, and this so much the more according as the range of their effects is greater. With a sling we can imagine to ourselves a certain degree of anger accompanying the throw, there is less of this feeling in discharging a musket, and still less in firing a cannon shot.[43]

Distance, however, is not solely built upon the simple measurement of meters, kilometers, or even continents between combatants. A fuller accounting of distance in warfare accounts for both physical and emotional

---

[42] Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression* (New York, NY: Oxford University Press, 1989), 125.
[43] Carl Von Clausewitz and J. J. Graham (trans.) *On War* (New York, NY: Taylor & Francis, 2004), 250.

distance between attacker and target. Dr. Jeremy Haskell, Operational Psychologist for Creech Air Force Base, Nevada, identifies the physical distance exactly as implied in meters and miles, while further breaking emotional distance into cultural, social, moral, and technological sub-categories.[44]

Cultural distancing is a method most commonly used to dehumanize an enemy, effectively making killing in combat easier to accomplish.[45] As examples in this category, Haskell offers U.S. propaganda materials from World War II which intentionally painted racist, demeaning stereotypes of the German and Japanese societies.[46] Additionally, as John Dower recounts in *War Without Mercy,* the leading Japanese stereotype of Americans during World War II was a demon or the devil.[47]

Social distancing, according to Grossman, is closely related to cultural distancing and considers the stratification of societies, providing justification for killing the citizens of another state in the advancement of one's ideals.[48] Using this model, the Italian condottieri, or mercenary soldiers, popular in the renaissance, provide a useful example of social distancing. The act of hiring condottieri, instead of risking citizens of higher social class, provided the Italian government and its people a measure of separation, or distancing, from the eventual death and destruction wrought by their actions.

---

[44] J. Haskell, "Psychology of Remote Combat," PowerPoint Briefing, 2014.
[45] Grossman, *On Killing*, 106.
[46] Haskell, "Psychology of Remote Combat"
[47] John W. Dower, *War without Mercy: Race and Power in the Pacific War* (New York, NY: Pantheon Books, 1986), 236.
[48] Grossman, *On Killing*, 160.

Moral elements that distance adversaries tend to focus on the righteousness of one's cause versus an unjust adversary. An example of the moral element is displayed in President Franklin Roosevelt's famous "Four Freedoms Speech" given to Congress in January 1941.

> Just as our national policy in internal affairs has been based upon a decent respect for the rights and the dignity of all our fellow men within our gates, so our national policy in foreign affairs has been based on a decent respect for the rights and dignity of all nations, large and small. And the justice of morality must and will win in the end.[49]

In his speech, Roosevelt is drawing upon the moral element, the ideal of a higher moral standing in the United States, as reason for the United States to fully expect to fight and win during World War II. In recent conflicts in Iraq and Afghanistan, *On Killing* claims the United States is using a similar moral distancing element to provide motivation for a campaign against terrorism.[50]

Contained within the technology sub-element to emotional distancing is the de-personalization of the enemy through mechanical or electronic means. Viewing a target through a video screen or artificial lens instead of the naked eye provides some measure of emotional distance between attacker and target. In Bar and Ben-Ari's study of Israeli snipers, they note the use of telescopes or field glasses make the shooting appear as if on a computer game or television.[51]

---

[49] Franklin D. Roosevelt, "Annual Message to Congress on the State of the Union," January 6, 1941.
[50] Grossman, *On Killing,* 163.
[51] Bar and Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," 142.

Haskell, in another example, uses the green and black images of the enemy through night-vision devices (NVD) to demonstrate an ability to de-personalize the war via technology.[52]

Physical Distance

Grossman and Haskell both define gradations of physical distance that provide a useful foundation for discussion. For Haskell, "close" distance is defined as an ability to 'see the whites of their eyes' and fully recognize any interaction as decidedly between two human beings.[53] Grossman further details close-range as any kill with a projectile weapon in which the attacker can clearly see and hear the target without mechanical aid.[54] Of note, *On Killing* further details three additional ranges inside close-range; Edged-Weapons Range, Hand-to-Hand Combat Range, and Sexual Range.[55] Each of these ranges brings additional brutality and resistance to killing in the adversary.

The medium-range distance, according to Haskell and Grossman, allows attackers to see their target fall from the weapon employment with the unassisted eye, but they cannot hear their fellow combatant or see the details of any wounds without technological assistance. Grossman further states

---

52 J. Haskell, "Psychology of Remote Combat"
53 Ibid.
54 Grossman, *On Killing*, 114.
55 Ibid, 120-137.

medium-range encounters allow attackers to begin denying their involvement in the killing due to the battlefield's fog and friction.[56]

Finally, both Grossman and Haskell define long-range as a distance which requires the use of technology for an attacker to see the target or the aftermath.[57] Under long-range, Haskell uses the example of World War II strategic bombing raids by Army Air Corps crews.[58] In *On Killing*, Grossman uses both bomber aircrew and artillery crews as examples of long-range distance between attacker and target.[59]

While instructive, neither of these current definitions regarding physical-distance gradations captures the lack of attackers' physical presence in the same general battlefield, or even the same continent, as their target. The advent of warfare using remotely piloted aircraft (RPA), where the shooters remain thousands of miles away from their target, do not expose themselves to the same level of risk as many other combatants, and do not experience the general battlefield environment, requires an update to the definitions of physical-distance gradations for the purposes of this research.

This project separates physical distance into close, medium, and far gradations in much the same vein as both Haskell and Grossman, with significant adjustment to the far gradation. At close distances, attackers can see, smell, touch, and hear their target if desired. Although physical

---

56 Ibid, 111.
57 J. Haskell, "Psychology of Remote Combat"; Grossman, *On Killing*, 107.
58 Haskell, "Psychology of Remote Combat"
59 Grossman, *On Killing*, 108.

interaction is not required, the distances are sufficiently small that either attacker or target can quickly and easily make the engagement a physical encounter between two combatants. This definition is essentially the same as Haskell's previously discussed close distance.

Medium distances push the separation to a point which greatly reduces the chance of physical encounters between adversaries and greatly reduces the ability to use visual and audio senses. Attackers may be able to see their targets with the naked eye, but they require technology to view details. Modern aircrew and artillerymen fall into this medium-distance category. This updated definition of medium-range effectively combines both the medium and far gradations outlined by Haskell and Grossman.

The newly defined far distance encompasses the realm of current RPA combat operations. In the updated far gradation, distances between attacker and target are so vast that lack of physical interaction is guaranteed, at least during the actual attack. Additionally, technology is absolutely required for attackers to view their targets. Finally, the attacker is physically removed from the battlefield, often thousands of miles away, resulting a completely different risk profile compared to combatants deployed into the combat theater, and providing a completely different backdrop to the work/life relationship experienced by RPA aircrew as compared to their deployed counterparts.

The physical distances as first described by Haskell and Grossman and thereafter modified for this research provide an important factor to the psychological response attackers experience following their kill. Glenn Gray, World War II intelligence officer and subsequent author, provides a keen introduction into the physical-distance factor within his 1959 book, *The Warriors*.

> With every foot of distance there is a corresponding decrease in reality. Imagination flags and fails altogether when distances become too great. So it is that much of the mindless cruelty of recent wars has been perpetrated by warriors at a distance, who could not guess what havoc their powerful weapons were occasioning.[60]

Grossman's work, *On Combat*, focuses heavily on the physical-distance factor and its resulting influence on the psychology of killing, but almost exclusively on the aspect of "resistance to killing" by the aggressor.

> Simply stated, the farther away you are the easier it is to kill. Thus, dropping bombs from 20,000 feet or firing artillery from two miles away is, psychologically speaking, not at all difficult (and there is no indication of any noncompliance in these situations). But firing a rifle from 20 feet away is quite difficult (with a high incidence of nonfirers) and in hand-to-hand combat there is great psychological resistance to stabbing an opponent.[61]

Additionally, *On Killing* provides a useful diagram demonstrating Grossman's concept of physical distance between attacker and target and the resulting resistance to killing. In figure 1 below, note the far right side of the diagram where "Max-Range" manned bombers have virtually no resistance to killing. RPA, if included, would be placed further to the right on the horizontal

---

[60] Glenn J. Gray, *The Warriors: Reflections on Men in Battle*. 2d Harper Torchbook ed. (New York, NY: Harper & Row, 1959), 178.

[61] Dave Grossman and Loren W. Christensen, *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*. 3rd ed. (Illinois: Warrior Science Pub., 2008), 203.

axis as compared to Grossman's existing maximum range depiction, reducing, or possibly altogether eliminating, an already extremely low aversion to killing.

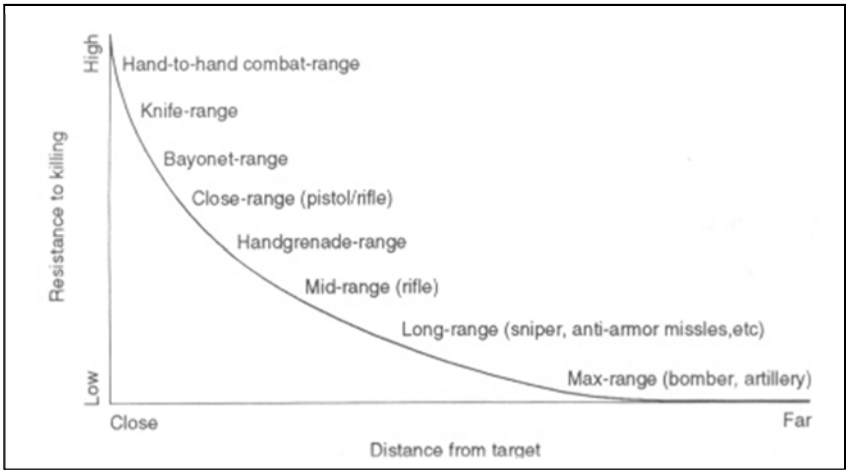


Figure 3.1. Grossman's Physical Distance versus Resistance to Killing concept
Source: Grossman, On Killing, p98.

A further example drawn from *On Killing* claims the distance between aircrew and their civilian targets during the World War II Hamburg bombing provided the mental leverage to execute the mission. Grossman states, "From twenty thousand feet the killer could feel fascinated and satisfied with his work."[62] Holmes offers a closing statement on the discussion of physical distance in *Acts of War*, stating, "The act of killing is often so blurred by the distance separating killer and victim that it seems like a game or is swamped by a feeling of technical satisfaction in marksmanship."[63]

[62] Grossman, *On Killing*, 101.
[63] Holmes, *Acts of War*, 376.

Emotional Distancing

While strong linkages exist between physical distance and the resulting psychological response, emotional distance retains a key role in the overall process. *On Killing* states, "Factors such as cultural distance, moral distance, social distance, and mechanical [technological] distance are just as effective as physical distance in permitting the killer to deny that he is killing a human being."[64] Let us begin the discussion with emotional distancing via technology.

In *Trained to Kill*, Nadelson opens with a biting critique of technology's impact on the psychological aspects of war.

> Technology removes the soldier from personal involvement. It removes the passion from killing, and the soldier may feel less guilty responsibility. There is a concomitant reduction in the emotional consequences of violence… Killing at a distance with missiles or from a gunship can become routinized and performed with little emotional attachment.[65]

During interviews with Israeli snipers, Bar and Ben-Ari noted several instances of technology impacting the psychology of engagements by de-personalizing the enemy for the sniper. One sniper compared it to watching television instead of real life.

> When you look out a window, everything appears less human. Also when you ride in a car and look outside it looks less human…That's what makes a difference between riding in a car or on a motorcycle…It is much, much harder to shoot a man, and the fact that I look at him through a [rifle] sight it is like looking at something on television more or less. Of course, you know to

---

[64] Grossman, *On Killing*, 158.
[65] Nadelson, *Trained to Kill*, 45.

> differentiate between them because this is real, but to look through the sight makes things less human.[66]

The social aspects to emotional distancing allow soldiers to shift responsibility for their actions in combat up their chain-of-command. Gray details this condition in *The Warriors*, stating his amazement at the number of World War II soldiers who put their weight of conscience into taking the soldier's oath. Many of them remarked, "When I raised my right hand and took that oath, I freed myself of the consequences for what I do. I'll do what they tell me and nobody can blame me."[67] Gray further commented that the satisfaction in eliminating the burden of responsibility for one's actions was often plainly visible.

Providing that several emotional sub-categories exist does not necessarily imply that each compounds the other within the combatant's psyche. Holmes demonstrates the opposite result in *Acts of War*, using the thoughts of Captain Neville, a Belgian officer during World War I. When writing about why he fights, Neville states, "People at home seem obsessed with the idea that the army will fight to the death to avenge Belgium. Nothing is further from the truth. We shall go on fighting until we are told to stop."[68] For Captain Neville, the social aspects of combat mattered much more than the moral background of his nation's desire for war.

---

[66] Bar and E. Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," 142.
[67] Gray, *The Warriors*, 181.
[68] Holmes, *Acts of War*, 275.

Moral reasoning, however, has proven to provide significant contributions to a combatant's psychological preparedness and subsequent response to killing. Bar and Ben-Ari state that every Israeli sniper they interviewed for their research, thirty in all, drew upon the justification of a conflict between two peoples as a basis for perpetrating violence.[69] Additionally, the United States has repeatedly relied upon moral reasoning to justify its application of force during more recent conflicts in Bosnia, Iraq, and Afghanistan.

Finally, cultural distancing provides an avenue for killers to dehumanize their enemy, thereby justifying the act of killing. In *No More Heroes*, Gabriel claims dehumanizing the enemy is required to enable the metaphorical 'removal of blood' from a soldier's hands.[70] Gray largely concurs with this assertion, stating, "Most soldiers are able to kill and be killed more easily in warfare if they possess an image of the enemy sufficiently evil to inspire hatred and repugnance."[71] In essence, portraying the enemy as demonic, repulsive, or less than human is designed to stir emotions which make the act of killing easier on both the killer and the society which ordered the violence. Bar and Ben-Ari claim the United States for long periods used cultural distancing as the primary approach to facilitate killing, in World War II, Korea, and Vietnam.[72]

---

[69] Bar and Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," 147-148.
[70] Gabriel, *No More Heroes*, 155.
[71] Gray, *The Warriors*, 133.
[72] Bar and Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," 144.

This examination of the individual components of distance in warfare was a necessary reconnaissance of the factors impacting both historical and contemporary warriors engaged in the act of killing. Our next step is to dive deeper into the consequences of these factors in the killer's psyche with a goal to better understand how distancing has impacted modern warfare prior to the advent of killing with RPA.

Consequences of Physical and Emotional Distancing

The consequences of emotional and physical distancing between combatants is a topic riven with strong opinions. As we shall soon discover, however, strong opinions do not ensure concurrence on this issue. *On Killing* provides a useful lead to this end-game in a description of the bombing raids against Japan and Germany during World War II.

> The pilots, navigators, bombardiers, and gunners in these aircraft were able to bring themselves to kill these civilians primarily through application of the mental leverage provided to them by the distance factor. Intellectually, they understood the horror of what they were doing. Emotionally, the distance involved permitted them to deny it. From a distance, I can deny your humanity; and from a distance, I cannot hear your screams.[73]

Within *The Warriors*, Gray provides an argument similar to Grossman's when presenting the effects of emotional and physical distancing between killer and victim during World War II.

> The sober fact appears to be that the great majority of veterans, not to speak of those who helped to put the weapons and ammunitions in their hands, are able to free themselves of responsibility with ease after the event, and frequently while they are performing it. Many a pilot or artilleryman who has destroyed untold numbers of terrified noncombatants has never felt any need for repentance or regret.[74]

In his writings, Gray is referring to the social distancing performed by World War II combatants. Stanford Professor, Dr. Albert Bandura, extensively covers

---

[73] Grossman, *On Killing*, 101.
[74] Gray, *The Warriors*, 173.

social distancing and the resulting effects in his work, "Moral Disengagement in the Perpetration of Inhumanities."[75]

> Moral control operates most strongly when people acknowledge that they cause harm by their detrimental actions. The second set of disengagement practices operates by obscuring or minimizing the agentive role in the harm one causes…Under displaced responsibility, they view their actions as stemming from the dictates of authorities; they do not feel personally responsible for the actions. Because they are not the actual agent of their actions, they are spared self-condemning reactions.[76]

As an example of the above theory, Bandura uses the Nazi mass-executions of Jews via social distancing which permits the displacement of responsibility above the actual executioners who conducted the killing.[77] Nazi concentration camp staffs were simply 'following orders,' which allowed them to personally divest any acknowledgement of committing atrocities and retain a clear conscience. Grossman, accordingly, claims this emotional distancing reduces, or even negates, an attacker's inhibition to kill.[78]

Additional research strongly supports Bandura's assertions. In "Moral Disengagement in Ethical Decision Making: A Study of Antecedents and Outcomes," Detert et al. analyzed research data on 307 test subjects and came to many of the same conclusions as Bandura theorized a decade earlier.

---

[75] Albert Bandura, "Moral Disengagement In The Perpetration Of Inhumanities," *Personality and Social Psychology Review* 3 (1999): 193-209.

[76] Ibid, 196.

[77] Ibid, 203.

[78] Dave Grossman quoted in Lambér Royakkers and Rinie van Est, "The cubicle warrior: the marionette of digitalized warfare," Ethics and Information Technology 12 (2010): 292.

Detert's analysis determined that individuals who view their behavior as a direct result of authoritative orders may displace any personal responsibility for their actions and absolve themselves of any personal accountability for unfavorable acts.[79] Additionally, Detert et al. concluded that dehumanization can disengage moral sanctions on the attacker because attackers do not identify themselves in the same group as the target.[80] The practical application of this research for the military results in socially and culturally distanced killers who do not identify with the humanity of their targets, place blame for the killing on their superiors, and thus are at much elevated risk for conducting atrocities due to their personal mental disengagement from the reality of their actions.

An additional consideration meriting discussion beyond 'my boss told me to do it' social distancing is lack of locus of control; meaning people who feel they have no control over the situation and their overall environment. Reducing locus of control provides a further measure of social distancing and assists in understanding the complex web of factors resulting in the murders within the Nazi concentration camps. In their research, Detert et al. concluded that locus of control, or the extent to which individuals feel they can impact events within their environment, is directly related to mental disengagement.[81]

---

[79] James R. Detert, Linda Klebe Treviño, and Vicki L. Sweitzer. "Moral Disengagement In Ethical Decision Making: A Study Of Antecedents And Outcomes." *Journal of Applied Psychology* 93 (2008): 384.
[80] Ibid, 376.
[81] Ibid, 384.

Detert suggests those who believe life experiences and outcomes are due to forces outside their control are more likely to disengage and displace responsibility, placing them at higher risk for unethical decision making.[82]

Research conducted by Dr. Linda Trevino and Dr. Stuart Youngblood at Texas A&M University entitled "Bad Apples in Bad Barrels: A Causal Analysis of Ethical Decision-Making Behavior" provides a useful case study into the theories on locus of control and personal responsibility. Trevino and Youngblood used ninety-four college students in their experiment to gauge the effects of locus of control and ethical decision making. Their study conclusively found that ethical decision making was influenced directly by locus of control.[83] Additionally, Trevino and Youngblood found no evidence that vicarious reward and punishment directly supported ethical decision processes.[84] Applying this logic to modern warfare, it appears fear of punishment for committing war atrocities weighs less on the minds of the combatants involved than their personal feelings of power and control of the overall situation. This factor, when applied to Bandura's earlier example of the Nazi concentration camps, demonstrates that those involved in war atrocities may actually know they are at grave risk for prosecution, but their inability to retain a strong locus of control helped prevent them from taking any action.

---

82 Ibid.

83 Linda K. Trevino and Stuart A. Youngblood. "Bad Apples In Bad Barrels: A Causal Analysis Of Ethical Decision-making Behavior," *Journal of Applied Psychology* 75 (1990): 378.

84 Ibid, 384.

Dr. Stanley Milgram provided one of the best, and most controversial, examples of social distancing via chain-of-command and locus of control effects during his obedience-to-authority experiments first conducted in the 1960s.[85] Milgram's experiments included three persons; a Teacher, a Learner, and the Experimenter. While both Teacher and Learner were portrayed as test subjects, in actuality, the lone test subject filled the role of Teacher during the experiment. Unknown to the Teacher, the supposed Learner test subject was actually an actor. The third participant was the Experimenter, acting as an authority figure to the Teacher.

The Teacher's role was to instruct word-pair associations to the Learner. If the Learner correctly answered a question, the test would proceed to the next word-pair association. If the Learner answered incorrectly, the Teacher's role was to administer an electric shock to the Learner, increasing the voltage for each incorrect answer. In actuality, the Learner was not receiving any electric shocks, but this fact was withheld from the Teacher. The end goal of the experiment was to test how many electric shocks and to which voltage the Teacher would proceed before refusing to continue in the experiment, or continue in the experiment to the maximum voltage possible. Beyond a pre-determined voltage, but before the maximum voltage, the Learner would cease to respond to Teacher instructions, indicating the Learner had passed out from the effects of the shocks. The Experimenter, however, would request the

[85] Stanley Milgram, *Obedience to Authority: An Experimental View* (New York, NY: Harper & Row, 1974).

Teacher continue with the session, including administering electric shocks, despite the lack of communication from the Learner, including possible lethal doses of electricity.[86] While Milgram and other researchers conducted this experiment in varying forms over decades of research and debate on the ethicality and usefulness of such practices, the basic construct remains much the same as described above.[87]

In his subsequent book, *Obedience to Authority*, Milgram details his electrical shock research and draws clear and convincing conclusions regarding the dangers of physical and emotional distancing between attacker and victim that have direct applicability to the study of modern warfare. In the analysis, Milgram polled forty middle-class adults and thirty-nine psychiatrists who did not participate in the experiment to gauge their predictions regarding the outcome. Every one of the forty adults predicted the Teacher would defy the Experimenter and stop the experiment, with the majority predicting the defiance would occur at 'strong shock,' the ninth lowest out of thirty possible shock settings.[88] A similar group of psychiatrists was surveyed, predicting that only one in one-thousand Teacher subjects would continue to the highest possible shock setting.

---

[86] Ibid, 10.

[87] For a critique of Milgram's work, see Gina Perry, *Behind the Shock Machine*. For a modern day replication of Milgram's work, with similar outcomes, see Jeffrey Burger, "Replicating Milgram" in *American Psychologist Journal*

[88] Milgram, *Obedience to Authority*, 27-29.

In fact, Milgram's Teachers demonstrated a continual pattern of completing the experiment to the highest shock setting. During Milgram's first two experiments, where Learners and Teachers were placed in adjacent rooms, the percentage of defiant Teachers was 35 percent and 37.5 percent, respectively.[89] During the next two experiments, where Learners were placed in the same room as Teachers, including a requirement to physically touch the subject in Experiment Four, defiant Teachers were 60 percent and 70 percent, respectively.[90] While defiant Teachers clearly increased in number as victims drew closer in physical proximity to the Teacher, the number of test subjects willing to complete the experiment still far exceeded any predicted behavior by the psychiatrists or average-citizen polling groups.[91]

According to Milgram, the Teacher divests himself of responsibility by acting as the agent of the external authority Experimenter, a useful example of social distancing between attacker and victim.[92] Milgram states the typical response by test subjects who had proceeded deep into the experiment was, "I was just doing what I was told."[93] This oft-repeated rationale led Milgram to dryly conclude, "The person who assumes full responsibility for the act has evaporated. Perhaps this is the most common characteristic of socially organized evil in modern society."[94]

---

[89] Ibid, 35.
[90] Ibid.
[91] Ibid, 29, 35.
[92] Ibid, 8.
[93] Ibid.
[94] Ibid, 11.

Additionally, for the first two experiments, Milgram placed the Learner and the Teacher in adjacent rooms, providing a measure of physical distancing between the two test subjects and reducing the amount of sensory inputs available to the Teacher during the experiment. Finally, Milgram theorizes that devaluation of a victim provides a measure of psychological justification for brutal treatment, and had the Learner been portrayed as a "brutal criminal or pervert", the Teacher would have experienced even greater ease in administering the electric shocks.[95]

While Bandura, Detert, Trevino, and Milgram all paint a clear and convincing picture regarding the impacts of physical and emotional-social distancing between attacker and target, emotional distancing via technology provides significant contribution as well. In *Trained to Kill*, Nadelson claims that technology enables modern warriors to distance themselves psychologically from the results of their actions.

> Technology removes the soldier from personal involvement. It removes the passion from killing, and the soldier may feel less guilt responsibility…Killing at a distance with missiles or from a gunship can become routinized and performed with little emotional attachment and with less hyper-alertness, disturbing thoughts, or dreams experienced afterward.[96]

In *Waging War Without Warriors*, author Christopher Coker claims that technology via computers may transform our understanding of the very nature of war. Coker states, "In the near future, war may no longer be a source of

[95] Ibid, 9.
[96] Nadelson, *Trained to Kill*, 45.

feelings, choices, or emotions."[97] Thereafter, Coker paints a depiction of future warrior-technicians who do not experience the traditional warrior virtues of courage, fear, and endurance.[98] Additionally, Coker claims society is unfinished in its business of reducing the mental interaction with war.

> Instead, we will continue to instrumentalize war still further by diminishing the human factor. And as we continue down that path, we will find ourselves increasingly distant both emotionally and psychologically from other societies who have preserved the warrior tradition or find themselves more in tune with what Clausewitz called its "true nature."[99]

Killers can still be impacted

While the preceding authors provide sound rationale regarding the lack of psychological involvement and psychological response from an attacker separated by distance or emotion, there exists strong evidence that contemporary warriors can still be psychologically impacted by killing despite the distance separating combatants. During World War II, Dr. Roy Grinker and John Spiegel conducted extensive research on the aircrew within 8th Air Force and thereafter captured their results in *Men Under Stress*. Their observations on the psychological responses to killing is insightful.

> Some of the men suffer a great deal of emotional tension on 'the score of having to be involved in an activity associated with so much death, injury and destruction.' In this they are not so much upset by the possibility of their own death, or even of that of their friends, as they

[97] Christopher Coker, *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War* (New York, NY: Columbia University Press, 2013), 174.
[98] Ibid, 174.
[99] Ibid, 82.

> are by the thought that what they are doing is responsible for someone else's death. They cannot tolerate well the guilt of killing, even though in aerial warfare the victims are remote, almost abstract. It is interesting that those chiefly affected by this are the heavy bomber crews, who are farthest removed from their targets.[100]

Additionally, Mark Wells exhaustively researched the psychology of World War II aircrew for his 1992 doctoral dissertation titled, "Aviators and Air Combat: A Study of The U.S. Eighth Air Force and R.A.F. Bomber Command." In his dissertation, Wells takes issue with published works that give an impression of American airmen fighting an impersonal war, claiming his evidence makes the opposite just as compelling.[101]

> Contrary to the notion that airmen were mere technicians, "not concerned with killing and hardly aware of an enemy," the truth is that many had come face-to-face with death and destruction. Countless hundreds, even thousands, saw combat of terrible intensity, and, despite the mind-numbing technical aspects of flying, nevertheless took the time to contemplate the effects of their weapons on other human beings. Bomber aircrew, especially those directly concerned with flying or dropping bombs, even had occasional reservations about what they were doing.[102]

Attempting to explain such phenomena in *An Intimate History of Killing*, author and historian Joanna Bourke states that technology still fails to render the dead faceless because killers will use their imagination to see the results of

---

[100] Roy R. Grinker and John P. Spiegel, *Men under Stress* (Philadelphia, PA: Blakiston, 1945), 35.
[101] Mark Kendall Wells, "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992, 193.
[102] Ibid.

their attack.[103] According to Bourke, attackers who are unable to immediately see the results of their actions often, "Construct elaborate, precise, and self-conscious fantasies about the effects of their destructive weapons."[104] Furthermore, in her review of private letters and diaries of the attackers, Bourke finds a key feature in the extent to which the attackers were not "numbed" to the experience.[105] This leads Bourke to conclude that while technology facilitates mass human destruction, it did little to reduce the attacker's awareness that dead human beings were the final result.[106] Finally, Holmes offers one final counter-point to the negative effects of distance within *Acts of War,* stating, "Even the antisepsis of distance is no guarantee that a sense of clinical detachment will prevail, and the sensations which accompany the first kill can be traumatic."[107]

Given the disparity in thought regarding the true measure of psychological investment attackers retain on their targets, drawing a definitive conclusion regarding the psychological impacts of distance-based killing prior to the introduction of RPAs proves a difficult task. For every historical study and author proposing psychological isolation afforded by distance, another can be found stating that long-distance killers remain psychologically impacted and mentally engaged in their mortiferous work. Instead, it proves an easier task to

---

[103] Bourke, *An Intimate History of Killing*, XVIII.
[104] Ibid.
[105] Ibid, xix.
[106] Ibid.
[107] Holmes, *Acts of War*, 377.

concur with the less-militarized philosopher Dr. Stephen Glover in his work, *Humanity: A Moral History of the Twentieth Century*. Glover states more generally, “When war is conducted at a distance, the psychology is different.”[108] Time now beckons for a transition to RPA-specific discussions on the psychology of killing, where the waters are much less muddied from opposing viewpoints.

Current Proposals on the Psychology of Killing via RPA

What one finds on the topic of killing via RPA is not another endless supply of contradictory arguments regarding the psyche of the crews, but rather a constant drum-beat of claims that emotional and physical distance have completely removed any forethought from the act of killing and negated any possible psychological impact following the act. Existing theories will be presented and discussed using emotional and physical distancing as a framework for inquiry, beginning with emotional distancing via technology.

Technological distancing via RPA - video games in focus

Emotional distancing via technology embedded in RPA often distills into a two-pointed proposal regarding video-game warfare. The first point revolves around violent video games and their ability to desensitize people to horrific acts, violence, and killing. The second point states killing via RPA operations

[108] Jonathan Glover, *Humanity: A Moral History of the Twentieth Century* (New Haven, CT: Yale University Press, 2000), 66.

has effectively turned war into a video game for the RPA aircrew. These two points are often fused to paint a picture of video-game-playing, desensitized RPA aircrew who have no understanding of the actual destruction their weapons are causing. Additionally, even if RPA aircrew did understand the physical destruction their weapons caused, their upbringing and the technical nature of RPA operations has desensitized the aircrew to the point that they are unable to generate any true emotions regarding their actions.

On the first point regarding the ability for violent video games to desensitize human beings to violence, much has been studied, written, and concluded. The most useful video-gaming research relevant to our RPA discussion is found in a meta-analytic review of over 130 research reports and 130,000 test subjects published by Anderson et al. in a 2010 issue of *Psychological Bulletin* titled, "Violent Video Game Effects on Aggression, Empathy, and Prosocial Behavior in Eastern and Western Countries: A Meta-Analytic Review."[109] The article reviews over one-hundred different research studies to test the effects of violent video games on aggressive behavior, aggressive cognition, aggressive effect, physiological arousal, empathy/desensitization, and prosocial behavior.[110] Anderson et al. concluded, "The evidence strongly suggests that exposure to violent video games is a causal risk factor for increased aggressive behavior, aggressive

---

[109] Craig Anderson, et al. "Violent Video Game Effects On Aggression, Empathy, And Prosocial Behavior In Eastern And Western Countries: A Meta-analytic Review." *Psychological Bulletin* 136 (2010): 151-73.
[110] Ibid, 151.

cognition, and aggressive effect and for decreased empathy and prosocial behavior."[111] In short, there is a mountain of evidence demonstrating violent video games have a casual effect on increased aggressive behavior and decreased empathy from game players.

Additionally, recent scholarship demonstrates that violent-video-game players not only act more aggressively, but their perception of what actually constitutes a violent or aggressive act is biased, or polluted, from game playing. Tobias Greitmeyer recently published a journal article on this theory in the *Journal of Experimental Social Psychology*. Gretimeyer concluded that although computer players often deny that playing violent video games makes them aggressive, the act of playing the game leads to a bias in the perception of what actually entails aggressive behavior.[112] Combined with the earlier discussion from Anderson et. al, it appears that violent-video-game players are not only more aggressive than their non-playing counterparts, but they are largely unaware of their aggressive tendencies due to a shift in their own mental understanding of aggression.

On the second point regarding video games, the often stated critique is that RPA aircrew treat war as a video game and also have become completely desensitized to the violence they cause based on the countless hours of video games they play during their personal time. In a 2010 article published in

[111] Ibid.

[112] Tobias Greitemeyer, "Intense acts of violence during video game play make daily life aggression appear innocuous: A new mechanism why violent video games increase aggression." *Journal of Experimental Social Psychology* 50 (2014): 52.

Ethics and Information Technology, authors Lambér Royakkers and Rinie van Est claim operators who have been playing video games throughout their teenage years might not see much contrast between the experience of playing a video game and actually employing weapons remotely.[113] Royakkers and van Est present the new term 'cubicle warrior' to define an operator who controls the deadly robots using visual or technological interfaces.[114]

Royakkers and van Est further assert that RPA cubicle warriors are unaware of the consequences of their decisions. They state cubicle warriors simply target blips on a screen, "Not fully consciously aware that these blips are human beings."[115] Royakkers and van Est contend the outcome of such ignorance results in moral disengagement for the cubicle warrior.[116] Furthermore, they state, cubicle warriors cannot be held responsible for their decisions since they do not understand their environment or their actions. Subconsciously, cubicle warriors think they are playing a video game.[117]

Even those involved with defending the legality of lethal action by the United States have been known to reference killing by RPA as a video game. John Yoo, a President George W. Bush administration legal counselor, stated recently, "[RPA weapon strikes] are kind of antiseptic. So it is like a video game; it's like Call of Duty."[118] Perhaps the most impactful critique specially

---

[113] Royakkers and van Est, "The cubicle warrior: the marionette of digitalized warfare," 289.
[114] Ibid.
[115] Ibid, 192.
[116] Ibid.
[117] Ibid.
[118] John Yoo quoted in Mark Bowden, "The Killing Machines," *The Atlantic*, August 14, 2013.

addressing video games was penned not from a psychologist or historian, but from a United Nations report on targeted killings conducted by the United States.[119]

> Furthermore, because operators are based thousands of miles away from the battlefield, and undertake operations entirely through computer screens and remote audio feed, there is a risk of developing a "Playstation" mentality to killing (quotes in original).[120]

Technological distancing via RPA - beyond video games

Video gaming, however, is not the only critique facing the RPA community regarding emotional distancing via technology. Professor Laurie Calhoun, in her article, "The End of Military Virtue," provides a sharp critique regarding the impacts of technology on the RPA aircrew.

> Killing from vast distances with the click of a computer mouse, an action so trivial and perfunctory that it is used also to send e-mail and shop online, can only have the effect of altogether insulating killers from the reality of what they do…There is a very real sense in which soldiers who kill virtually have entered into the surreal and frightening realm of assassins who do not register the suffering of their victims—because it is not real at all from the killers' own perspective.[121]

---

[119] United Nations General Assembly, Fourteenth session, Human Rights Council. *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions*, prepared by Philip Alston, May 28, 2010.
[120] Ibid, 84.
[121] Laurie Calhoun, "The End of Military Virtue," *Peace Review* 23: 382.

In her article Calhoun continues, “Training [RPA aircrew] to kill in the manner of sociopaths with no feelings whatsoever for their victims because they are but icons on computer screens is a frightening prospect.”[122] Indeed, Calhoun is convinced RPA aircrew have no sense of the reality of their actions, presumptuously comparing the killing of another human being via RPA weapons to shopping on Amazon.com. Calhoun, however, is not the singular voice on this matter.

In *Warrior Geeks*, Christopher Coker’s follow-up book to *Waging War Without Warriors*, he claims RPA aircrew only target systems because, “They cannot actually see, the human and emotional damage for which they may be responsible.”[123] Additionally, in his 2013 article, “A Progressive Defense of Drones,” Kiel Brenna-Marquez claims warfare via RPAs contains serious moral shortcomings due to the physical and emotional distance between adversaries.

> The numbness that results from using machines rather than soldiers to carry out our dirty work is obviously a moral shortcoming of drone warfare. Simply put, when violence is employed more easily, it will also be employed more often. Hence the nightmarish image of an 18-year-old drone operator basically playing video games from the detached safety of a Nevada bunker.[124]

Strawser provides another angle regarding this theme, stating his concern that RPA pilots will not engage in operations, “with the proper sense of propriety or gravitas because they are too removed from the realities of

---

[122] Ibid, 381.
[123] Coker, *Warrior Geeks*, 117.
[124] Kiel Brennan-Marquez, Kiel. “A progressive defense of drones”. May 24, 2013. http://www.salon.com/2013/05/24/a_progressive_defense_of_drones/

combat."[125] The result, according to Strawser, is the virtual video game with an expected increase of *jus in bello* violations.[126] Royakkers and van Est offer the closing thoughts on RPA technological distancing via RPA warfare.

> Unmanned robotic systems represent again another step further in the process of physically and psychologically detaching soldiers from the actual war scene…Remote control war has also removed some of the 'tears' normally involved in killing people…Fighting from behind a computer is not as emotionally potent as fighting on the battle field… The convergence of interfaces used in computer games and military robotics also seems to increase the emotional distance from the enemy.[127]

Social Distancing via RPA

Royakkers and van Est offer additional commentary on the social distancing of RPA aircrew. In their 2010 journal article, they claim cubicle warriors have lost control of their own decisions, referencing a lack of locus of control. The end result, they claim, is RPA aircrew have become "Marionettes of digitalized warfare."[128]

Strawser, however, does offer one counter-point to the problem with social distancing in RPA warfare. In *Killing by Remote Control*, Strawser argues that RPA aircrew are less likely to be called upon to execute illegal orders,

[125] Bradley J. Strawser, *Killing by Remote Control: The Ethics of an Unmanned Military* (New York, NY; Oxford University Press, 2013), 15.
[126] Ibid.
[127] Royakkers and van Est, "The cubicle warrior: the marionette of digitalized warfare," 292.
[128] Ibid, 295.

presumably because so many personnel have direct and immediate access to the RPA mission and the video feed from the battlefield.[129] Additionally, Strawser views the lack of RPA aircrew emotional attachment as a possible benefit, shielding the aircrew from strong emotions such as terror or hatred that have traditionally been a causal factor in war crimes.[130] He states, "Since Unmanned Systems operators have nothing to fear from their enemies, they are better placed to be able to pause and consider the consequences of their actions.[131] This, obviously, is an unequivocal contradiction to Royyakers and van Est's claim that RPA aircrew are nothing more than puppets on a string when it comes to decision-making.

Cultural Distancing via RPA

Regarding cultural distancing, Strawser claims RPA operators are completely alienated from both the enemy they face and the civilians they are charged to protect.[132] The logic behind his reasoning is that RPA aircrew are completely culturally isolated from the target and the surrounding environment, including both friendly and non-combatant personnel. Strawser does acknowledge, however, that *any* remote sensing system, or camera, is unable to communicate the moral reality of people half a world away.[133]

---

[129] Strawser, *Killing by Remote Control*, 95
[130] Ibid.
[131] Ibid, 97.
[132] Ibid, 98.
[133] Ibid, 101.

For their part, Royakkers and van Est provide yet another stinging critique, this one centered squarely on the cultural distancing between RPA aircrew and their targets.

> The socio-technical system conditions the cubicle warrior to dehumanize the enemy. As a result the cubicle warrior is morally disengaged from his destructive and lethal actions. Cubicle warriors would then be conditioned to dehumanize the enemy, to view them as sub-humans or non-humans, so that it is easier to kill…Cubicle warriors lose sight of means and their ethical implications and start concentrating only on the ends or outcomes. [134]

Coker strongly agrees with this assertion in *Warrior Geeks*, stating, "A drone pilot may well be able to see more than any pilot has seen before, but the breadth of vision does not help him see the man within. [Technology] affords him no greater insight into the moral status of the man he has in his sights."[135]

Moral Distancing via RPA

On the topic of moral distancing, Coker claims that since the United States Air Force is training RPA pilots who possess no previous flying experience, the logical outcome will be a risk of, "Moral disconnection from the war itself."[136] Royakkers and van Est push this assertion one step further to include *all* RPA aircrew, not just ones who possess no previous flying experience, claiming, "Moral disengagement limits the cubicle warrior's [ability]

---

[134] Royakkers and van Est, "The cubicle warrior: the marionette of digitalized warfare," 289.
[135] Coker, *Warrior Geeks*, 122.
[136] Ibid, 129.

to reflect on his decisions and thus to become fully aware of the consequences of his decisions."[137]

Strawser finds himself curious about moral distancing and the effects, stating, "Unless it can be shown that unmanned systems operators are typically reluctant to kill and fear the moral and psychological implications of doing so, the argument that it requires moral courage to operate the systems will be unconvincing."[138] The main difference worth noting between the Coker/Royakker claims and Strawser's thoughts is that one clearly has drawn conclusions on the future of war and emotional distancing via RPAs, while the other wonders aloud on the topic, yet is also hesitant to draw definitive conclusions without some semblance of research data or evidence.

Collective Effects of Emotional and Physical Distancing via RPA

Emotional and physical distancing in RPA warfare sets up a serious inquiry on both the aircrew involved in killing and the future character of warfare. Royakkers and van Est recognize, "Unmanned robotic systems represent again another step further in the process of physically and psychologically detaching soldiers from the actual war scene. For cubicle warriors the decision-making context differs strongly from that of soldiers in

[137] Royakkers and van Est, "The cubicle warrior: the marionette of digitalized warfare," 292.
[138] Strawser, *Killing by Remote Control,* 94.

combat."[139] For Coker, RPA warfare has drastically changed the character of warfare and he wonders, "Whether the new branch of war needs either warriors or men in uniform."[140]

Air Force Colonel (Dr.) Hernando Ortega claimed to recognize the psychological changes in RPA aircrew when discussing RPA stress during a 2012 Brookings Institution interview.

> And if you look at what these [RPA aircrew] have, they don't have [stress]. They don't have an over sympathetic discharge of things. They have more of an existential conflict. It's more of a guilt feeling, perhaps, or a did I make the right decision? Could I have -- was this a friendly fire incident? Was it a good outcome? Was it a bad outcome? Could I have done it better?[141]

Finally, in his 2013 book, Strawser mentions reports of posttraumatic stress disorder as empirical evidence suggesting the decision to kill requires moral courage and exacts a personal toll on the aircrew.[142] However, in his research, Strawser also uncovered additional empirical evidence claiming RPA aircrew are 'eager to attack targets' and 'excited to do so.'[143]

Conclusion on RPA Distancing and Subsequent Effects

One finds a summation of the thoughts behind the psyche of RPA aircrew rather easy to compile, yet difficult to explain and defend through dedicated

---

[139] Royakkers and van Est, "The cubicle warrior: the marionette of digitalized warfare," 291.
[140] Coker, *Warrior Geeks*, 116.
[141] H. Ortega, "Combat Stress in Remotely Pilots/UAS Operations," (interview, *The Brookings Institution*, February 3, 2012).
[142] Strawser, *Killing by Remote Control*, 94.
[143] Ibid.

research, analysis, or historical inquiry as has been done with past wars. The vast majority of authors who have compiled their knowledge and opinions on this burgeoning topic clearly find a lack of psychological involvement in killing for RPA aircrew. Almost every author presented here states that RPA aircrew are severely distanced, both physically and emotionally, from the battlefield. If these authors are correct, the end result is an RPA crewman who does not contemplate or question the order to kill before the act is done, never hesitates to kill, and who cannot possibly display any significant psychological response following the act. What we will soon discover, however, is these claims are based primarily on supposition. We currently lack any significant academic or historical research to support a psychological characterization of the RPA aircrew who have employed weapons in combat.

CURRENT RPA PSYCHOLOGICAL STUDIES

In general, psychological studies of combatants, and specifically those who have killed in combat, represent well-tilled soil. Literally thousands of interviews, surveys, and historical inquiries have resulted in a significant amount of literature published on contemporary warfare dating as far back as World World I. While several of the major works on this important topic by Grossman, O'Connell, Nadelson, Bourke, and others are quoted in this research project; literally hundreds of additional studies, journal articles, books, and dissertations are also available. However, on the topic of RPA aircrew psyche, there is much less available for ingestion if one wishes to study the topic and draw definitive conclusions.

2010 Study conducted by USAF School of Aerospace Medicine

The first significant study regarding the psychology of RPA aircrew was begun in 2010 by the United States Air Force School of Aerospace Medicine and led by Dr. Wayne Chappelle and Colonel (Dr.) Kent McDonald.[144] (Hereafter referred to as the "2010 study") Although the study did not directly address psychological aspects of killing and combat exposure by RPA aircrew, it provided useful insight into some of the main psychological stressors facing

[144] Note: The study was begun in 2010 and carried through Jun 2011.

RPA personnel in their duties. The stated purpose of the Chappelle and McDonald study was to:[145]

1. Identify main sources of self-reported occupational stress
2. Use standardized self-report questionnaires to identify rates of clinical distress and post-traumatic stress disorder (PTSD)
3. Compare findings with local non-RPA operator airmen (logistics and support units from the same geographic locations)
4. Identify demographic and occupational stressors that correlate with (or are predictive of) clinical distress and PTSD among Predator/Reaper operators.

For the 2010 Study, Chappelle and McDonald surveyed 670 MQ-1 Predator and MQ-9 Reaper personnel (operators and intelligence personnel) and 751 noncombat airmen using several questionnaires designed to capture demographic data, levels of emotional distress, and PTSD.[146] The resulting data indicated the most common stressors among RPA operators included long hours, shift work, deployed-in-garrison status, poor ergonomic design of the ground control station [cockpit], and sustaining vigilance over large amounts of real-time visual and auditory data.[147]

During their analysis, Chappelle and McDonald found that rates of clinical distress and PTSD were higher among RPA operators (20 percent and 5 percent, respectively) in comparison to non-RPA airmen (11 percent and 2

[145] W. Chappelle, K. McDonald, B. Thompson, and J. Swearengen. *Prevalence of high emotional distress and symptoms of post-traumatic stress disorder in U.S. Air Force active duty remotely piloted aircraft operators (2010 USAFSAM survey results)*. Wright-Patterson AFB, OH: U.S. Air Force School of Aerospace Medicine, 2012, 1.
[146] Ibid.
[147] Ibid.

percent, respectively).[148] Although not a focus of the original research, psychological impacts due to the involvement with death and destruction of enemy combatants were also noted by Chappelle and McDonald.

> RPA operators are faced with participating in life or death decisions of enemy combatants and bearing witness to the consequences of their decisions and operations they surveil. The results of this study support the perception that USAF RPA operators suffer rates of emotional exhaustion and clinical distress above USAF controls and the general population.[149]

In their discussion, Chappelle and McDonald elaborate on this topic, stating, "It stands to reason among line and medical leadership that repeated vicarious exposure and responsibility for deploying weapons in support of combat operations may place RPA operators at elevated risk for emotional distress and/or PTSD."[150] However, Chappelle and McDonald clearly noted that combat-related stressors were not rated as top sources of stress in RPA operators.[151] Thereafter, the USAF School of Aerospace Medicine would attempt to address the issue of RPA combat stress in a separate study published in April 2011.

April 2011 USAF School of Aerospace Medicine Publication

---

[148] Ibid.
[149] Ibid, 18.
[150] Ibid, 3.
[151] Ibid, 1.

The April 2011 USAF publication on RPA operator's combat stress was led by Dr. Wayne Chappelle, Col (Dr.) Kent McDonald, and Amber Salinas, titled, "Psychological Health Screening of Remotely Piloted Aircraft (RPA) Operators and Supporting Units."[152] (Hereafter referred to as the "April 2011 study") The study's stated purpose was to answer operational leadership questions regarding the psychological disposition of its operators supporting combat twenty-four hours a day, 365 days a year. Specifically, the goals were:[153]

1. Determine the rates of clinically significant occupational burnout among Predator/Reaper operators
2. Gain an understanding of the most common and unpleasant occupational stressors (e.g., operational and combat related) among Predator/Reaper operators
3. Compare Predator/Reaper operator scores to those of Global Hawk RPA operators (who do not engage in weapon-deploying missions) and noncombatant airmen who provide support to RPA operations.

The April 2011 study surveyed 600 MQ-1 and MQ-9 operators and intelligence personnel, 264 Global Hawk operators, and 600 noncombat airmen using demographic and occupational burnout surveys alongside a self-reporting questionnaire for stress.

The April 2011 study concluded the main sources of occupational stress in RPA operators were long hours, low manning, shift work, human-machine interface difficulties, geographical location of work, concerns regarding career

---

[152] W. Chappelle, A. Salinas and K. McDonald. *Psychological health screening of USAF remotely piloted aircraft (RPA) operators and supporting units*. Paper presented at the Symposium on Mental Health and Well-Being Across the Military Spectrum, Bergen, Norway, April 2011.
[153] Ibid, 2.

profession and incentives.[154] These conclusions were consistent with the earlier Chappelle and McDonald report that found long hours, shift work, deployed in-garrison status, ergonomic design of the ground control station, and sustaining vigilance were the key factors in occupational stress.

Additionally, the April 2011 study found that, compared to noncombat airmen, MQ-1 and MQ-9 personnel had a higher incidence of emotional exhaustion while levels of cynicism (negative work attitude) and poor professional efficacy were lower.[155] In order to compare MQ-1 and MQ-9 operators against non-weapon-employing RQ-4 operators, the study developed several criteria for combat-related stressors applicable to MQ-1 and MQ-9 operators.[156]

> **Combat stressors:** are defined as those that involve ISR and weapon-deployment missions that are in direct support to combat operations. For many operators, combat-related stressors include (a) precision targeting and destroying enemy combatants and assets where mistakes may come at a high price (e.g., inadvertently killing friendly ground forces and civilians); (b) exposure to hours of live video feed and images of destruction to ensure combatants have been effectively destroyed or neutralized; (c) making critical decisions regarding the identification of enemy combatants and providing effective force protection to ground troops to reduce casualties of friendly forces and civilian bystanders; and, lastly, (d) the unique demand for RPA operators to simultaneously juggle one's war fighter role while

154 Ibid, 8.

155 Ibid, 8-9; The term professional efficacy is used to describe the capability/motivation to perform one's job requirements

156 The RQ-4 is an unmanned, intelligence aircraft that does not carry weapons. For more information, see: http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104516/rq-4-global-hawk.aspx

> having to sustain one's domestic roles and responsibilities.[157]

Relevant to this discussion, Chappelle et. al found no respondents who reported combat-related stressors among the top sources of their stress.[158] MQ-1 and MQ-9 operators were stressed, with 15 percent of them reporting "very" or "extremely" stressed, but according to the surveys, none of the operators were stressed due to combat-related duties. Chappelle, McDonald, and Salinas further noted in their discussion that many MQ-1 and MQ-9 operators may regard weapons deployment and killing as highly stressful events, but not enough to become a main source of occupational burnout.[159]

When comparing MQ-1 and MQ-9 operators to their RQ-4 and non-combat counterparts, the April 2011 study noted a higher incidence of emotional exhaustion for MQ-1 and MQ-9 personnel as compared to non-combat airmen.[160] Interestingly, Chappelle notes, "Despite their higher level of emotional fatigue, as a group such operators continued to experience a more positive impression regarding the nature and impact of their occupational duties."[161] On a practical note, it appears the MQ-1 and MQ-9 operators are more exhausted from the grind of their job as compared to non-operators, but find greater satisfaction in their role than the average non-combat airman.

---

157 Chappelle, Salinas, and McDonald. *Psychological health screening of USAF remotely piloted aircraft (RPA) operators and supporting units*, 2.
158 Ibid, 8.
159 Ibid, 9.
160 Ibid.
161 Ibid.

June 2011 USAF School of Aerospace Medicine Publication

The USAF School of Aerospace Medicine published an additional RPA study in 2011 titled, "Facets of Occupational Burnout among U.S. Air Force Active Duty and National Guard/Reserve MQ-1 Predator and MQ-9 Reaper Operators."[162] (Hereafter referred to as the "June 2011 study") This research, led by Dr. Joseph Ouma, Dr. Wayne Chappelle, and Amber Salinas, had a stated goal of assessing the sources of occupational stress in RPA aircrew and documenting the stress differences between active duty and Air Reserve Component (ARC) units.[163]

This combined active duty/ARC study surveyed 426 aircrew total, 296 from active duty and 130 from ARC.[164] Worth noting, the study focused specifically on RPA aircrew and did not include any intelligence-support personnel as covered in previous research. The results indicated that 26 percent of active-duty personnel were emotionally exhausted, compared to 14 percent of their ARC counterparts.[165] Additionally, the majority of occupational stress was reported to stem from operational stress and not exposure to

[162] J. Ouma, W. Chappelle, and A. Salinas. *Facets of occupational burnout among U.S. Air Force active duty and National Guard/Reserve MQ-1 Predator and MQ-9 Reaper operators*, Wright-Patterson AFB, OH: U.S. Air Force School of Aerospace Medicine. 2011.
[163] Ibid, 1.
[164] Ibid.
[165] Ibid.

combat stressors.[166] Similar to the previous studies, both the active duty and ARC aircrew attributed a large amount of their occupational stress to shift work.[167]

In their closing commentary, Ouma et al. repeated the earlier caution on the lack of combat-stressors as leading causes of stress across the RPA community.

> Such a finding should also be interpreted cautiously when considering individual operators. It is likely that there are Predator/Reaper operators who perceive the deployment of weapons and exposure to live video feed of combat (i.e., destruction/death of enemy combatants and ground forces) as highly stressful even though it is not reported as the main source of occupational stress.[168]

2014 RPA Report in the Journal of Anxiety Disorders

The final study that focused on the RPA community was conducted once again by the USAF School of Aerospace Medicine and published in the *Journal of Anxiety Disorders* in 2014. Titled, "An analysis of post-traumatic stress symptoms in United States Air Force drone operators," the study was authored by Dr. Wayne Chappelle.[169] (Hereafter referred to as the "2014 Study") The objectives of the 2014 Study were:[170]

166 Ibid.
167 Ibid.
168 Ibid, 12.
169 W. Chappelle, T. Goodman, L. Reardon, W. Thompson. "An Analysis of post-traumatic stress symptoms in United States Air Force drone operators," *Journal of Anxiety Disorders* 28 (2014): 480-487.
170 Ibid, 481.

1) Measure the frequency and severity of self-reported PTSD symptoms in USAF MQ-1 and MQ-9 operators
2) Assess demographic and operational predictors for those meeting PTSD criteria.

The 2014 Study surveyed 1,084 RPA operators, finding that "4.3 percent of them endorsed a pattern of symptoms of moderate to extreme level of severity for PTSD." Additionally, the study noted, "Although remote participation in and video exposure to real-time battlefield operations may be perceived to elevate the risk for PTSD, the rates among such operators in this study are on the low end of rates (4-18%) of PTSD among those returning from the battlefield and lower than projected lifetime risk of PTSD for Americans (8.7 percent)."[171]

Additional opinions

Several other authors and psychologists have commented on the psychology of RPA aircrew, but have not proffered the same level of research evidence as the USAF School of Aerospace Medicine. Dr. Ortega, during his 2012 Brookings Institution presentation, stated that combat stress in RPA crews is not PTSD, but instead "more of a guilt feeling."[172] Ortega, however, does not offer any significant supporting data to confirm this assertion. Additionally, in *On Killing*, Grossman claims that in years of research he has failed to find one single instance of refusing to kill from his defined "maximum

[171] Ibid.
[172] Ortega, "Combat Stress in Remotely Pilots/UAS Operations"

distance" range.[173] Grossman further states he has not personally found a single instance of psychiatric trauma associated with killing from maximum distance. For its part, *On Killing* does not provide research data to support either of these statements.[174]

Finally, Haskell states that daily combat exposure is a psychological vulnerability to RPA operators.[175] Haskell, however, does not provide background information on frequency of events, demographics of the crews, or environmental factors that may have contributed to the vulnerability. Haskell clearly recognizes combat exposure as a consideration for RPA aircrew, but has not been provided a clear set of research data to guide the academics or assist in his focus on specific crews or specific events for psychological support.

Current study Limitations and Areas for Further Research

The currently published studies regarding the psychology of RPA aircrew, known individually as the 2010 Study, April 2011 Study, June 2011 Study, and the 2014 Study, contain areas for future research that merit examination. First, within their demographic sampling, the 2010, April 2011, and 2014 studies do not separate RPA aircrew from the RPA support personnel, such as intelligence officers and enlisted members who support the mission. Intelligence personnel have vitally important jobs, but they do not carry the additional psychological burden of actually firing weapons and guiding them to

---

[173] Grossman, *On Killing*, 107.
[174] Ibid, 108.
[175] Haskell, "Psychology of Remote Combat"

the target. There is undoubtedly a critical distinction in experience between *witnessing the kill* and actually *bearing responsibility for killing.* As discussed earlier in this chapter, there is both theory and evidence supporting claims that witnessing killing produces different psychological effects than actually participating in the kill itself. Additionally, intelligence personnel do not execute the same rigorous training regimen or professional development as RPA aircrew, inducing differences in preparation for combat operations and the psychology of killing. These differences may result in intelligence personnel experiencing a higher or lower incidence of emotional trauma compared to RPA aircrew, further impeding any analysis that treats RPA aircrew and intelligence personnel as a homogenous group.[176]

The second consideration regarding the current demographic sampling is the separation of RPA aircrew who have actually employed weapons and killed in combat from those who have no such experience. Without separating those aircrew who have *actually killed* from those who have *never employed*, or only *watched a killing* occur, we find ourselves in much the same discussion as that including the intelligence personnel supporting the mission. Employing weapons via RPA is not such a common occurrence that every aircrew in the community has employed and killed. For example, in three of the squadrons used for this research, only 50 percent, 42 percent, and 64 percent of pilots,

[176] There is already anecdotal evidence supporting this claim. During the interview process with several squadrons, the author was asked to interview intelligence personnel by the squadron leadership. When the author inquired why, the common response was that the squadron had already seen signs of psychological impact in at least one of the intelligence personnel and was curious to learn more about the group.

respectively, had actually employed weapons in combat.[177] Even within this employment group, there exists a smaller subset of aircrew who have never killed in combat. Usually this is due to targeting unoccupied vehicles or buildings, or missing the intended target during a strike. In short, each of the demographic samples from the studies discussed above provide justification for further research which focuses solely on those aircrew who have employed, and killed, in combat to characterize their pre-kill mentality and the resulting psychological response.

Additionally, while Chappelle et al. attempted to characterize the psychological response to combat stressors during several of their earlier studies, their definition of combat stressors was overly broad for application in a dedicated study of those who have actually killed in combat via RPA. (The earlier studies included witnessing killing and transitioning to civilian life as two additional categories under combat stress) In total, the broad definition of combat stressors likely captured additional false-positive responses while the lack of demographic focus solely on killers captured additional negative responses compared to focusing specifically on the psychology of killing via RPA.

One additional angle concerning RPA aircrew psychological response to killing that would benefit from additional research is a deeper investigation into the individual aircrew experiences and their psychological response following

[177] Furthermore, squadrons do not track enemy personnel kills by aircrew, so the only way to truly know if an individual aircrew has killed in combat is to ask the person directly.

weapons employment and killing. Past research methodologies focused primarily on the thoughts and feelings of RPA operators *at the time of survey*. Had an aircrew member actually experienced significant psychological impact following a kill, but subsequently rationalized the event, perhaps the only way to document and characterize psychological response *at the time of the killing* is a detailed survey or interview that focuses on these events from a historical perspective. The average RPA aircrew has been in the community for 3.2 years, while aircrew exceeding 10 years are not uncommon. This temporal spacing of aircrew longevity, coupled with the number of weapon engagements per person interviewed, provides an opportunity for significant time lapse between killing and subsequent research via survey or interview.[178] For this reason, an investigation into the psychological responses of RPA aircrew who have killed should include historical analysis of the subject's previous thoughts and feelings from the time period of the weapon engagements. This method is also similar to the processes used in previous studies of war-veteran psychology, where the researcher conducts post-war interviews with combat veterans to better understand their thoughts and feelings at the time of killing, even though months, and sometimes years, have passed since the actual event.

Furthermore, every weapon employment is a unique event in combat. Each one contains different circumstances of danger to friendlies, number of enemy killed, unintended casualties, collateral damage, type of engagement,

[178] The actual number of weapon engagements are withheld for operational security considerations.

type of weapons involved, and resulting battle damage assessment at a minimum. In more traditional warfare such as soldiers engaging enemy within small-arms range, each of these circumstances provides a separate input to the decision to kill before the act and in the subsequent psychological response. A detailed study of RPA aircrew who have killed in combat should include similar variables for analysis and discussion across the spectrum of every employment, for every aircrew, if we hope to characterize the psychology of killing via RPA in the same manner as done with veterans of more traditional types of combat.

Finally, an investigation into the pre-employment and post-kill psychology of RPA aircrew should be conducted via interviews instead of surveys. Interviews using open-ended questions provide a much greater chance of identifying omitted variables that were not considered during the initial investigation design or captured by standardized instruments.[179] If we are to gain a greater understanding regarding the psychology of killing via RPAs, the aircrew themselves should be subjected to case-study analysis for specific events. Interviews allow for more detail-rich descriptions of the event to be captured than surveys. Finally, an interview stands a much better chance of capturing additional relevant circumstances surrounding the engagement and the resulting psychological impact.[180]

---

[179] Alexander George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, MA: MIT Press, 2005), 21.

[180] An interesting consideration: Contained within this chapter are thirteen quotes from soldiers and airmen who have killed in previous wars. (There are literally thousands more available) Could you visit a library or search the internet and find quotes from thirteen RPA aircrew who have actually killed in combat? The RPA community has been continually

The existing research convincingly demonstrates that RPA operators display a measure of psychological responses to their environment, including occupational exhaustion, distress, and in a small number of cases, PTSD. The community of practice, however, lacks a comprehensive inquiry into the psychological status of the aircrew who have actually employed and killed in combat. Recording and characterizing the data regarding the individual thoughts and feelings of this sub-set of the overall RPA population before, during, and after their killing event(s) will provide a new insight into the psychology of remote warfare that has not previously existed.

Conclusion

This chapter outlined the typical psychological impacts to killing in modern warfare, both before the act and following the kill. Most combatants will attempt to avoid killing a fellow human being, but if they do kill, they will likely experience several moments of satisfaction followed quickly by guilt and sadness. Thereafter, unless killers rationalize and come to terms with their actions, they place themselves at much increased risk for years of mental suffering and possibly PTSD. For a small number of killers, the feelings of joy and elation never subside or compete with feelings of guilt.

Distance, both physical and emotional, undoubtedly impacts the psychology of killing. It appears that soldiers and manned aircraft crews have both experienced a lessening of the psychological impacts of killing and

---

engaged in combat operations for over ten years but next to nothing exists in the form of personal interviews and documentation from those aircrew who have killed.

retained a strong sense of their actions depending on which author and which study one wishes to consult. On the topic of psychological impacts of killing via RPA, the current body of literature is nearly unanimous in its critique of emotional and social distancing. Yet, as this chapter has shown, very little academic or historical research has been tightly focused on this topic. The day has dawned to provide a comprehensive inquiry into the psyche of RPA aircrew who have killed in combat and characterize this form of modern warfare through the eyes and memories of the aircrew executing the mission.

Chapter 4

Research Methodology

Purpose

The purpose of this study is to provide an ethnographic inquiry into the psychology of MQ-1 and MQ-9 aircrew who have employed weapons and killed other human beings in combat. The goal is to characterize modern warfare through the eyes of the personnel conducting the mission, providing quantitative and qualitative analysis on the RPA aircrew who are fighting our nation's wars.

This study is intended to inform the ongoing dialogue regarding the psychology of modern warfare. The results of this research will be beneficial to operational commanders preparing their RPA aircrew for combat operations and the medical community charged with supporting RPA combat operations with flight surgeons and operational psychologists.

Methods

PARTICIPANTS

A total of 113 MQ-1 and MQ-9 aircrew (pilots and sensor operators) participated in interviews across three major commands (MAJCOM), seven different wings, and thirteen squadrons. Each interview participant had employed a weapon in combat, or laser-guided a munition launched from a separate aircraft, onto a target. Two study volunteers had employed weapons in combat, but were positive they had not killed another human being in the process, and were subsequently excluded from the final data analysis and discussion.

Demographic Data

The 111 total aircrew subjects represent approximately 4.3 percent of the MQ-1 and MQ-9 aircrew community of 2,597 personnel.[1] During the interview process, MAJCOM breakdowns across Air Combat Command (ACC), Air Forces Special Operations Command (AFSOC), and Air Reserve Component (ARC) were targeted to remain consistent within the overall 4.3 percent interview percentage for the entire USAF to provide representative sampling across MAJCOMs. Final interview breakdowns across MAJCOM were approximately 4.1 percent of ACC MQ-1/9 aircrew, 4.5 percent of AFSOC MQ-1/9 aircrew, and 4.9 percent of ARC MQ-1/9 aircrew.

[1] Michael Lewis, Headquarters United States Air Force, AF/A3O, email to author, October 3, 2014.

Demographic data collected included duty position (pilot or sensor operator), age, MAJCOM, marital status, whether the subject had children, and number of years of RPA experience. Subjects were also queried on their average weekly hours of video-game playing in the last three months and whether their playing included first-person-shooter games. Interview subjects were asked to detail any prior aircraft or military experience before they joined the RPA community, including providing any details on combat deployments in their previous jobs. Finally, if interview subjects possessed prior manned-aircraft experience they were asked to detail any previous combat deployments and whether they had employed weapons in combat as an aircrew on their previous airframe. Table 4.1 below provides a breakdown of the demographic data on the 111 participants included in the study. Specific definitions for aircrew demographics are also outlined below:

1) **All Participants**: Any MQ-1/9 aircrew who qualified and participated in the study.
2) **Pipeline Aircrew**: MQ-1/9 pilots or sensor operators who have never held another job or qualification in the United States Air Force (USAF) prior to joining the RPA community.
3) **Prior Combat Deployment**: MQ-1/9 pilots or sensor operators who deployed to a recognized combat zone for at least thirty days in a job preceding their assignment in the MQ-1/9 community.
4) **Fighter/Bomber Aircraft**: Self-explanatory.
5) **Mobility/Reconnaissance Aircraft**: Self-explanatory. Includes all manned aircraft not capable of employing weapons.
6) **Manned Aircraft Experience**: Person has served as an aircrew member in a manned aircraft prior to joining MQ-1/9 community.

Demographic Data		
	n	%
Duty Position		
Pilot	60	54%
Sensor Operator	51	46%
MAJCOM		
ACC	75	68%
ANG or AFRES	19	17%
AFSOC	17	15%
Age		
18-25	24	22%
26-30	33	30%
31-34	28	25%
35-39	16	14%
40+	10	9%
Male	107	96%
Female	4	4%
Marital Status		
Single	41	37%
Married	70	63%
Children?		
Yes	48	43%
No	63	57%
Years of RPA Experience		
<1 year	19	17%
1-3 years	42	38%
3-5 years	37	33%
>5 years	13	12%
Combat Deployment prior to joining RPA?		
Yes	61	55%
No	50	45%
Prior Manned A/C experience		
Yes	42	38%
No	69	62%
Pipeline Aircrew	35	32%
RPA Pilots w/mobility or recce A/C experience		
Yes	27	45%
No	33	55%
RPA Pilots w/fighter or bomber A/C experience		
Yes	10	17%
No	50	83%

Table 4.1. Demographic Data

INSTRUMENTS

Participants completed a dedicated interview with an examiner, consisting of demographic questions, historical inquiry into weapons employments, and psychological reactions before, during, and after any kills. Interview subjects and their data were anonymously gathered to increase the likelihood of candid, truthful responses. Study protocol was reviewed and granted exemption through the Air University Institutional Review Board in accordance with 32 CFR 219.1.1 (b) (2) specifically relating to methodology and collection of personally identifiable information.[2]

PROCEDURES

Interview participation was solicited by requesting operational-squadron support to the study through interview volunteers. Once operational leadership agreed to a visit, the examiner would coordinate final details for number of participants (usually 10-15) and visit length (usually 2-3 days). Each squadron solicited volunteers for the study differently, with some 'hard scheduling' specific aircrew to meet with the interviewer, while others relied on the interviewer to arrive and canvass the squadron for interview volunteers. No matter the process, in all cases the squadron leadership had informed aircrew of the impending visit.

[2] Survey Control Number: AU SCN 14-076

Interviews were conducted in either aircrew briefing rooms or offices. All interviews were private with minimal interruptions and consisted of only the research subject and examiner.[3] The examiner took written notes using the questionnaire in Appendix A as a guide. Recording devices were not used due to the restriction on electronic devices in nearly all squadrons that supported this research. The interview subjects were provided a copy of the research protocol for review, but did not sign any acknowledgement due to the anonymous nature of the interviews.

The interviews began with an explanation of the research objective, general overview of the questions, explanation of the anonymous nature of the interview, and a final confirmation of interview subjects as volunteers to participate and their right to stop the interview at any time (all subjects completed the interview in full). Interviews took an average of fifty minutes to complete, with the longest exceeding two hours in length. Typically, more weapons engagements by an interview subject resulted in longer interviews.

[3] Dr. Jeremy Haskell observed several interviews during the beginning of the research period to ensure interview subjects were treated appropriately and the study met the required protocols.

Independent Variables

Independent variables for this research study are categorized under the headings *Man*, *Machine*, and *Mission*. These independent variables were chosen for analysis based on their anticipated utility for quantitative and qualitative analysis regarding the psychological outcomes of killing via RPA.

MAN

Independent variables consisting of demographic and experience data for RPA aircrew were collected for case-study consideration and quantitative analysis regarding psychological response.

1. *Manned-Aircraft Experience*. Although the vast majority of new aircrew accessions in the MQ-1 and MQ-9 community possess no prior aviation experience, there still exists a considerable number of MQ-1 and MQ-9 aircrew with prior experience in manned aircraft. The objective in collecting experience information is to quantitatively examine the differences, if any, regarding the psychological responses between RPA aircrew who possess a manned-aviation background and those who joined the RPA community with no prior aviation experience.
2. *Fighter/Bomber & Mobility/Reconnaissance*. The MQ-1/9 community of pilots with previous manned-aircraft experience can be further broken into aviators with prior fighter/bomber experience and those with mobility/reconnaissance experience. The primary difference between these

two sub-groups is combat roles and weapons employment, or lack thereof. The objective in collecting fighter/bomber and mobility/reconnaissance demographic data is to quantitatively examine the psychological response differences, if any, between these two sub-groups of RPA aircrew. Additionally, each of these sub-groups may further be compared against Pipeline RPA aircrew to identify any psychological-response differences resulting from killing and RPA operations.

3. *Combat Deployment Experience*. The vast majority of RPA aircrew perform their flight duties and killing from the relative safety of stateside operations. However, 59 (53 percent) of the RPA aircrew interviewed for this study had deployed to combat as part of a previous military job, either as part of a manned-aircraft aircrew or in a ground-forces role. These combat deployments place the subject much closer to the battlefield, significantly altering the risk profile and combat experience. The objective in collecting prior combat-deployment data is to quantitatively examine the differences in psychological response, if any, between those RPA aircrew who have previously deployed to combat in any capacity and those who do not possess any combat experience beyond their stateside RPA operations.

4. *Pilot and Sensor Operator Duty Positions*. The pilots and sensor operators who operate the MQ-1 and MQ-9 RPA are initially trained, and thereafter execute, their jobs in slightly different fashions. The pilot corps is composed entirely of rated officers while sensor operators are drawn from the enlisted ranks. Additionally, the MQ-1 and MQ-9 training pipeline contains

variations for each duty position, exposing each to slightly different experiences in preparation for combat duties.

Once established in their combat squadron, pilots and sensor operators each operate under different roles and responsibilities. The pilot is ultimately responsible for the safe, effective conduct of the mission and is the final authority in the crew to employ weapons. Once the weapons are in flight, however, the sensor operator becomes almost wholly responsible for their successful guidance to the intended target. The objective in collecting duty-position data is to quantitatively examine the differences in psychological response, if any, between these two groups of aircrew within the MQ-1/9 RPA.

Machine

1. *High-definition video feed.* While the MQ-1 and MQ-9 currently provide highly detailed and clear video of a target, a recent upgrade to the system has further increased the video quality to 720p high definition (HD) over the originally fielded 480p standard-definition (SD) video. The objective in collecting data regarding the use of HD video is to quantitatively and qualitatively assess the psychological differences, if any, in the crews who have killed using HD video versus those using the original SD picture.

Mission

1. *Target Familiarity*. MQ-1/9 aircrew can spend minutes to days or more tracking specific targets before receiving direction to conduct a strike. One possible impact from tracking specific targets for an extended period of time is development of high levels of familiarity, or even emotional closeness, to the targeted individuals. During the interview process, subjects were asked to describe their familiarity with any targets they struck. If interviewees stated they had tracked a specific target for longer than a day, they were then asked if they developed a deep personal knowledge, or intimate connection, to the target, given the length of time they had tracked it. The objective of collecting this data was to quantitatively and qualitatively express the correlation, if any, of tracking a target for an extended period of time then striking and killing that target.
2. *Collateral Damage / Unintended Casualties*. MQ-1/9 aircrew experience a variety of missions and strike situations. While no aircrew interviewed for this project stated they ever intentionally targeted non-combatants or non-approved targets, several aircrew stated their strikes resulted in accidental damage (collateral damage) to structures, equipment, and unintended personnel. Additionally, during the interview process, it became clear that strikes *near* unintended personnel, structures, or equipment also resulted in psychological responses in the RPA aircrew.

Aircrew were queried on their experiences regarding both *near* and *actual* collateral damage and if they had experienced either, they were further queried on the details and their psychological responses to the event. The objective of collecting this data was to qualitatively and quantitatively assess the psychological response, if any, of MQ-1/9 aircrew who have conducted strikes that resulted in near or actual collateral damage or unintended casualties.

3. *Friendly forces in Danger*. While MQ-1/9 aircrew are physically separated from the battle, they often support ground forces directly engaged with enemy forces. During these engagements, friendly ground forces periodically rely heavily on the MQ-1/9 to find, track, and engage enemy threats in time-critical situations. The objective of collecting data on friendly forces engaged in active engagements versus enemy fighters is to quantitatively and qualitatively assess the psychological responses, if any, regarding MQ-1/9 aircrew supporting these situations.

Dependent Variables

In additional to providing detail-rich accounts of their weapon engagements, interview subjects were asked questions designed to characterize their psychological reaction to killing. These are broadly categorized under the headings of Emotional, Social, and Cognitive responses.

Emotional

Interview subjects were queried on their emotional responses to weapons employment and killing. The primary questions posed were:

1) *Did you experience any pre-strike jitters consisting of elevated heart rate, sweating, feeling extreme hot or cold, or shaking?*
2) *Do you remember having an emotional response after your first engagement? If so, can you describe it? Can you describe how your feelings may have changed among immediately afterward, 1-2 weeks afterward, and 1-2 months afterward? Does the event still bring up emotion today?*
3) *Do you remember having an emotional response after any other weapon engagement? If so, which engagement? What were your emotions?*
4) *Did you feel psychologically prepared for your first engagement? If not, how could you have been more prepared?*

Based upon the interview responses, emotions were categorized in the below tree diagram for analysis. Worth noting, the tree diagram has seven separate reporting categories for each psychological response.

1. Overall emotional response rate
2. Positive response rate
3. Negative response rate
4. Short duration response rate
5. Long duration response rate
6. Short duration disruptive or non-disruptive response
7. Short duration resolved or unresolved response
8. Long duration disruptive or non-disruptive response
9. Long duration resolved or unresolved response

During statistical analysis, long- and short-duration disruptive/non-disruptive and resolved/unresolved categories will be combined, resulting in seven total statistical categories for comparison across *Man* independent variables. The cognitive and social domains will also follow this same methodology.

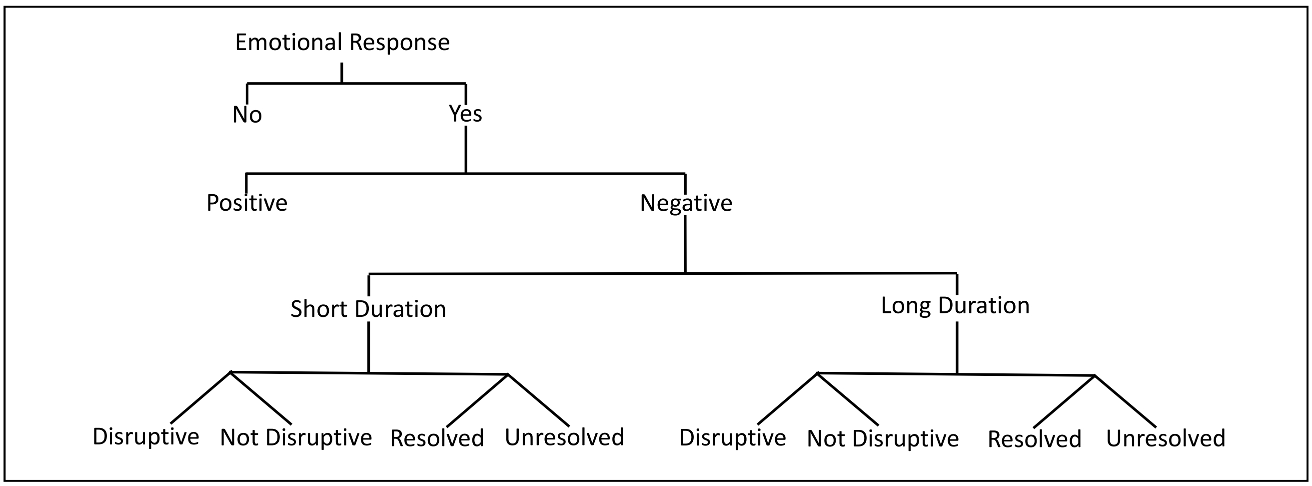


Figure 4.1. Emotional Response Tree Diagram

Social

Interview subjects were queried on their social responses to weapons employment. The primary questions posed were:

1) *Have you noticed changes in your social relationships since your weapon engagements? If so, how?*
2) *Have your family or friends stated they noticed a difference in you following weapons engagement? If so, how did they perceive any changes?*

Social domain responses were categorized in a tree diagram for further categorization and analysis. See figure 4.2 below.

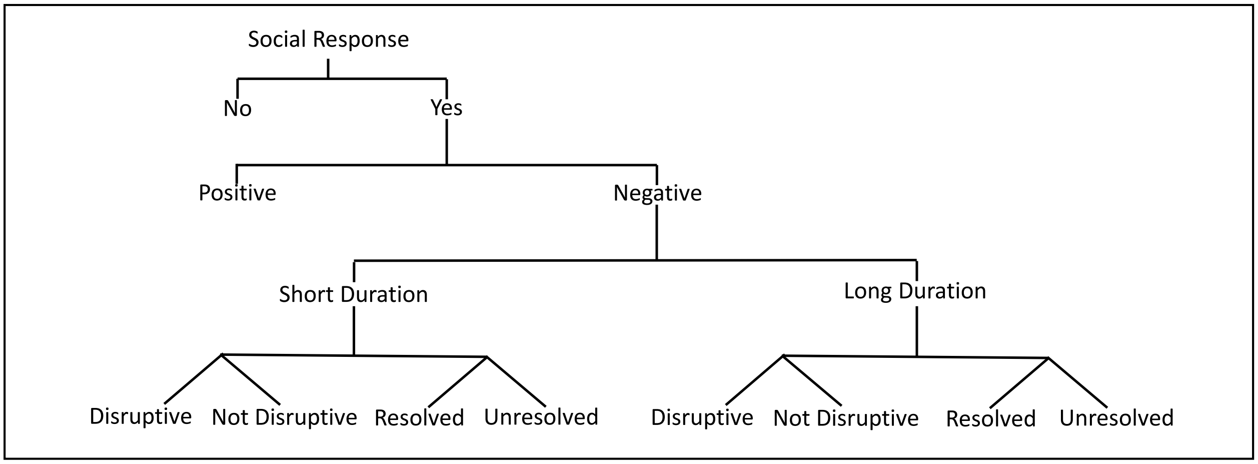


Figure 4.2. Social Response Tree Diagram

Cognitive Responses

Interview subjects were queried on their cognitive responses to weapons employment and killing. The primary questions posed were:

1) *Describe your sense of mission accomplishment following an engagement.*
2) *Do you view those who have employed weapons and those who have not employed in different categories? If so, how are these groups different?*

3) *What do you think about the work you are doing in RPAs? Has your view changed since employing weapons? How do you view RPA operations compared to your previous job?*
4) *Did you approach work differently following your first strike? If so, how?*
5) *Do you feel mentally disconnected due to the distance involved in employing weapons?*
6) *When you see the video in your cockpit, how do you know it's not a video game? Is comparing your job to playing a video game a valid discussion?*
7) *Have you ever opted out of flying or employing? If so, what were the circumstances?*

Cognitive domain responses were categorized in a tree diagram for a categorization and analysis. See figure 4.3 below.

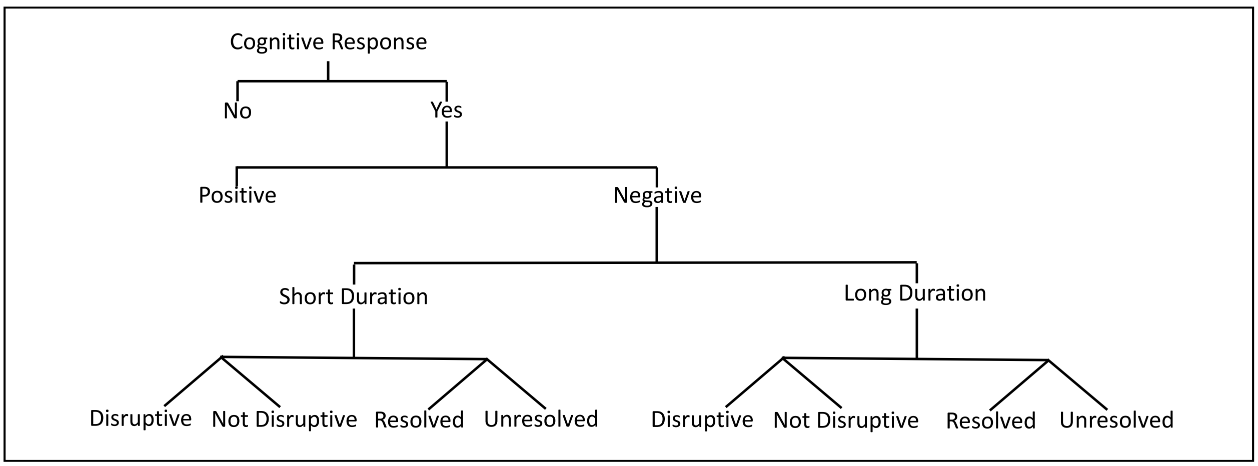


Figure 4.3. Cognitive Response Tree Diagram

Interview Response Categorizations

The following definitions and guidelines were used to categorize interview responses across the emotional, social, and cognitive domains when applying each event to the tree diagram. Of note, subjects were not limited to a single branch of the tree diagram. It was possible for a subject to report both positive and negative responses from the same event, long and short-duration responses from the same event, disruptive and non-disruptive outcomes from the same event, and resolved and unresolved issues from the same event. Additionally, positive responses were not further diagrammed for duration, disruption, or resolution. However, several positive responses were notable for amplitude and duration and will be discussed further in the quantitative analysis section.

1. **Duration:** Psychological responses lasting longer than 48 hours were categorized as long duration. Responses lasting shorter than 48 hours were categorized as short duration.

2. **Significance:** Pronounced response in intensity above routine daily occurrence(s).

3. **Disruptive.** Disruptive determinations describe the behavioral response of subjects across the emotional, social, and cognitive domains. A response was categorized as disruptive if subjects reported functional impairment in their work or social environments caused by the aforementioned psychological response. For example, subjects that reported becoming socially distant with family and friends following a strike were categorized under socially disruptive, while subjects that

became sad but continued to function normally in their social and work environments were categorized as emotionally non-disruptive.

4. **Resolved/Unresolved.** Negative psychological responses were categorized as resolved or unresolved based upon whether the subject felt they had mentally recovered from their event. Unresolved responses encompassed situations where the subject was still actively seeking professional or spiritual help due to their issues or felt they had not returned to their previous psychological state prior to killing due to an inability to rationalize or process the act of killing.

Data Analysis Approach

Quantitative Analysis

This study analyzes the impact of independent variables of *Man*, *Machine*, & *Mission* on the dependent variables: Cognitive, Social, and Emotional responses. The goal of this analysis is to identify correlations, if any, between previous life experiences, types of RPA missions, type of RPA video feed, target familiarity, and the psychological responses of killing via RPA.

Between-group variances will be measured for the *Man* independent variables of duty position, previous manned aircraft experience, and previous combat deployment experience. Additionally, between-group variances will be measured for the *Machine* and *Mission* independent variables of high-definition video, target familiarity, collateral damage, and threats to friendly forces independent variables.

Qualitative Analysis

Case methodologies are used in this project to take advantage of their capability to provide heuristic identification of new variables and causal mechanisms in the psychological responses to killing via RPA that may not be readily available or apparent via statistical analysis.[4] Within-case analysis and cross-case comparisons will be used, where appropriate, to develop inferences regarding the psychology of killing via RPA.

Controlled case-comparison methods will not be applied within this project due to the expected utility from previously applied statistical methods across a far greater number of cases. Given the number of interview subjects and the intense focus on specific independent and dependent variables for analysis, any explanatory powers derived from controlled case-comparison between specific cases in this project is not expected to exceed the correlations that could have been derived through statistical methods.

Study Limitations

This study has several limitations worthy of consideration. Although the interviews were targeted for a representative sampling of MQ-1/9 aircrew

[4] Alexander George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, MA: MIT Press, 2005), 20-21, 29.

across the entire RPA enterprise, we cannot state for certain the sample data properly represents the entire MQ-1/9 aircrew community. Additionally, there may exist some selection bias in the surveyed individuals due to the volunteer nature of the study and the research topic. This project did, however, try to minimize selection bias by using interview results anonymously and repeatedly stating this feature of the project to potential interviewees. Moreover, the risk of squadron leadership providing their 'best' or 'worst' interview candidates as volunteers to the study was largely alleviated by how the interviews were scheduled. Given the extreme operations tempo in the MQ-1/9 community, nearly all interviewees were chosen with minimal notice based upon nothing more than their ability to break away from their primary job for an hour to spend with the examiner. From the examiner's point of view, scheduling availability was seen as the number one determinant of interviewee selection (if a possible candidate had actually employed in combat), above any other consideration.

This study may also contain omitted-variable bias. If present, omitted-variable bias will hamper the ability to draw proper correlation among the independent and dependent variables during statistical analysis. However, if omitted-variable bias is present, the case methodologies, coupled with the open-ended approach to the interviews themselves, should provide an opportunity to identify additional variables for consideration.[5]

[5] The independent and dependent variables chosen for analysis in this project were developed under consultation with both operational and medical professionals possessing several years of

The lack of access to aircrew who have experienced severe psychological trauma following weapons engagement and thereafter been removed from operational status and possibly retired or separated from the USAF represents a risk to the overall data sample. Dr. Jeremy Haskell, Creech Air Force Base Operational Psychologist, was interviewed to discuss this limitation and the possible study implications. In Haskell's estimation, fewer than 10 personnel have been removed from operational flying duties in the MQ-1/9 over the past four years in Air Combat Command due to psychological trauma associated with combat-related duties.[6]

Additionally, similar to other historical inquiries, this study is reliant upon the memories of individual aircrew as they recall their experiences and subsequent cognitive, social, and emotional responses. However, unlike the World War II B-17 bombardier who can only revisit the flight experience through recollection, the aircrew in this study could replay their experiences via video and audio playback countless times. MQ-1/9 aircrew are still reliant upon personal memory to recall their cognitive, social, and emotional responses to events, but the details of the events themselves were readily available for review and playback.

Finally, this study originally proposed to use subject age, marital status, whether the subject had children, and video-gaming experience as four

experience in RPA and manned aircraft, including weapons employment in combat environments.

[6] Jeremey Haskell, 432 Wing Operational Psychologist, Creech Air Force Base, Nevada, email to author, October 2, 2014; This number represents approximately 0.2% of MQ-1/9 aircrew who have flown operationally in the last four years.

additional independent variables for analysis. However, during the research process, it became apparent the sheer volume of engagements by each subject and the number of years spent in RPA operations (average 3.2 years per subject), would demand an unattainable amount of data to support the inclusion of these data points as independent variables for analysis. If these four variables were used for statistical analysis, interviewees would have been required to provide their age, marital status, number of children, and video gaming experience *at the time of the engagement*, for every engagement they conducted. In practice, this requirement exceeded the subject's ability to recall this level of detail for every engagement, and this line of questioning added significant time to the beginning of each interview for data gathering. For these reasons, these four questions regarding demographic data were collected on subjects using their *current status* for a temporal reference but were omitted from nearly all subsequent analysis.

Chapter 5

Emotional Domain Results

Introduction

In the ensuing discussion, the psychological reaction of MQ-1 and MQ-9 aircrew who have employed weapons and killed in combat are statistically characterized across the emotional, social, and cognitive domains. Emotional responses, specifically, are characterized according to conscious feelings about self and objects in the environment.[1] Emotional domain responses are gauged against *Man* and *Mission* independent variables regarding aircrew background and mission-specific events. *Machine* independent variables are reported where appropriate but were not found to have a significant impact on psychological responses.

Primary comparisons are made using the following *Man* independent variables:

1. Pipeline aircrew *versus* Aircrew with prior manned aircraft experience
2. Aircrew with no prior combat deployment *versus* Aircrew with prior combat deployment
3. RPA pilots *versus* RPA sensor operators

Additionally, secondary comparisons across *Man* independent variables are used to examine differences between RPA pilots with fighter or bomber-aircraft

[1] Jonathan Turner, *Human Emotions: A Sociological Theory* (London, UK: Routledge, 2007), 2.

experience and RPA pilots possessing prior mobility or reconnaissance-aircraft background.

Finally, interview respondents are quoted to provide additional detail and insight regarding their psychological response. While not as instructive as the case examples, detail-rich interview quotes assist in gaining a deeper understanding of the RPA aircrew engaged in combat operations.

Results

Pre-Strike Jitters

Pre-Strike Jitters are defined as the following:

> Feelings of nervousness and/or anxiety in the minutes preceding or during a weapons engagement, manifested by one or more of the following: shaking of hands, sweating, trouble speaking, feeling extremely hot or cold, increased heart rate, and increased respiration.

Only three of the one-hundred and eleven interview subjects (2.7 percent) denied having Pre-Strike jitters for their first weapons employment; two were pipeline sensor operators and one a pipeline pilot. Although negative responses were received from Pipeline aircrew only, further analysis revealed no statistical significance across *Man* independent variables. Additionally, while designed as a polar inquiry, participant answers to the pre-strike jitter question often developed into detailed discussions of their experiences while employing weapons. Responses include the following:

- "On first strike my hand was shaking so bad that I had a hard time pushing the [cockpit] buttons."
- "I was surprised at how much it impacted me. My hands were shaking. I had a hard time talking. I probably had 1,000 practice shots and now we are actually going to kill someone."
- "I could hardly talk, nothing would come out. I needed a minute to collect myself before we shot because I couldn't really function properly."
- "Adrenalin…every time. As soon as I get the 9-line [strike request from ground forces] the adrenalin starts flowing…every time."
- "I get extremely cold and shaking…every time."
- "If you aren't nervous, you need to go see mental health. Nervousness reminds me that this is real."

First-Strike Emotional Responses

First-strike emotional responses were categorized according to the tree diagram presented in chapter four. An updated tree diagram with accompanying data is presented in figure 5.1 below. Notable features of figure 5.1 include:

1) On the first branch of the tree diagram, participants were restricted to a polar 'yes' or 'no' response regarding whether they experienced any significant emotional response. In subsequent levels of the tree diagram, participants were permitted to report multiple conditions (positive & negative, short & long, etc.).

2) Regardless of level on the tree diagram, percentages reported for each condition are measured against the overall study population of 111 participants.

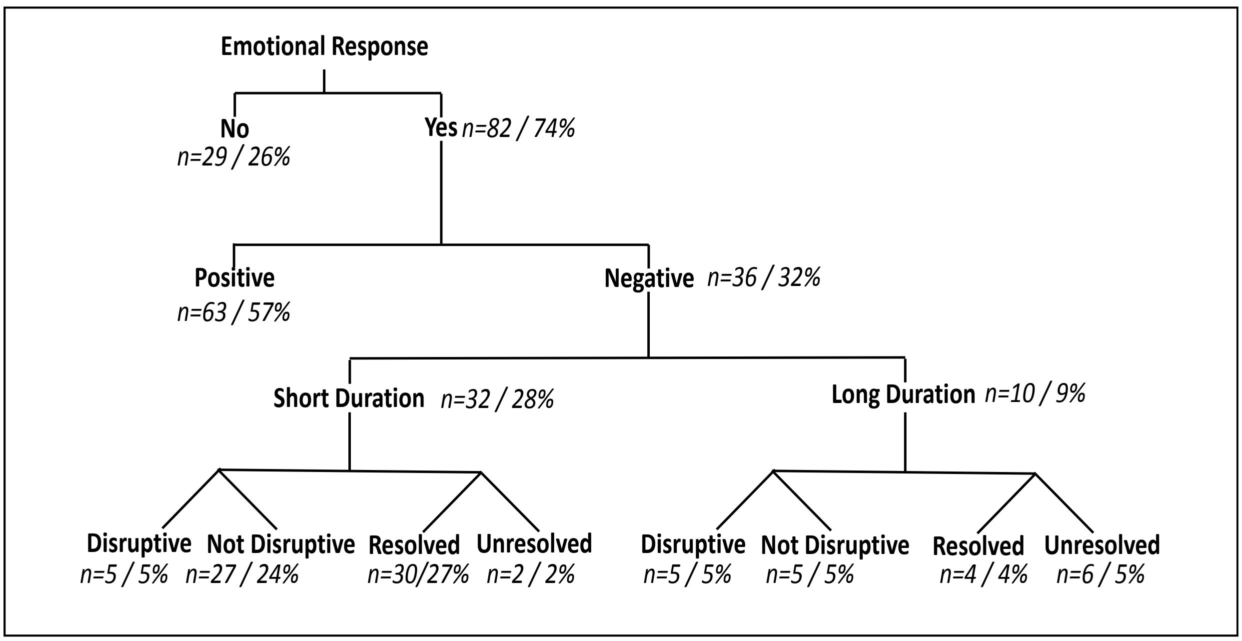


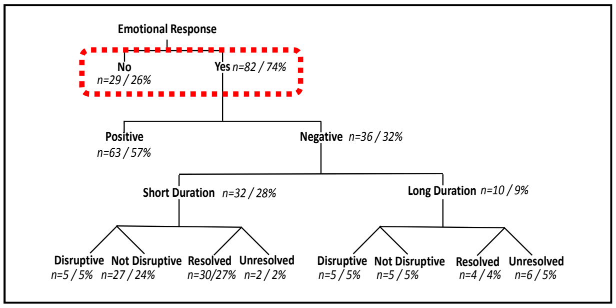
Figure 5.1. First-Strike Emotional Response Tree Diagram

Subject descriptions of their emotions included the following adjectives:

- Positive: happy, proud, excited, and euphoric

- Negative: sad, angry, frustrated, distressed, crying, irritated, sobering, shocked, upset, and feeling bad

Any Emotional Response to First-Strike



Eighty-two interview subjects (74 percent) reported a significant emotional response to their first kill. Figure 5.2 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest percentage of strikes with an emotional response (n=27 / 77.1 percent) while aircrew with a prior combat deployment reported the lowest percentage of first strikes with an emotional response (n=44 / 72.1 percent). However, Chi-square and Fisher Exact Probability Tests revealed no significance between any of the aircrew-background independent variables in figure 5.2 ($\alpha = 0.05$).

Worth nothing, figure 5.2 below is the standard template for independent-variable presentation across *Man* independent variables in the emotional, social, and cognitive domains. The aggregate of all interview responses is presented on the bottom row in the black graph. The remaining *Man* independent variables are displayed in color-coded pairs to assist in distinguishing purposeful variations in aircrew experience for analysis and comparison with the overall study population. Aircrew with fighter/bomber and mobility/reconnaissance experience are not reported on this standard template but will be included for discussion when appropriate.

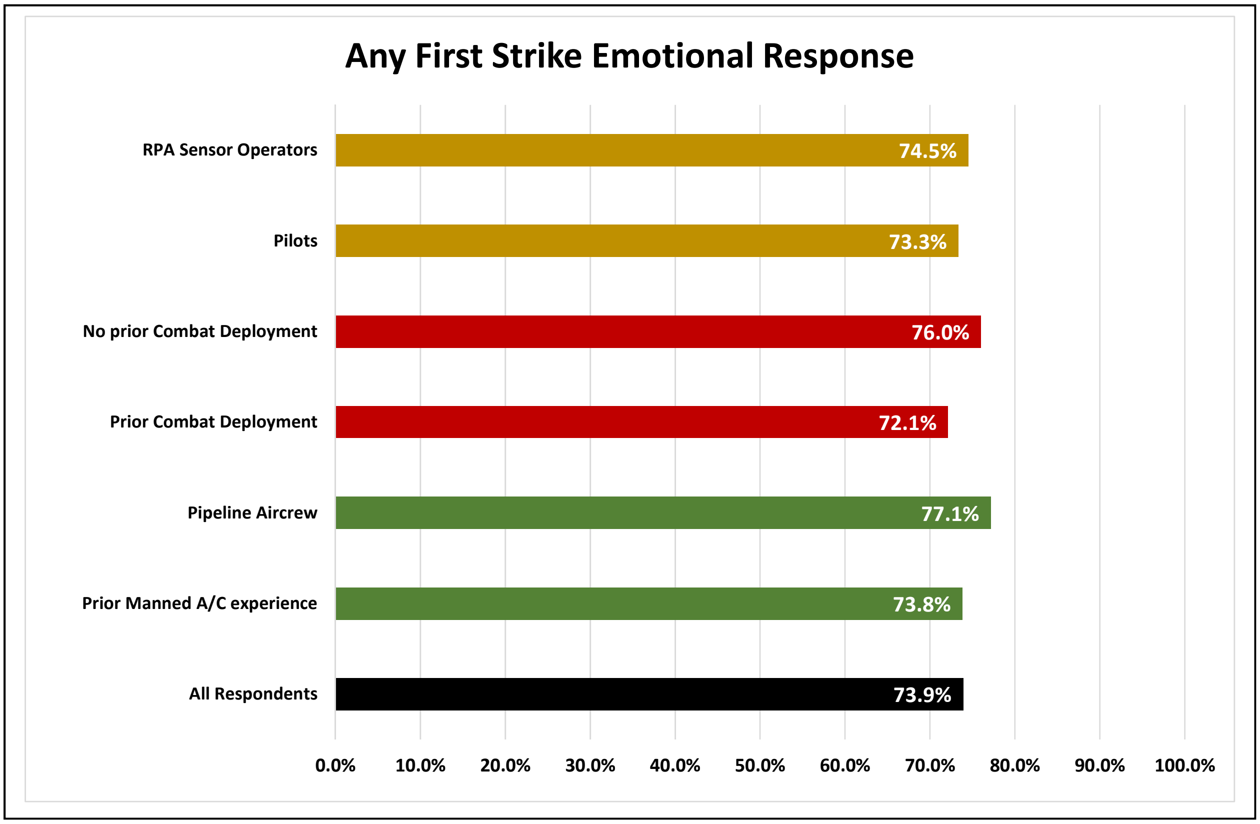
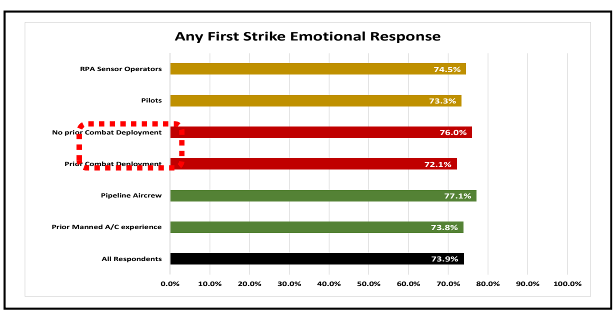


Figure 5.2. First-Strike Emotional Response Rate

Positive First-Strike Emotional Response



Sixty-three interview subjects (57 percent) reported a positive emotional response to their first-strike. Figure 5.3 below depicts these responses categorized across *Man* independent variables. Pilots reported the highest percentage of strikes with a positive emotional response (n=35 / 58.3 percent) while Pipeline aircrew reported the lowest percentage of first-strikes with a positive emotional response (n=19 / 54.3 percent). Chi-square and Fisher Exact Probability Testing revealed no significance between any of the aircrew-background independent variables in figure 5.3 ($\alpha = 0.05$).

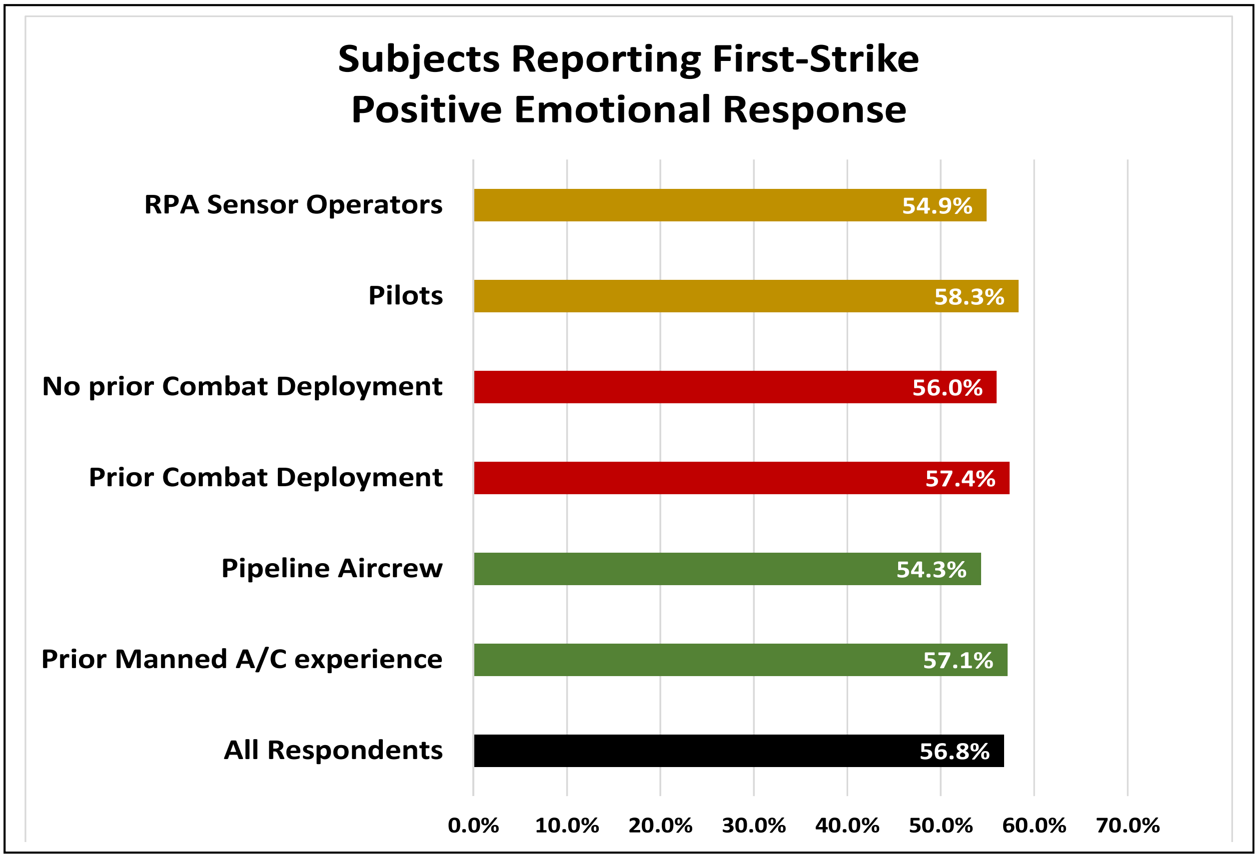


Figure 5.3. First-Strike Positive Emotional Response Rate

First-Strike Euphoric Response

Four interview subjects (3.6 percent) reported euphoria lasting longer than twenty-four hours following at least one of their strikes.[2] All four of the subjects reporting extended euphoria were pilots, but with varying background; two were Pipeline, one possessed mobility/reconnaissance-aircraft background, one possessed a prior non-flying combat deployment. However, unlike chapter three's Captain Greenfell from World War II, who specifically focused on the personal happiness derived from the act of killing itself, the euphoria emanating from these four RPA aircrew was focused on the mission success and eliminating threats to friendly forces as their source of happiness. Their specific interview responses are illuminating.

> - "We were euphoric…High Fives all around…We felt really good that we successfully completed the mission that the ground commander wanted"
>
> - "[The enemy] was setting up an ambush against our ground forces and we got them. I was pumped. Everyone said congratulations. I was so excited I called back to my training squadron and let them know about it."
>
> - "[My first strike] was really gratifying. I had a direct effect in saving lives. In the days afterward, we kept talking about it."
>
> - "My first strike was against enemy forces actively shooting…we killed two of them…I was amped up…had to work out. After a couple days it faded into excitement. I felt validated and that I was good at my job."

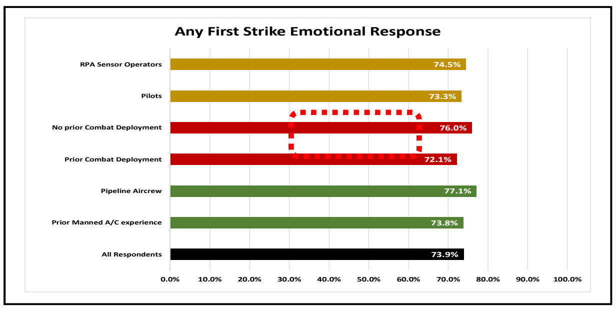
Wants to Shoot More

Closely related to the possibility of euphoria following a kill is the desire to shoot, and kill, more. However, during the interview sessions, only a single

[2] For this question specifically, interview responses were not restricted to first-strike or mission-specific engagements as they were for first-strike emotional response and mission-specific emotional response interview questions.

participant expressed a desire to shoot more, stating, "Killing doesn't bother me…I wish I could shoot more."[3] This interview subject was not one of the four who expressed the elevated euphoria following a strike and instead more closely resembles the Green Beret from *Acts of War* discussed in chapter three who expressed the sentiment, "I could kill a [Viet Cong] right now. Being a combat soldier was one of the most rewarding experiences of my life."[4]

Negative First-Strike Emotional Response



Thirty-six interview subjects (32 percent) reported a significant negative emotional response to their first kill. Figure 5.4 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest percentage of strikes with a negative emotional response (n=13 / 37.1 percent) while pilots reported the lowest percentage of first-strikes with a negative emotional response (n=19 / 31.7 percent). Chi-square and Fisher

[3] This interview subject was a pilot with non-tactical aircraft background and multiple previous combat deployments.
[4] Richard Holmes, *Acts of War: The Behavior of Men in Battle* (New York, NY: Free Press, 1985), 380.

Exact Probability Testing revealed no statistical significance between any of the aircrew-background independent variables in figure 5.4 ($\alpha = 0.05$).

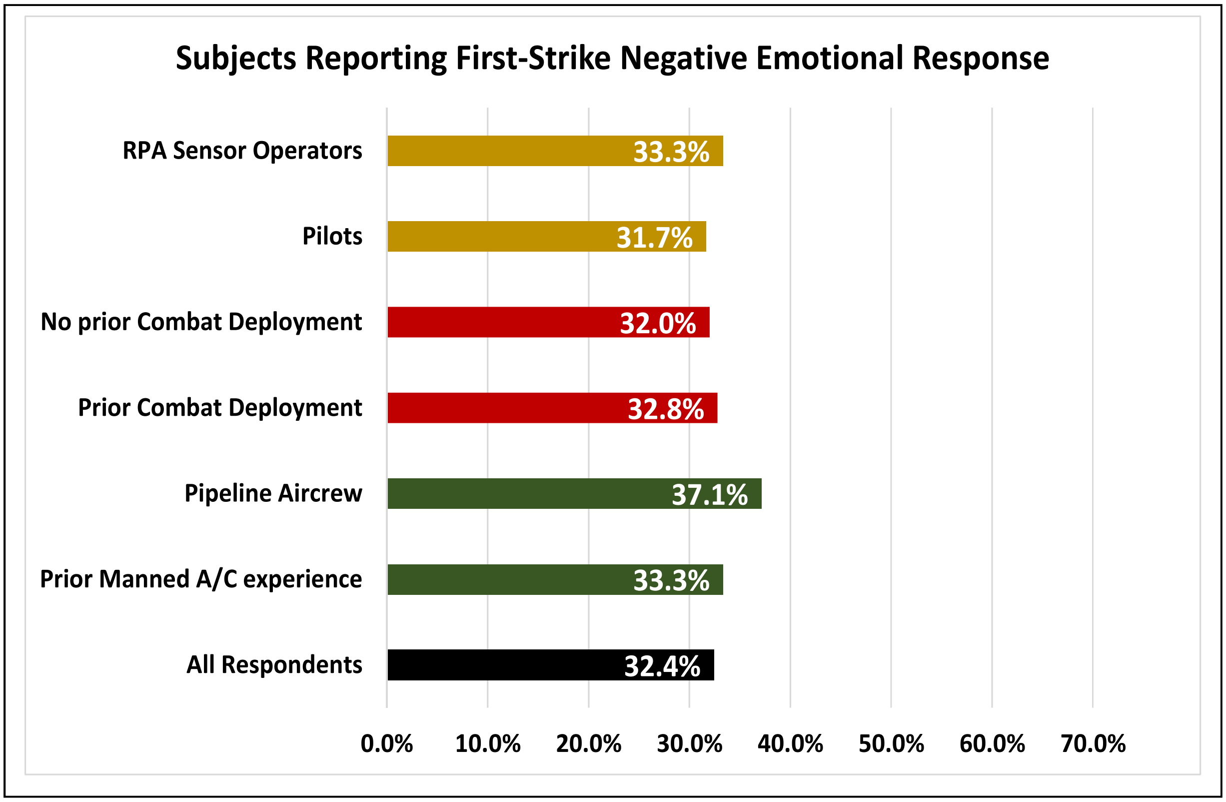
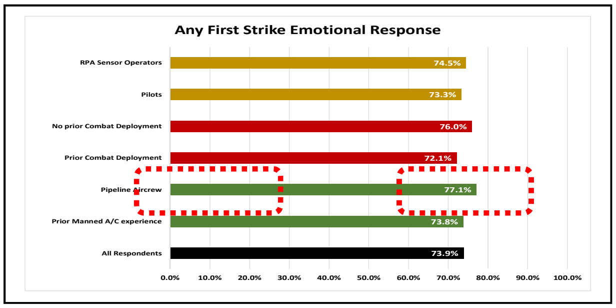


Figure 5.4. First-Strike Negative Emotional Response Rate

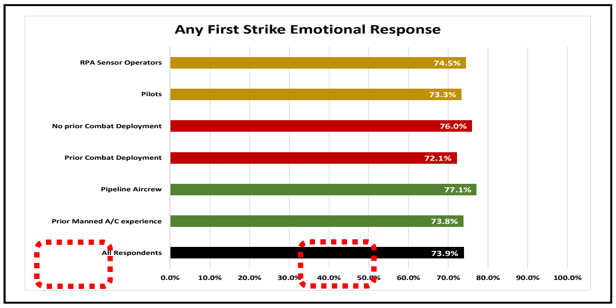
Secondary analysis of the *Man* independent variables revealed prior-mobility/reconnaissance pilots as the demographic experiencing a negative emotional response to their first strike at the highest rate. Mobility/Reconnaissance pilots reported a negative first-strike emotional response for 44 percent (n=12) of their first-strikes, exceeding all other aircrew demographics. While this rate was nearly 50 percent higher than the overall study population and over four times higher than the fighter/bomber demographic rate (n=1 / 10 percent), the results were not statistically significant (p=0.06). This result, however, was heavily influenced by the small sample size of prior Fighter/Bomber pilots in the study.

Short and Long Duration Negative Emotional Responses



Thirty-two interview subjects (28 percent) reported a negative emotional response to their first kill lasting less than forty-eight hours. Ten interview subjects (9 percent) reported a negative emotional response to their first kill lasting longer than forty-eight hours. Across the *Man* independent variables, pilots reported the highest rate of short-duration negative emotions (n=19 / 32 percent); and Pipeline aircrew reported the highest rate of long-duration negative emotions (n=6 / 17 percent). Statistical analysis revealed no significance in the differences across *Man* independent variables for short or long-duration negative emotions. However, trend data indicated sensor operators, Pipeline aircrew, and aircrew without a prior combat deployment reporting long-duration negative emotions at twice the rate of their comparison groups.

Negative Disruptive First-Strike Emotional Response



Seven interview subjects (6.3 percent) reported a negative emotional response that resulted in disruptive behaviors to their professional or personal lives.[5] This statistic includes disruptive behaviors resulting from both short- and long-duration negative emotions.[6] Figure 5.5 below depicts these responses categorized across *Man* independent variables, allowing for only a single instance of disruption per subject to remove any double-counters. Pipeline aircrew reported the highest percentage of strikes with a disruptive negative emotional response (n=7 / 20 percent), while aircrew with a prior combat deployment or manned-aircraft experience reported no disruptive behaviors due to negative first-strike emotions. Fisher Exact Probability testing was significant for Pipeline versus prior-manned-aircraft experience ($p<0.01$) and combat-deployment versus no-prior-combat-deployment ($p<0.01$) comparisons. Additionally, although RPA sensor operators reported a

[5] See chapter four for further definition and discussion on disruptive behavior.

[6] The emotional tree diagram shows ten total instances of disruptive emotional response in the short- and long-duration sub-categories. Three individuals reported in both short and long categories, counting twice. Hence, seven total persons reported disruptive behaviors due to emotional response.

disruptive rate nearly three times higher than pilots, Fisher Exact Probability testing was insignificant (p=0.24).

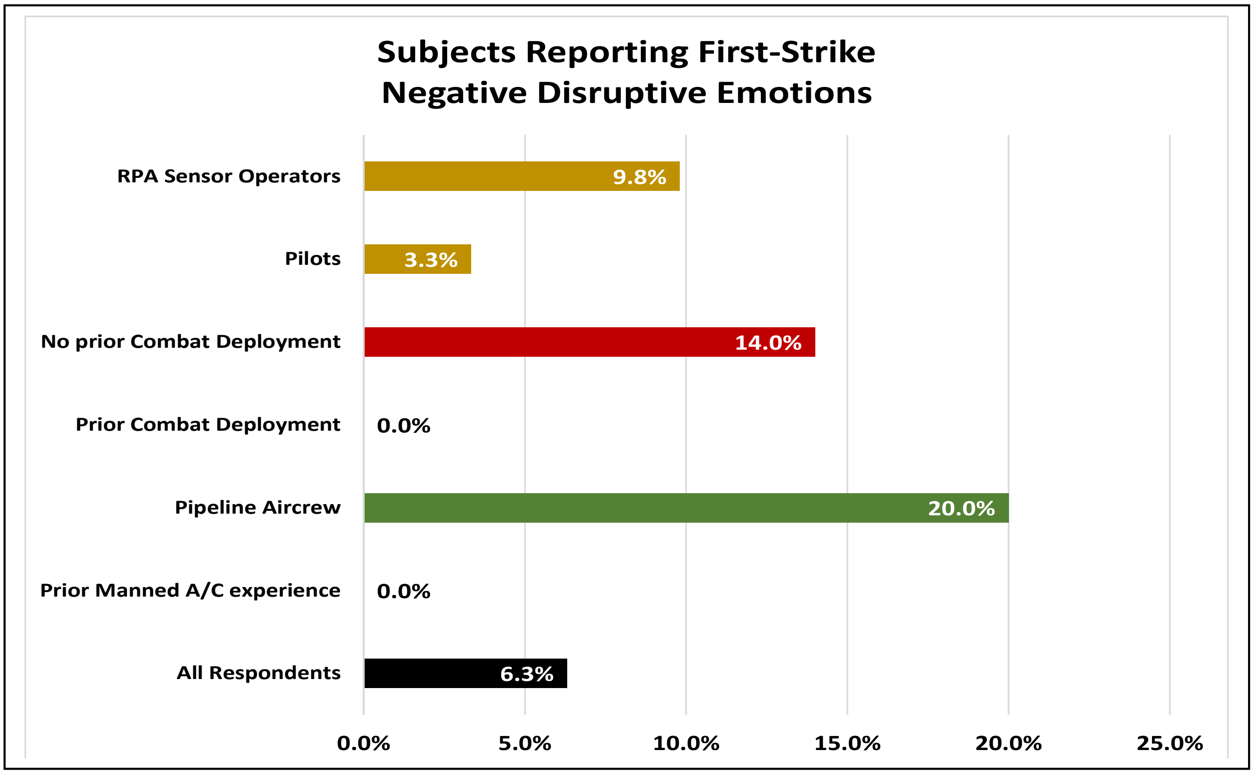
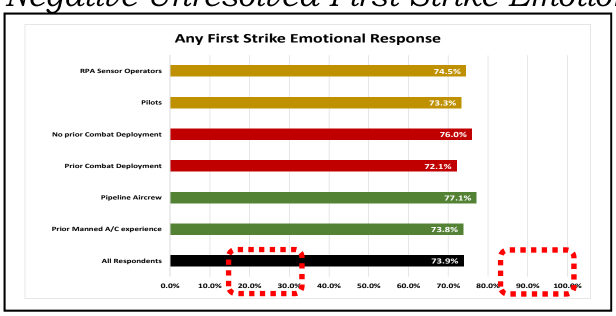


Figure 5.5. First-Strike Negative Disruptive Emotion Rate

Negative Unresolved First-Strike Emotional Response



DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

Seven interview subjects (6.3 percent) reported an unresolved negative emotional response from their first weapons engagement.[7] This statistic combines unresolved negative emotions resulting from both short and long duration.[8] Figure 5.6 below depicts these responses categorized across *Man* independent variables, allowing for only a single instance of unresolved emotions per subject to remove the sole double-counter. Pipeline aircrew reported the highest percentage of strikes with an unresolved negative emotion (n=4 / 11.4 percent). Pilots reported the lowest percentage of strikes with an unresolved negative emotion (n=2 / 3.3 percent). Chi-square and Fisher Exact Probability Tests revealed no significant statistical significance between any of the aircrew- background independent variables in figure 5.6 ($\alpha = 0.05$). However, similar to the disruptive category, sensor operators reported unresolved negative emotions at three-times the rates of pilots, but the results were statistically insignificant.[9]

[7] See chapter four for further definition and discussion on unresolved emotion.

[8] The emotional tree diagram shows eight total instances of unresolved emotional response in the short- and long- duration sub-categories. One individual reported in both short and long categories, counting twice. Hence, seven persons reported disruptive behaviors due to emotional response.

[9] If the pilot and sensor operator groups were doubled in size and the reporting trends continued, both unresolved and disruptive negative emotions would have been statistically significant.

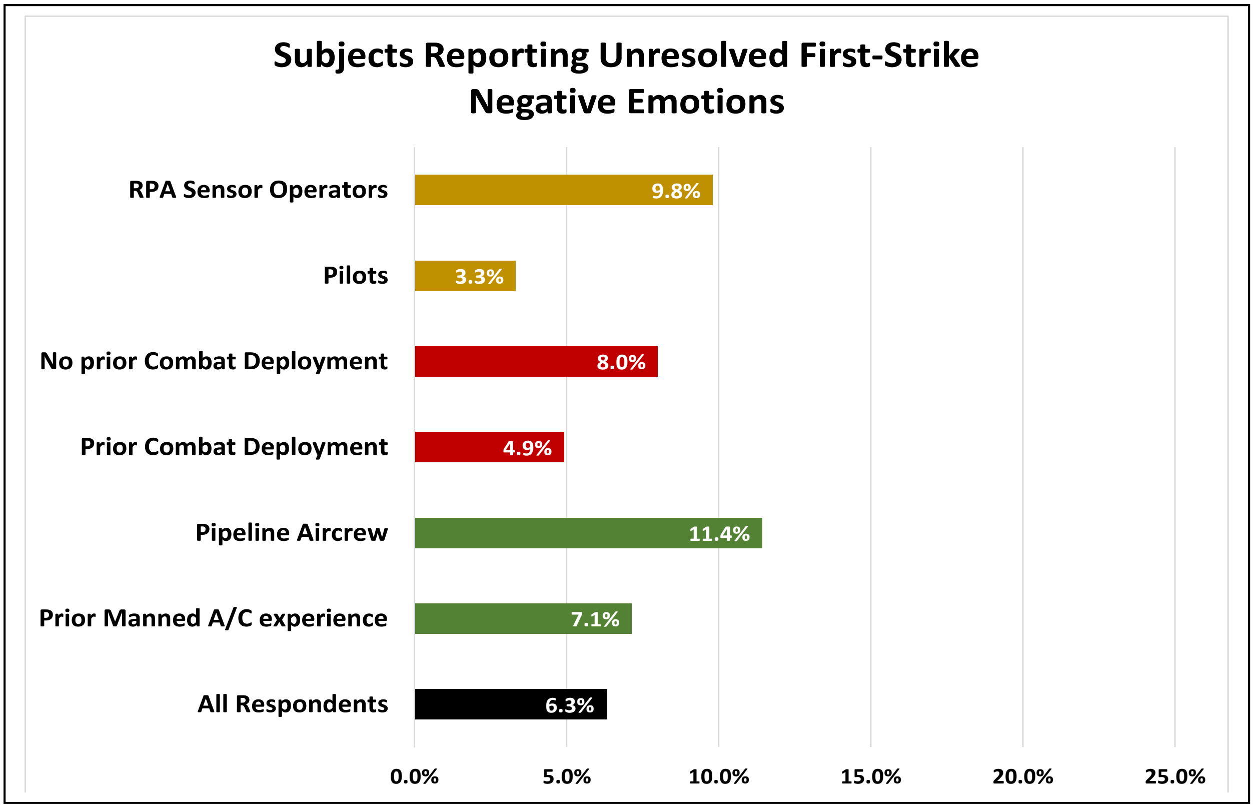


Figure 5.6. First-Strike Negative Unresolved Emotion Rate

Interview Commentary

While figures 5.1 through 5.6 display the statistical results of first-strike emotional responses, actual interview responses provided much greater detail regarding the spectrum of emotions RPA aircrew experienced following their first kill. A sampling of subjects with various emotional response is below.

> - “I came to terms with killing before my first shot…I was ok with it.”
>
> - “I still think ‘What did I do?’ I took a human life. It's pretty crazy, but this is a job requirement. We have to eliminate threats…that's how I cope with it.”
>
> - “It was sobering realizing you were taking someone's life, but knowing they were bad gave me mental buy-in.”

- "This mission can make you a cold-blooded killer whether you like it or not…I thought a lot about the people I killed."

- "I had pride and felt an accomplishment in preventing terrorists from harming American soldiers. After I killed somebody, I thought about it. But I see them as terrorists; so I'm ok with it."

- "I felt bad for him and his family. It's different now that I've taken human life."

- "The moment [I killed someone] is still in my head. It's surreal. I sit and reflect on it. I try to find something to take my mind off it."

- "I thought 'Am I a killer?' I tried to rationalize it…I was OK after a day or two…These are bad dudes."

- "It's not a huge deal as long as the right guy gets hit. These are bad people trying to kill Americans. I understand that I joined a service that broke things and killed people. I trust the U.S. and I trust the JTAC [ground controller]."[10]

- "I don't enjoy killing people. I enjoy being good at my job. Lives hang in the balance based on your decisions. That should bring passion. Buy-in is the most important thing our guys need."

- "I'm capable of killing because it's saving lives."

- "I was glad I killed that guy…he was trying to kill friendlies. But then I started thinking that guy had a family, and maybe he's being forced to do this. It made me think about it more."

- "I was almost in tears when it hit me what we almost did [unintended casualties] that day. It was a sobering reality. Took me a week to get over it…It reminded me we are just men."

- "I felt like a complete failure because we didn't kill all those enemy. JTAC [ground controller] called us later [via phone] and said our weapon helped them break contact [with enemy]. I felt much better."

- "I take no pain and no pride in my work. I am the last cog in a wheel of U.S. national policy. I recognized I crossed a line. Those enemy engaged in hostilities. They needed to be shot."

---

[10] JTAC stands for Joint Terminal Attack Controller. JTACs are typically USAF personnel assigned to friendly ground units. The JTACs role is to provide airpower expertise to the ground-forces commander and serve as the communication conduit between air and ground forces. During Close Air Support missions where RPA or other tactical aircraft are supporting ground forces, pilots typically talk solely with the JTAC to receive mission requests and final strike clearance.

> - "I did my job, did what I had to do. I try to separate the killing from the tactical considerations."

Aircrew Conflicted

In many cases, individual RPA aircrew did not provide polar and consistent responses regarding their emotional reaction to killing across their first or subsequent weapons engagements. The variance in emotional response by the same interview subject raises two items worthy of further analysis. First, 17 of the aircrew (22 percent) that reported an emotional response to their first strike experienced both positive and negative emotions to the same event. For those reporting conflicting emotions, the typical response was a positive one regarding mission success and helping friendly forces juxtaposed with negative emotions for having taken a human life. Some examples of conflicting emotions for the same strike are detailed below.

> - "I was proud and excited at first. After a couple days it wore off…it's a little different when you are alone with your thoughts. If I had the choice, I would not strike again. I'll do it if required, but won't ask for it…I don't feel guilty about what I did, but I would prefer to not kill."
> - "On my first strike I was numb with adrenalin afterward…elated for a job well done. But the next day I became sad. I never doubted they needed to die, but it took me a couple days to recover."
> - "I was happy we helped friendlies. But if we have to take human life, it's regrettable. I feel good for our performance, but never celebrate the killing."
> - "After my first strike, I could not sleep for a couple days. I kept replaying it in my head. But I had a really good feeling about our mission accomplishment."
> - "I felt good about [my first strike]. But, I felt bad for their families. I had thought a lot about killing before I had to do it."

Second, aircrew interviews that detailed more than one weapon engagement often revealed different and conflicting emotions for separate strikes conducted by the same interview subject.[11] Examples include:

- A sensor operator experienced negative emotions on his first strike against enemy personnel. However, on the second strike, the emotions changed to joyous and feeling good after successfully supporting friendly troops under enemy fire.

- A sensor operator was triumphant and excited after his first strike. On the second strike, the initial weapon employment missed the target, requiring a second attack to kill the enemy. After the second engagement, the sensor operator was angry and kept thinking about the engagement for several days.

- A pilot was nearly in tears after his first strike, claiming the mission and errors made during the engagement placed a harsh reality of operations into his mind. But on his second strike, the pilot experienced a completely different set of positive emotions after successfully supporting a group of Marines engaged in a firefight with enemy personnel.

- Following his first engagement, a sensor operator could not sleep. He struggled with killing and eventually sought assistance from a chaplain. However, when asked about his job satisfaction, the same sensor operator stated he 'felt like I've done great things for myself, the squadron, and our nation.'

These two characteristics regarding aircrew responses across the same and subsequent weapon engagements paint a picture of RPA aircrew unshackled by a static emotional response. Negative first-strike emotions did not prevent the shared existence of positive emotions for the same event;

[11] Extensive statistics are not available on this topic because interview subjects were not asked to detail their emotional response to every single weapon engagement, resulting in an incomplete data set. However, a significant portion of the interview subjects (>50 percent) detailed at least one additional strike and their resulting emotions, providing an opportunity for qualitative discussion on this issue.

seemingly polar opposites were not mutually exclusive. Moreover, aircrew emotional responses varied widely when measured from the first to subsequent strikes. This second characteristic became a focus area in the study, introducing the concept of *Mission* independent variables for detailed analysis.

Mission-Specific Emotional Responses

One hypothesis this study sought to test was that mission-specific events occurring during weapons employment result in a significant increase in the psychological response rate for the aircrew involved. *Mission* independent variables include target familiarity, friendly forces in danger, near or actual collateral damage, and near or actual unintended casualties.[12] To test this hypothesis, subjects were queried on their emotional response to these variables in addition to describing their first-strike emotional response.

Figure 5.7 below compares the overall first-strike emotional response rate from figure 5.2 to three distinct mission-specific events.[13] A similar design is presented for the standard template of emotional response in the mission-specific spectrum. First-strike emotional-response rate, minus covariates with mission-specific events, are shown on the bottom row of figures 5.7 through

[12] See chapter four for further definition and discussion on *Mission* independent variables.
[13] Covariate analysis of the first-strike adverse emotional responses and Mission-specific emotional responses yielded nine Mission-specific emotional responses that occurred *simultaneously* with the aircrew's first strike, requiring a reevaluation of first-strike emotional responses to address the covariance. This necessary reevaluation explains the differences in First-Strike emotional response rate published in Figures 5.2 (69.4%) and 5.7 (66.7%).

5.10. *Mission* independent variables are then displayed above the first strike response rate for direct comparison.

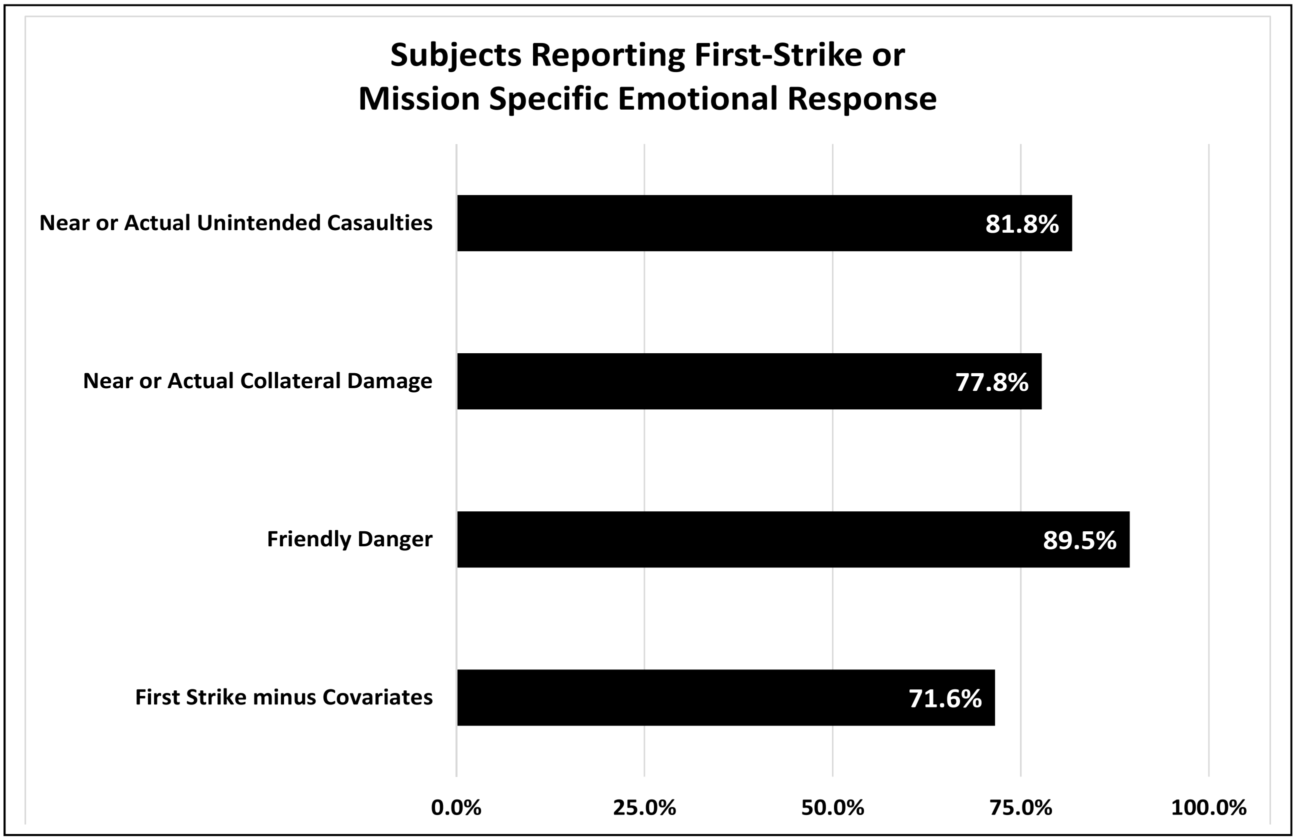


Figure 5.7. Comparison of First-Strike and Mission-specific Emotional-Response Rates

Figure 5.7 demonstrates that subjects who supported friendly forces in danger, or missions that resulted in near or actual collateral damage or unintended casualties, experienced a higher emotional response rate than participants' first strike. Subsequent Chi-square and Fisher Exact Probability Testing revealed no significant differences between any of the mission-specific events and aircrew first-strike response ($\alpha = 0.05$). This, however, was impacted by the small sample sizes available for mission-specific events.[14]

Figure 5.8 below compares the overall first-strike negative emotional response rate from figure 5.4 versus the negative emotional response rate to mission-specific events. Similar to figure 5.7, subjects who supported friendly forces in danger, or missions that resulted in near or actual collateral damage or unintended casualties experienced a higher rate of negative emotional response than participants during their first strike.

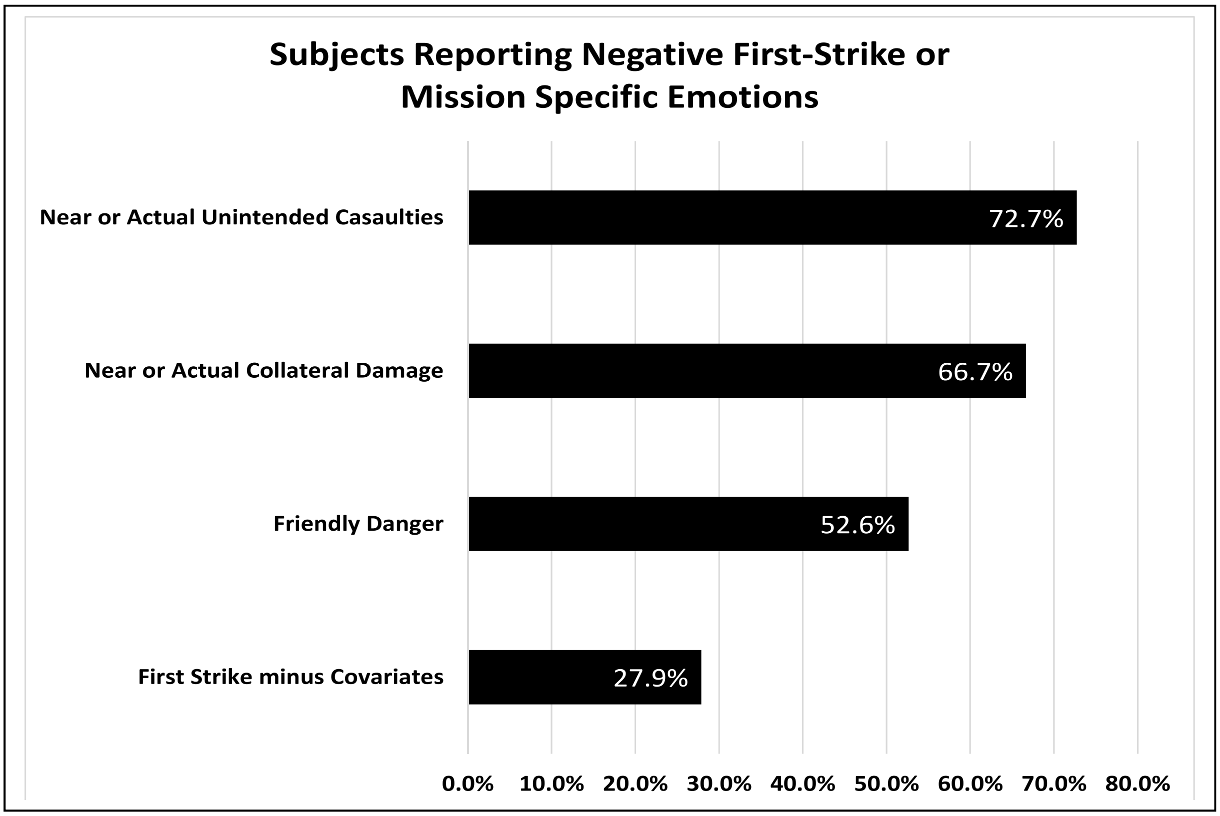


Figure 5.8. Comparison of First-Strike and Mission-specific Negative Emotional Response Rates

[14] The actual number of mission-specific events is not reported for operational considerations.

Subsequent statistical analysis across figure 5.8 was significant between first-strike and all three mission-specific negative emotional responses. Chi-square analysis revealed significant differences between first-strike and friendly-forces-in-danger mission-specific events ($p=0.05$). Fisher Exact Probability Testing was significant between first strike and near or actual collateral damage ($p=0.02$) and between first strike and near or actual unintended casualties ($p<0.01$).

Additionally, a series of odds ratios was performed to assess the relationship between first strike and mission-specific events. Odds-ratio calculations revealed the following:

- Aircrew employing weapons in support of friendly forces in danger were 3.0 times more likely to experience a negative emotional response than those engaged in their first-strike.

- Aircrew employing weapons that resulted in near or actual collateral damage were 4.1 times more likely to experience a negative emotional response than those engaged in their first-strike.

- Aircrew employing weapons that resulted in near or actual unintended casualties were 7.2 times more likely to experience a negative emotional response than those engaged in their first-strike.

Figure 5.9 below compares the overall first-strike disruptive emotional response rate from figure 5.5 versus the disruptive emotional response rate to mission-specific events. Overall, mission-specific events yielded a much higher disruptive emotional response than participants' first-strike. However, statistical analysis across figure 5.9 was insignificant and heavily influenced by the relatively small sample size of reported disruptive events.

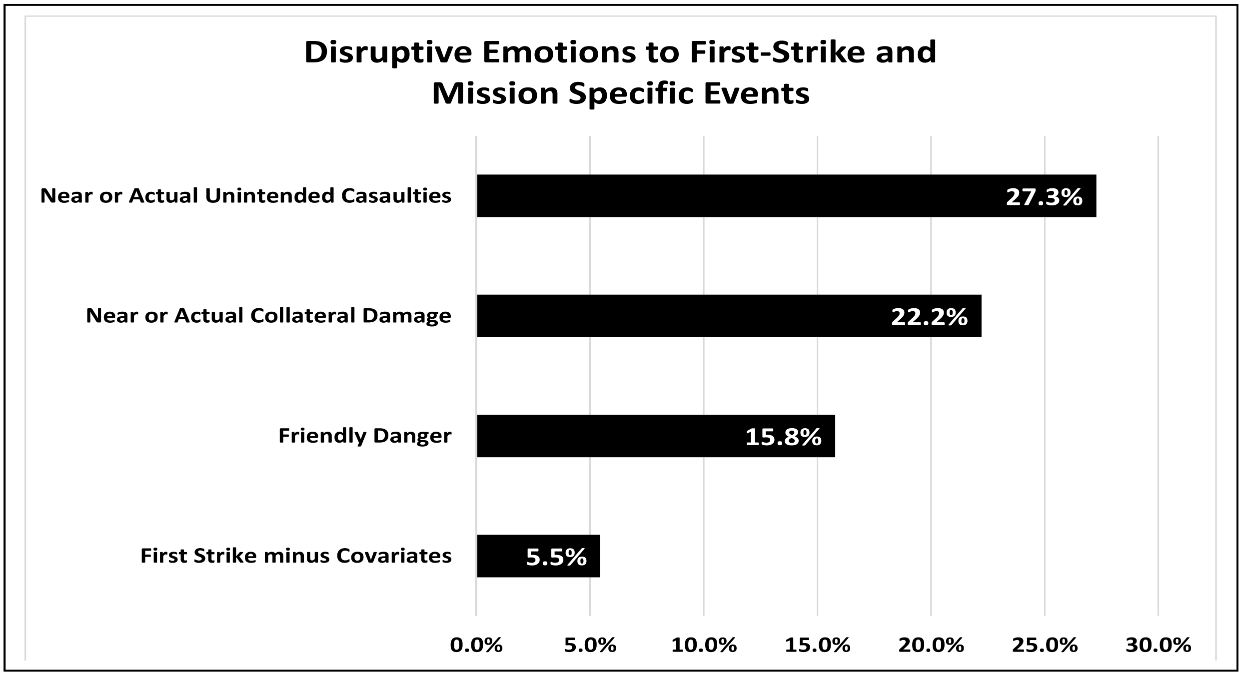


Figure 5.9. Comparison of First-Strike and Mission-specific Disruptive-Emotion Response Rates

Figure 5.10 below compares the overall first-strike unresolved emotional response rate from figure 5.6 to unresolved emotional responses to mission-specific events. Overall, mission-specific events yielded a higher unresolved emotional-response rate than participants' first-strike. However, statistical analysis across figure 5.10 was insignificant and heavily influenced by the relatively small sample size of unresolved emotional issues.

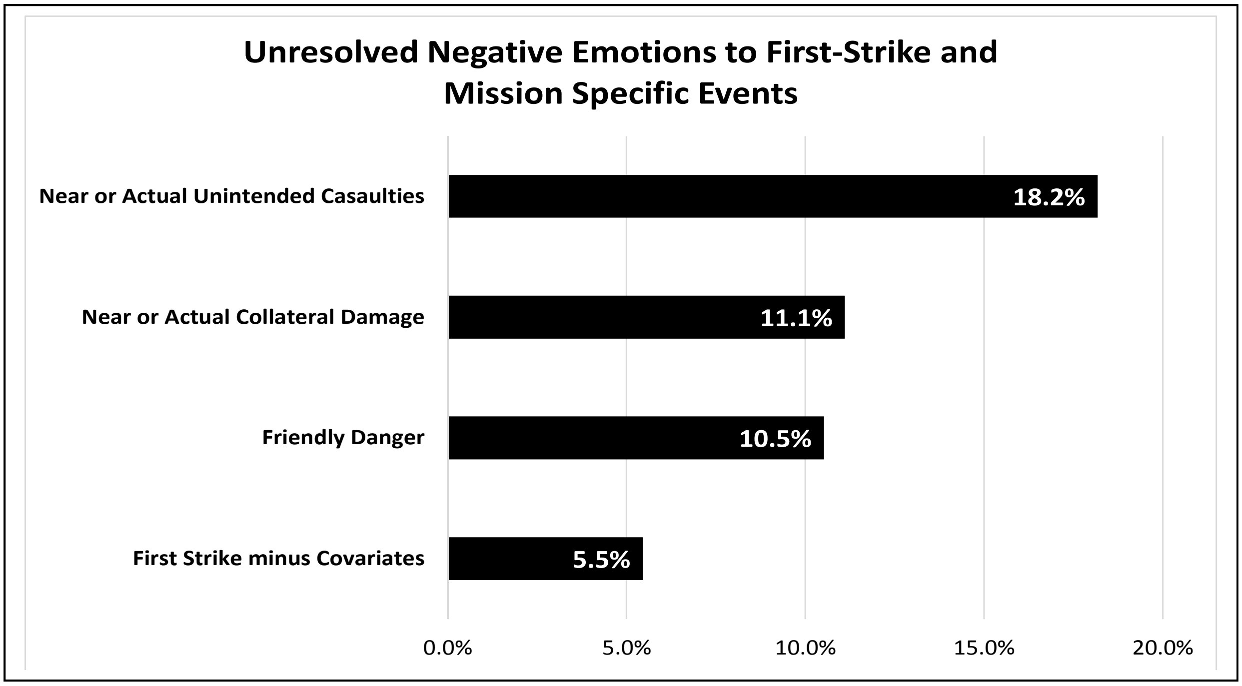


Figure 5.10. Comparison of First-Strike and Mission-specific Unresolved Emotional Response Rates

Target familiarity[15]

Interview subjects were queried on their target familiarity for all strikes during the interview process, with a follow-up question on whether they developed any personal or intimate connections with their targets, especially ones that were tracked for an extended period of time. While several interview subjects stated they had tracked targets for an extended period of time, all interview subjects denied developing any personal connections with targeted individuals. Furthermore, no interview subject recalled having any specific

[15] Due to operational considerations, we cannot report how many targets were tracked for an extended period of time or the length of time subjects tracked them. The data clearly supports a conclusion that RPA aircrew did not develop personal or intimate connections to their targets regardless of tracking time, but the *extent* to which RPA aircrew tracked their targets and still denied any personal connection cannot be detailed due to operational considerations.

emotional, social, or cognitive responses to striking targets that were tracked for an extended period of time.

High Definition Video[16]

Several interview resp5ondents reported at least one weapon engagement using high-definition (HD) video. However, none of these subjects reported having a different emotional, cognitive, or social response due to performing a weapon engagement in the higher clarity video. Common responses to the questions regarding high-definition strikes included:

- "The imagery is intense, but it didn't affect me"
- "The gore was more in HD, but it didn't bother me"
- "I was already desensitized by seeing pictures sent back from our [friendly] ground team from previous missions."
- "You can see more detail, but I didn't think it was overly gory"

Psychological Preparation

Considering that 74 percent of RPA aircrew experienced an emotional response to their first kill and over 44 percent of their emotional responses were negative, an important question arises regarding an individual aircrew's preparation for the act of killing: Do RPA aircrew feel psychologically prepared for their first kill? This project addressed the topic by asking exactly that.

Figure 5.11 below depicts the percentage of RPA aircrew who stated they felt psychologically prepared for their first weapons engagement. Overall, 75

[16] Due to operational considerations, we cannot report how many aircrew employed weapons using high definition video.

percent of the study population stated they felt psychologically prepared. Pipeline aircrew reported the lowest rate of psychological preparation (n=23 / 67.6 percent), while sensor operators reported the highest rate of psychological preparation (n=40 / 80 percent). However, Chi-square and Fisher Exact Probability Tests revealed no significant statistical differences between any of the aircrew-background independent variables in figure 5.11 ($\alpha = 0.05$).

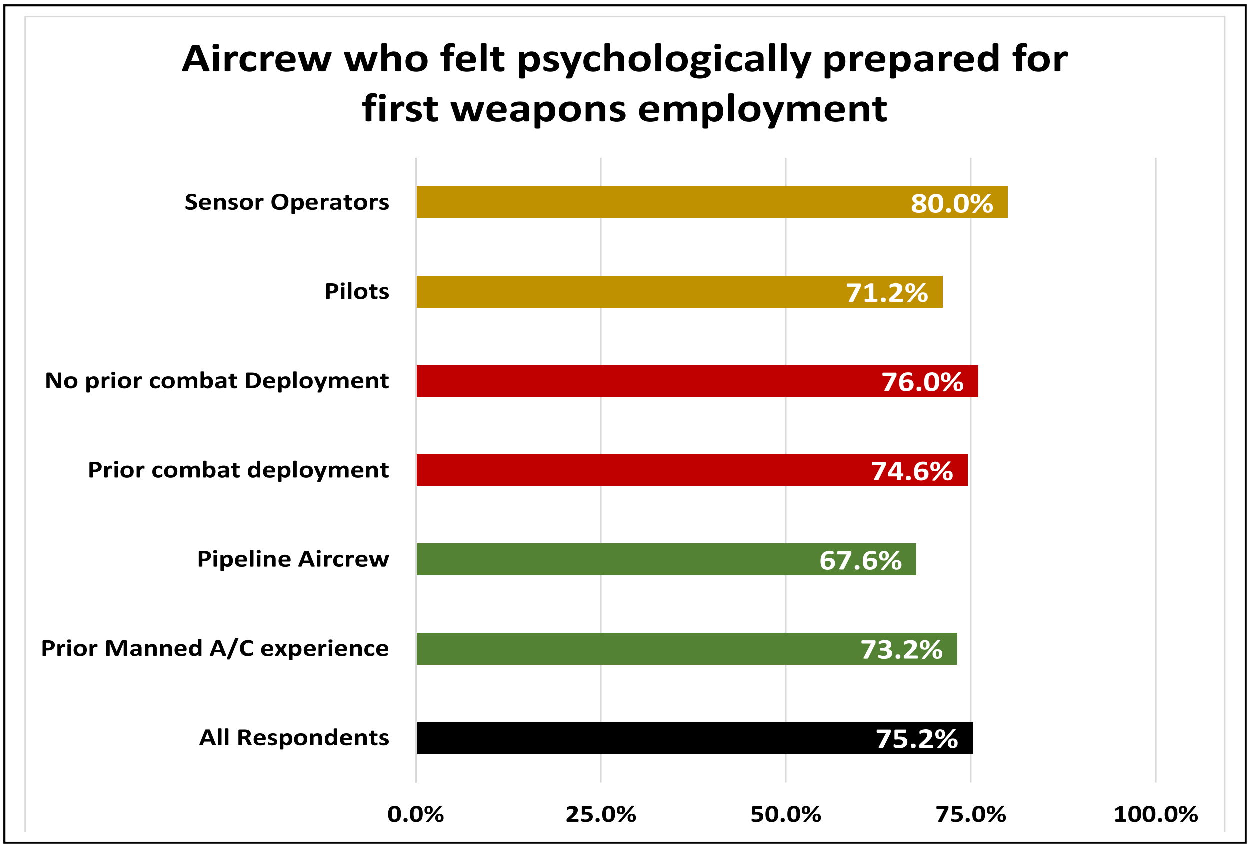


Figure 5.11. Participants feeling psychologically prepared for first-strike

Feelings of psychological preparation, or lack thereof, also displayed a wide variance in the fighter/bomber and mobility/reconnaissance demographics. 90 percent of prior fighter/bomber aircrew stated they felt psychologically prepared for their first engagement, the highest of any demographic in the study. Conversely, only 65 percent of prior mobility/reconnaissance pilots stated they felt psychologically prepared, the lowest of any demographic in the study. Prior mobility/reconnaissance pilots, despite their manned-aircraft experience and extensive combat deployments, reported less psychological preparation for killing than even the Pipeline demographic.

While figure 5.11 demonstrates that three-quarters of the overall RPA study population felt psychologically prepared for their first weapons engagement, the actual interview responses were instructional in understanding why a subject did or did not feel psychologically prepared to employ weapons.

- "You can't prepare for that first engagement."
- "Yes, I was ready. We had a lot of dudes telling us war stories and getting us ready."
- "You can be tactically prepared but nothing will prep you to say KIA [killed in action]."
- "You can't be prepared to know that someone isn't walking the earth anymore due to your actions."
- "Yes…I had two years of 'almost shooting' to prep me. Had I done it earlier, I would have been a mess."
- "I felt ready. But never know until you do it."
- "A couple 'almost strikes' before my first got me ready."
- "I was ready…I thought a lot about it beforehand."
- "Nothing can prepare you. You don't know how you will react until you are in that situation."
- "I saw other people shoot. That got me ready"

- "You can watch all the tape [strike video] in the world but it won't make you ready."
- "You never know till you do it."
- "I felt psychologically prepared, but my previous combat deployment [before I joined RPAs] did nothing to prepare me for killing."

The interview responses regarding psychological preparedness indicate greatly varied reasons for feeling ready or psychologically unprepared for a first strike. On the 'prepared' side, many personnel stated that other aircrew or supervisors helped them prepare, while others claimed they had personally prepared themselves or had 'gotten close to striking' a few times which helped them to psychologically prepare for the first actual engagement. Conversely, the psychologically unprepared group was more homogeneous in its explanations, with most of the interview responses presenting a general feeling of 'never knowing until you do it.' Based upon the interview responses, leadership from front-line supervisors through the squadron commander level appeared to significantly impact a person's mental preparation for remote-warfare. This observation was repeated in the interview commentary for post-strike actions and events where several subjects stated they had a senior enlisted or officer supervisor seek them out and provide impromptu support or counseling after a weapons engagement. Front-line leaders' involvement with their personnel may be a key factor in helping younger aircrew rationalize their killing and minimizing negative psychological responses.

Comparing figure 5.11 to figure 5.4 reveals several correlations between aircrew psychological readiness and first-strike negative-emotional-response rate. Pilots with mobility or reconnaissance-aircraft background and Pipeline aircrew reported feeling the least psychologically prepared for their first-strike and thereafter reported the two highest rates for negative emotional response. Conversely, aircrew with fighter or bomber-aircraft experience reported the highest rates of feeling psychologically prepared and thereafter experienced the lowest first-strike negative emotional rate.

Discussion

As Grossman instructs in *On Killing*, the experience of taking another human life can be an extremely emotional experience that results in reverberations of guilt, sadness, and remorse. While Grossman claims that the increasing distance between attacker and victim in aerial combat greatly reduces the psychological response, statistics in this study demonstrate the commonality of RPA aircrew experiencing strong emotional reactions to their work. Additionally, Navy chaplain Tom Webber's story in chapter 3 recalling his soldiers desire to know, "If God will still appreciate me if I have to pull the trigger on another human being," is ironically similar to an RPA aircrew relaying his experience following the first kill, stating, "[After my first kill] I broke down and went to see the Chaplain…I wanted to know if God was OK with what I was doing."

Neta Bar and Eyal Ben-Ari's interview research for their article "Israeli snipers in the Al-Aqsa intifada" also displays an interesting parallel regarding dreams. In their work, Bar and Ben-Ari quote Israeli snipers who suffer from nightmares following a kill, stating, "After that you have those that have nightmares about it, they dream about it at night."[17] Bar and Ben-Ari labeled these events the 'little traumas.'[18] Although participants were not queried on

[17] N. Bar and E. Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," *Third World Quarterly* 26, No. 1 (2005):138.
[18] Ibid, 137.

recurring dreams regarding their kills for this project, one subject specifically mentioned dreams as an example of resultant emotional response, stating, "After my first shot, I started dreaming about choking someone to death. I've never had those dreams before. I think it was my way of thinking through my actions."

Demographic Impacts

Review of the preceding data on emotional response to killing illuminates several trends for discussion and future comparison across the social and cognitive domains. Pipeline aircrew displayed the second-highest rate of overall first-strike emotional response, the second-highest rate of first-strike negative emotional response, the highest rate of long-duration negative emotional response, the highest rate of disruptive emotional response, and the highest rate of unresolved first-strike negative emotion. While only the disruptive emotional response proved statistically significant, the statistics were heavily influenced by the relatively small sample size of the sub-populations chosen for analysis. Regardless, the Pipeline demographic provided clear trend data regarding a stronger emotional response, and decidedly negative, than any other *Man* independent variable chosen for analysis. Results across the cognitive and social domain will prove extremely useful to support or alter the developing conclusions regarding the Pipeline demographic in the *Man* independent variable.

Sensor operators also trended higher than pilots in reporting negative emotions despite the lack of statistical significance in the comparisons. Sensor operators reported long duration negative emotions at approximately twice the rate of pilots. They also reported disruptive and unresolved negative emotions at three times the rates of MQ-1/9 pilots.

Additionally, pilots with prior mobility/reconnaissance aircraft experience displayed the highest overall first-strike emotional response, the highest rate of negative first-strike emotional response, and the highest rate of short-duration first-strike emotional response. Similar to the Pipeline group comparisons, the mobility/reconnaissance group comparisons lacked statistical significance, but were heavily influenced by the small sample size of mobility/reconnaissance and fighter/bomber pilots. At first glance, the relatively high emotional-response rate across a demographic that has both manned-aircraft and combat-deployment experience is challenging to explain. Theories and conclusions will be withheld on this topic until a more detailed picture can be developed using the social- and cognitive-domain results.

Conversely, the prior fighter/bomber demographic reported the lowest rate of negative emotional response, the lowest rate of disruptive emotional response, and the lowest rate of unresolved emotions across the entire study. Based upon the theory presentation in chapter 3, these results are somewhat expected given that the fighter/bomber demographic contains manned-aircraft experience, combat-deployment experience, and previous weapons-employment experience (including killing) before joining the RPA community. While trending as predicted, final judgment on this demographic will be withheld until the presentation of statistics across the social and cognitive domains.

Aircrew Conflicted

The presence of differing emotions across the same and subsequent weapons engagements by a single interview subject presents complicating factors for analysis. However, it also provides a hidden gem while trying to ascertain the level of 'reality' experienced by individual RPA aircrew engaged in combat operations.

First, vast differences in emotional responses across different strikes by the same individual raises a question regarding the statistical potency of first-strike emotional responses versus subsequent weapon engagements. This project originally hypothesized that first-strike emotional responses would be the strongest and most worthwhile for analysis. However, once it became clear that *any* weapon engagement could result in a significant emotional response for the subject, the interview focus shifted to include both first-strike and mission-specific events for collection and statistical analysis. While the mission-specific analysis controlled for first-strike covariates, there could undoubtedly exist mission-specific events that present additional confounding variables. Weapons employments that resulted in significant mission success, employments that were missed due to human or machine error, and employments that were successful despite highly demanding circumstances are just three additional variables that may have impacted an aircrew's resulting emotions. First-strike experiences undoubtedly influenced the emotional and overall psychological response of individual RPA aircrew as well, but we cannot state with certainty the relative standing of first-strike events as compared to many other variables that can occur while employing weapons in combat.

Second, the silver-lining in identifying possible confounding variables to emotional response is a deeper realization that individual RPA aircrew can, and do, experience vastly different emotions across the same and subsequent strikes. Eleven of the twenty-nine aircrew who reported no emotional response to their first strike took extra time during the interview to identify emotional responses to subsequent strikes. Had the interviews been structured to measure the emotional response to every single strike by every aircrew interviewed, there would have undoubtedly been additional aircrew who reported an emotional response to subsequent events.[19] These fluctuating emotions of the aircrew involved in killing via RPA provide key evidence that robot-like operators void of emotion or understanding of their work does not accurately portray RPA aircrew involved in remote killing.

[19] As discussed in chapter four, aircrew were not queried on their emotional, social, and cognitive responses for every event in order to keep interview lengths to an hour or less.

Target Familiarity and High Definition Video

Somewhat surprisingly, increased target familiarity and weapons employment through high-definition video did not impact the psychological response of RPA aircrew interviewed for this study. While these two *Mission* and *Machine* independent variables will be retained for further comment and analysis at the end of this project, they will not be presented in the cognitive and social-domain sections.

Psychological Preparation for Killing

The correlation between aircrew psychological readiness and first-strike negative-emotional response raises an interesting question for consideration: 'How can the psychological preparedness of RPA aircrew, and specifically Pipeline Aircrew, be increased?' This question is a valid one to ask, but in searching for an answer, we must proceed with utmost caution. While this study sought to outline the rates of cognitive, emotional, and social responses across the MQ-1 and MQ-9 aircrew community, it did so with knowledge the overall USAF aircrew community lacks a published standard for psychological preparation or resultant psychological response rates due to killing in combat. The RPA Pipeline demographic, and to a lesser extent prior mobility/reconnaissance aircrew, undoubtedly stand out when juxtaposed against other RPA demographic groups, but the RPA community, along with the rest of the USAF, lacks an accepted standard to determine if its psychological preparedness and resulting emotional response falls within acceptable norms. The relative outlier status of the Pipeline and mobility/reconnaissance demographics could simply be an aberration of a larger RPA demographic that already falls well within, above, or below societal norms for psychological response to killing in warfare.

Furthermore, while efforts to address any lack of psychological preparedness within the Pipeline group would be a laudable goal, one should raise a concerned brow to any efforts at reducing the negative or disruptive emotional response across the MQ-1/9 community without a widely accepted medical standard to use as a baseline. Negative and disruptive emotional responses present an issue that often requires operational-commander and medical-community action, but they also demonstrate a palpable mental connection between the virtual-reality world of an RPA aircrew and their impact on the physical world. As discussed previously, commanders and front-line supervisors appear to play a key role in supporting their personnel and assisting in their rationalization of remote killing, but leadership's goal should not be to completely eliminate the mental reaction to killing. Instead, supervisors should be attempting to psychologically prepare their personnel for remote killing and providing support after the event.

In order to better demonstrate this point, let us approach this matter from a separate direction. Had this project measured a zero percent negative or disruptive emotional response rate across the MQ-1/9 aircrew community, we should be highly concerned that USAF RPA aviators are completely disengaged from the reality of their jobs and the deadly business they support. The fact that RPA aviators displayed an overall 31 percent negative emotional response rate to their first strike and Pipeline aviators displayed a 37 percent rate should be a *moderately* comforting piece of data to operational commanders. The word 'moderately' is emphasized precisely because without a gold-standard from which to measure, we cannot be certain if the RPA aircrew, and Pipeline aviators specifically, are demonstrating too much or too little emotional response to killing. We can only state for certain that some RPA aircrew are experiencing a negative emotional reaction to killing with feelings of remorse, guilt, or sadness, clearly indicating they are emotionally impacted by their work.

Searching historical records for a societal standard, or useful comparison, to the RPA statistics in figures 5.2 through 5.6 also proves problematic. For example, during World War II, Eighth Air Force removed aircrew from flight duties at a rate of 42.7 per 1,000 (4.2 percent) due to emotional distress.[20] While World War II aircrew did suffer emotional tension due to the thought of killing others with some completely unable to tolerate the guilt of killing, a full statistical description of those who were removed from flight duties *specifically* due to their psychological reactions to killing is not

[20] Mark Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (New York, NY: Routledge, 1995), 70.

readily available for comparison.[21] Moreover, even if this data were available, it would be extremely difficult to conduct covariate analysis on the psychological responses to killing versus the more common causes of fear and fatigue that resulted in the grounding of many World War II aircrew. RPA aircrew, by virtue of their completely different risk profile during combat operations, present a challenging case for statistical comparison to all other forms of traditional combat. Possible confounding variables in the comparison include fear of death or injury and exposure to harsh conditions for extended periods of time during traditional combat operations.

Furthermore, studies such as the one quoted above for World War II aircrew were focused on aircrew removed from flight duties, either temporarily or permanently, due to neuropsychiatric issues. This RPA study demanded no such threshold and instead sought to simply understand *whether* RPA aircrew experience an emotional, social, or cognitive response to killing. During the course of the research, aircrew were interviewed who had been removed from flight duties both voluntarily and involuntarily following their psychological responses to killing, but these cases are not separated from the larger population of those emotionally impacted by killing and subjected to further analysis.[22]

---

[21] Roy R. Grinker and John P. Spiegel, *Men under Stress* (Philadelphia, PA: Blakiston, 1945), 35; Mark Kendall Wells, "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992, 193.

[22] The main reason these aircrew were not further categorized was the lack of clinical diagnostic capability during the interview process. The interviewer was able to note social, emotional, and cognitive responses in RPA aircrew but is not a trained psychologist and thus is

The National Vietnam Veterans Readjustment Study (NVVRS), published in 1988 by Kulka et al. provides another opportunity for psychological comparison with RPA aircrew. NVVRS is the most rigorous and comprehensive study of the prevalence of post-traumatic stress disorder (PTSD) and other psychological problems in readjusting to civilian life among Vietnam veterans.[23] Consisting of 3,016 participants and a 3,000 page final report, NVVRS found 30.6 percent of all male Vietnam veterans had PTSD at some point in their lives.[24] Within NVVRS, the prevalence of PTSD was characterized as a function of war-zone-stress exposure.[25] However, this kind of mental trauma was defined as a dimensional measure of the degree of exposure to circumstances and events in Vietnam that were dangerous, threatening, and/or unpleasant, resulting in a definition much too broad to be useful in comparison to a dedicated study focused solely on the psychological aspects of killing.[26] NVVRS also measured PTSD as function of Direct Combat Involvement (DCI), but the definition of DCI was overly broad and included viewing the death or injury to others, to be useful as a comparative statistic to the RPA study.[27]

---

unqualified to provide a clinical diagnosis to the subject aircrew at the time of interview. Some aircrew, however, did state during the interview process that they had been seen by medical professionals and diagnosed accordingly after they experienced strong psychological reactions to killing. Furthermore, previous studies on RPA aircrew discussed in chapter three have already investigated the prevalence of PTSD and occupational burnout in RPA aircrew. This study did not seek to duplicate those efforts.

23 R. Kulka, W. Schlenger,, J. Fairbank, R. Hough, B. Jordan, C. Marmar, D. Weiss. *Contractual Report of Findings from the National Vietnam Veterans Readjustment Study*, November 7, 1988, Volume I, 1.

24 Ibid, 2.

25 Ibid, IV-2-1.

26 Ibid, III-7.

27 Ibid, C-6.

Finally, one possible contemporary comparison to RPA operations can be found in a 2010 article in the *Journal of Traumatic Stress* by Maguen et al. titled, "The Impact of Reported Direct and Indirect Killing on Mental Health Symptoms in Iraq War Veterans." Maguen et al. specifically investigated the psychological effects of killing in 2,797 American soldiers returning from Iraq in 2005-2006, taking pains to control for combat exposure.[28] Maguen concluded that taking a life in combat was, "A potent ingredient in the development of mental health difficulties."[29] However, the Maguen et al. study contains two characteristics which inhibit direct comparison to the RPA community. First, Maguen et al. included both direct and indirect killing in their study, while this RPA study includes only those actually pulling the trigger. Second, the Maguen et al. study focused specifically on mental health difficulties instead of a more generalized approach to cognitive, social, and emotional responses to killing. In this manner, comparisons to the Maguen et al. study suffer from the same issues as described above for studies involving World War II aircrew.

Mission-specific Responses

MQ-1/9 aircrew clearly demonstrated significant emotional response to missions where they perceived friendly ground forces to be in grave danger or where their strikes resulted in near or actual collateral damage or unintended

[28] S. Maguen, B. Lucenko, M. Reger, G. Gahm, B. Litz, K. Seal, S. Knight, and C. Marmar. "The Impact of Reported Direct and Indirect Killing on Mental Health Symptoms in Iraq War Veterans," *Journal of Traumatic Stress* 23, No. 1 (February 2010): 89.
[29] Ibid.

casualties. Emotional response rates to mission-specific events were higher across every category when measured against first-strike responses. Based upon these statistics, we can conclude that mission-specific events play a significant role in determining the psychological response among individual RPA aircrew. Moreover, the high rate of emotional response for friendly forces in danger clearly indicates that RPA aircrew are not only impacted by their own actions in combat, but that they have developed a mental connection with the friendly forces they support despite the extreme physical distance separating them. In fact, friendly forces in danger resulted in the highest emotional response rate across the entire study (89.5 percent), surpassing all other independent variables identified for analysis.

Conclusion

Overall, the independent variables related to *Man*, *Machine*, and *Mission* provided widely varied emotional responses across the MQ-1/9 aircrew. *Man* independent variables clearly had a large influence on the rates of emotional response in the negative categories as Pipeline, sensor operators, aircrew lacking a prior combat deployment, and pilots with prior mobility/reconnaissance experience all reported higher response rates compared to their corresponding groups. *Machine* related variables, conversely, had no impact on the level of emotional response as all interview subjects denied any changes in their emotional response to killing while using high-definition video. Emotional responses due to *Mission* independent variables were mixed, as target familiarity resulted in no emotional response changes across any sub-category of RPA aircrew. However, friendly forces in danger, near or actual collateral damage, and near or actual unintended casualties resulted in the highest rates of emotional response for RPA aircrew throughout the entire study.

Thus far, these statistics suggest MQ-1/9 aircrew possess an emotional connection to the results of their work and the ground forces they support. The next step is to present the social and cognitive domains using the same methodology and thereafter develop a more comprehensive picture of the psychological response to killing among RPA aircrew.

Chapter 6

Social Domain and Video-Gaming Results

Introduction

In the ensuing chapter, social-domain responses to killing via RPA are quantified across *Man* and *Mission* independent variables regarding aircrew background and mission-specific events. *Machine* independent variables were not found to have a significant impact on psychological responses across the social domain and will not be discussed further in this section. Where appropriate, interview subjects are quoted directly to provide additional detail and insight regarding their psychological response.

Primary comparisons are made using the following *Man* independent variables:

1. Pipeline aircrew *versus* Aircrew with prior manned aircraft experience
2. Aircrew with no prior combat deployment *versus* Aircrew with prior combat deployment
3. RPA pilots *versus* RPA sensor operators

Additionally, secondary comparisons across *Man* independent variables are used to examine differences between RPA pilots with fighter or bomber-aircraft experience and RPA pilots possessing prior mobility or reconnaissance-aircraft background.

Finally, RPA aircrew video-gaming data is provided within this section. Although video-game play is not a social-domain response per se, the inclusion of video-gaming data provides relevant social background data for discussing the technological aspects of modern RPA warfare and allows for substantiation or refutation of video-game theories regarding RPA aircrew.

Social Domain Results

First-strike social responses were categorized according to the tree diagram presented in chapter four. An updated tree diagram with accompanying data is presented in Figure 6.1 below. Notable features of Figure 6.1 include:

1) On the first branch of the tree diagram, participants were restricted to a polar 'yes' or 'no' response regarding whether they experienced any social response. In subsequent levels of the tree diagram, participants were permitted to report multiple conditions (positive & negative, short & long, etc.).

2) Regardless of level on the tree diagram, percentages reported for each condition are measured against the overall study population of 111 participants.

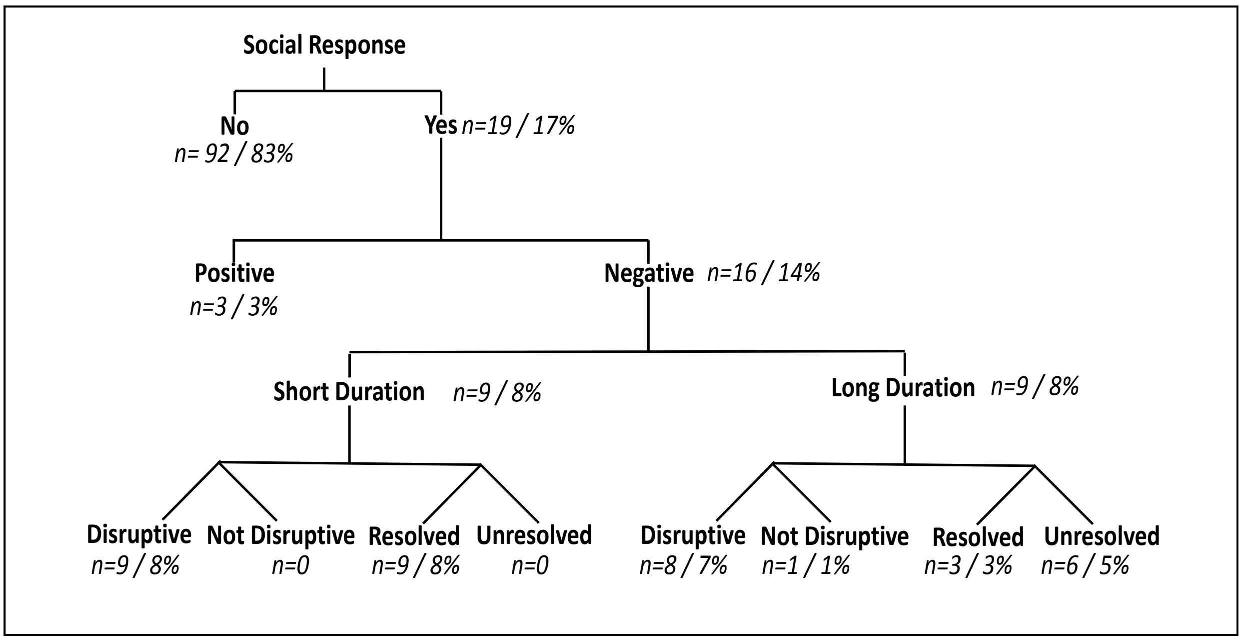


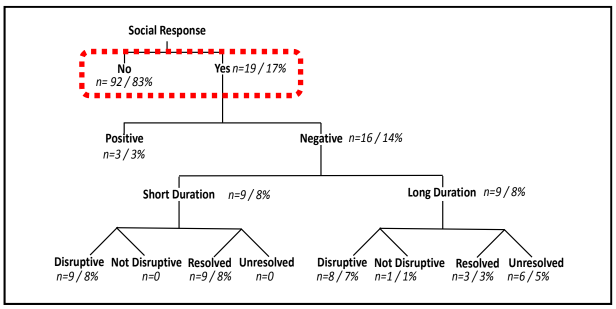
Figure 6.1. First-Strike Social Response Tree Diagram

Subject descriptions of their social responses included the following:

- Positive: social bonding with other aircrew, approaching social situations in a more positive and/or calm manner

- Negative: distancing of oneself from family, friends, or co-workers, negative attitude towards family & friends, approaching social situations in a more negative manner

Any Social Response to First-Strike



Nineteen interview subjects (17 percent) reported a social response to their first kill. Figure 6.2 below depicts these responses categorized across *Man* independent variables. Sensor operators reported the highest rate of strikes with a social response (n=12 / 23.5 percent) while pilots reported the lowest rate of first strikes with a social response (n=7 / 11.7 percent). However, Chi-square and Fisher Exact Probability Tests revealed no significance between any of the aircrew-background independent variables in figure 6.2 ($\alpha = 0.05$).

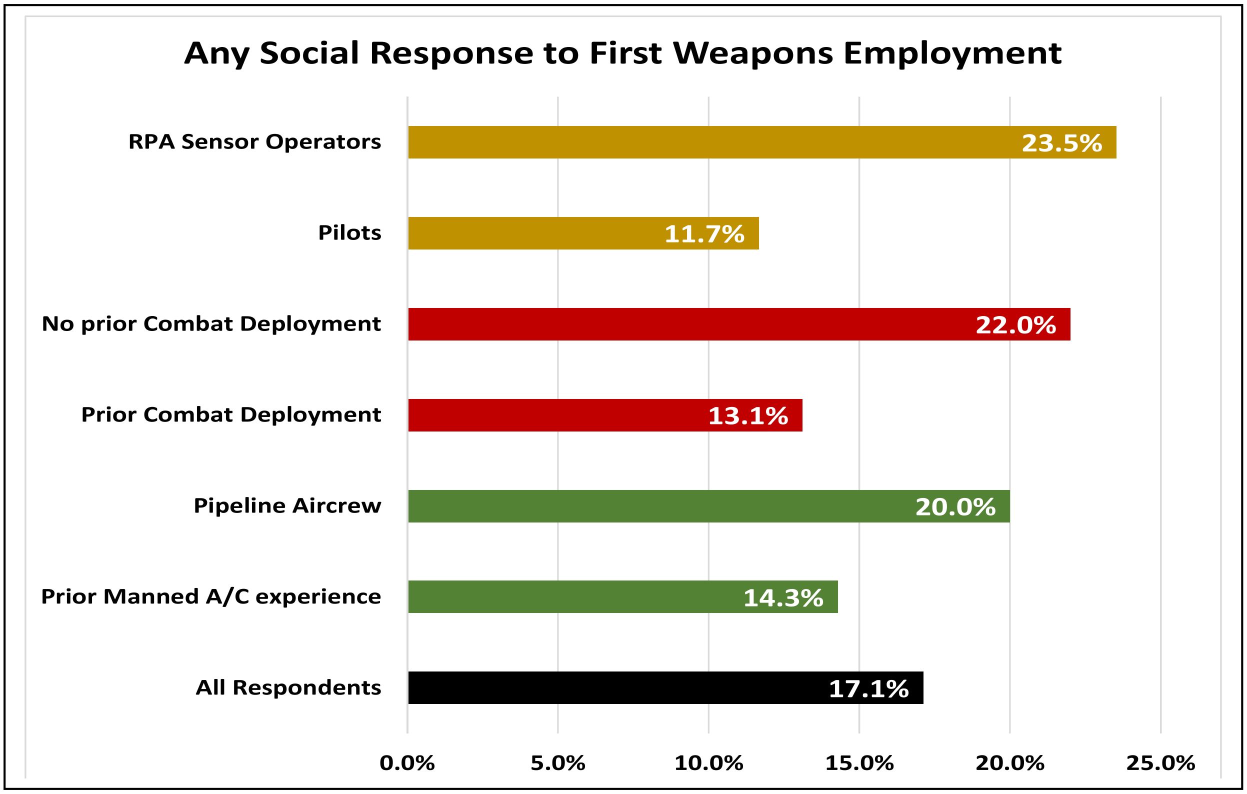
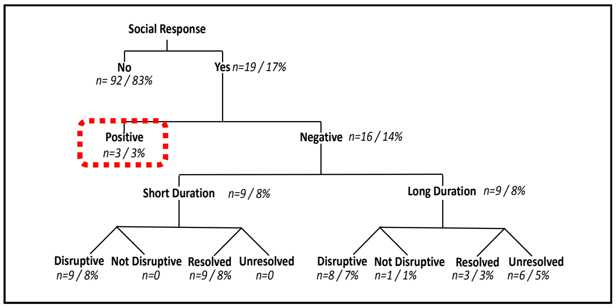


Figure 6.2. First-Strike Social Response Rate

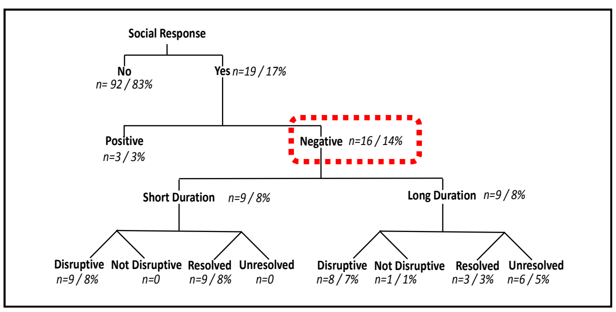
Secondary analysis of the *Man* independent variables revealed prior mobility/reconnaissance pilots reporting the fourth-highest social response rate for first strikes and prior fighter/bomber pilots reporting no social responses in any category. Chi-square and Fisher Exact Probability testing of mobility/reconnaissance versus fighter/bomber pilots was insignificant, but heavily influenced by the small sample size of fighter/bomber pilots in the study.

Positive First-Strike Social Response



Three interview subjects (3 percent) reported a positive social response to their first strike; two sensor operators and one pilot. Chi-square and Fisher Exact Probability Testing revealed no significance among *Man* independent variables.

Negative First-Strike Social Response



Sixteen interview subjects (14 percent) reported a negative social response to their first kill, approximately one in every seven interview subjects. Figure 6.3 below depicts these responses categorized across *Man* independent variables. Sensor operators reported the highest rate of first-strikes with a negative social response (n=10 / 19.6 percent) while pilots reported the lowest rate (n=6 / 10 percent). However, Chi-square and Fisher Exact Probability

Testing revealed no statistical significance between any of the aircrew background independent variables in figure 6.3.

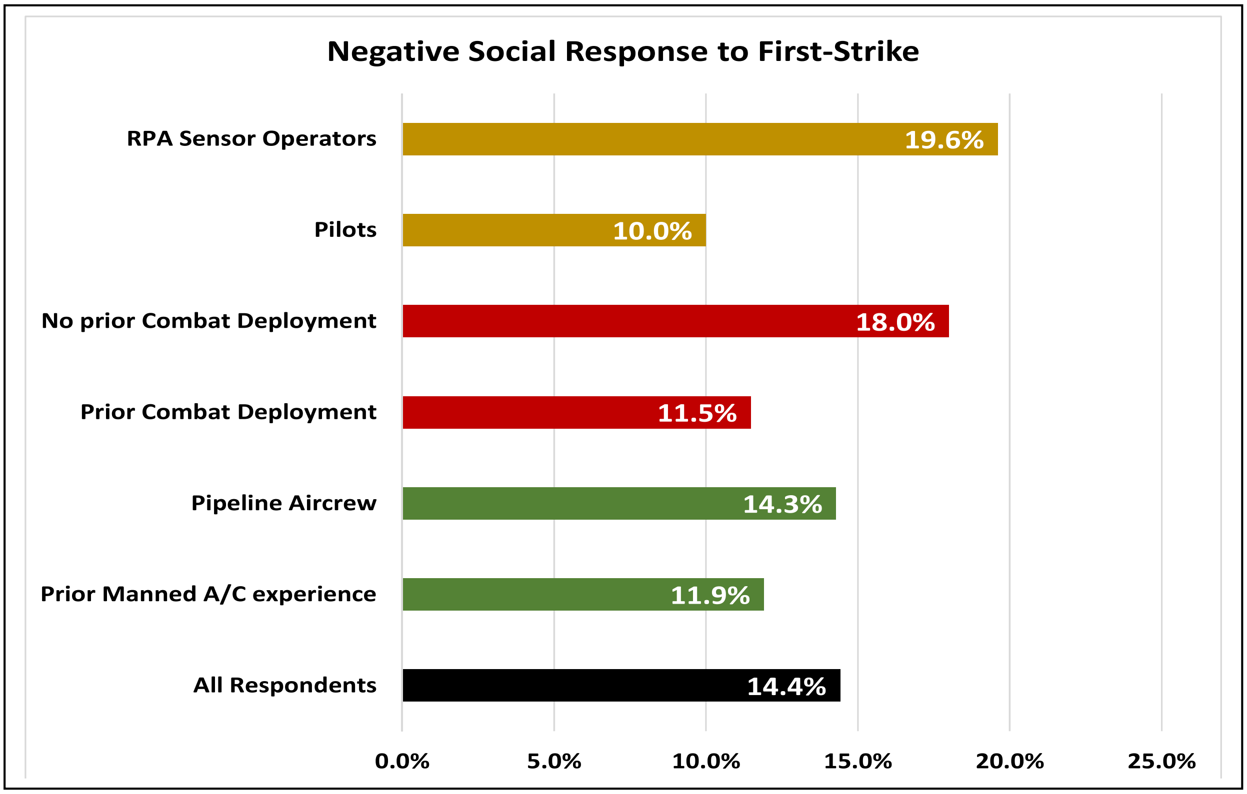
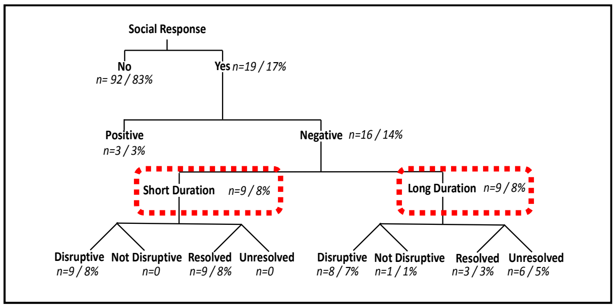


Figure 6.3. First-Strike Negative Social Response Rate

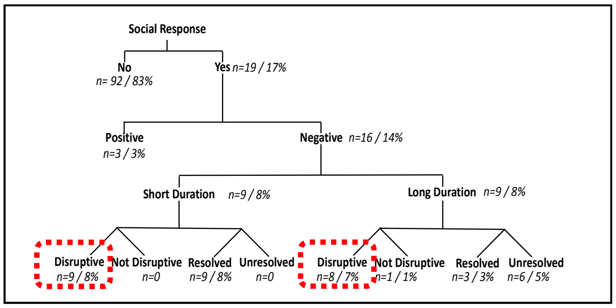
Secondary analysis of the *Man* independent variables reveals prior mobility/reconnaissance pilots as the second highest demographic experiencing a negative first-strike social response (18.5 percent). As previously discussed, no prior fighter/bomber aircrew reported a social response to their first-strike, but Chi-square and Fisher Exact Testing was insignificant between these two demographics.

Short and Long Duration Negative Social Responses



Nine interview subjects (8 percent) reported a negative social response to their first kill lasting less than forty-eight hours. Additionally, nine interview subjects (8 percent) reported a negative emotional response to their first kill lasting longer than forty-eight hours. Across the *Man* independent variables, sensor operators reported the highest rate of short-duration negative emotions (10 percent). Sensor operators and aircrew with no prior combat deployments both reported the highest rate of long-duration negative emotions (10 percent). Chi-square and Fisher Exact Testing revealed no significance in the differences across *Man* independent variables for short or long-duration negative social response. However, Pipeline aircrew and sensor operators reported long-duration negative social responses at approximately twice the rate of their corresponding groups while aircrew lacking a prior combat deployment reported a nearly three-fold increase. Finally, secondary analysis revealed pilots with prior mobility/reconnaissance experience reporting the highest rate of short-duration negative social response (14.8 percent), exceeding all other demographics in the study.

Negative Disruptive First-Strike Social Response



Fifteen interview subjects (13.5 percent) reported a negative social response that resulted in disruptive behaviors to their professional or personal lives.[1] This statistic includes disruptive behaviors resulting from both short and long-duration social responses.[2] Figure 6.4 below depicts these responses categorized across *Man* independent variables, allowing for only a single instance of disruption per subject to remove any double-counters. Sensor operators reported the highest rate of first strikes with a disruptive negative emotional response (n=9 / 17.6 percent) while pilots reported the lowest rate (n=6 / 10 percent). However, Chi-square and Fisher Exact Probability testing was insignificant for *Man* independent variable comparisons. Additionally, secondary analysis revealed pilots with prior mobility/reconnaissance experience reporting the highest disruptive rate of any demographic (18.5 percent).

---

[1] See chapter four for further definition and discussion on disruptive behavior.

[2] The emotional tree diagram shows seventeen total instances of disruptive emotional response in the short and long duration sub-categories. Two individuals reported in both short and long categories, counting twice. Hence, fifteen total persons reported disruptive behaviors of a social nature.

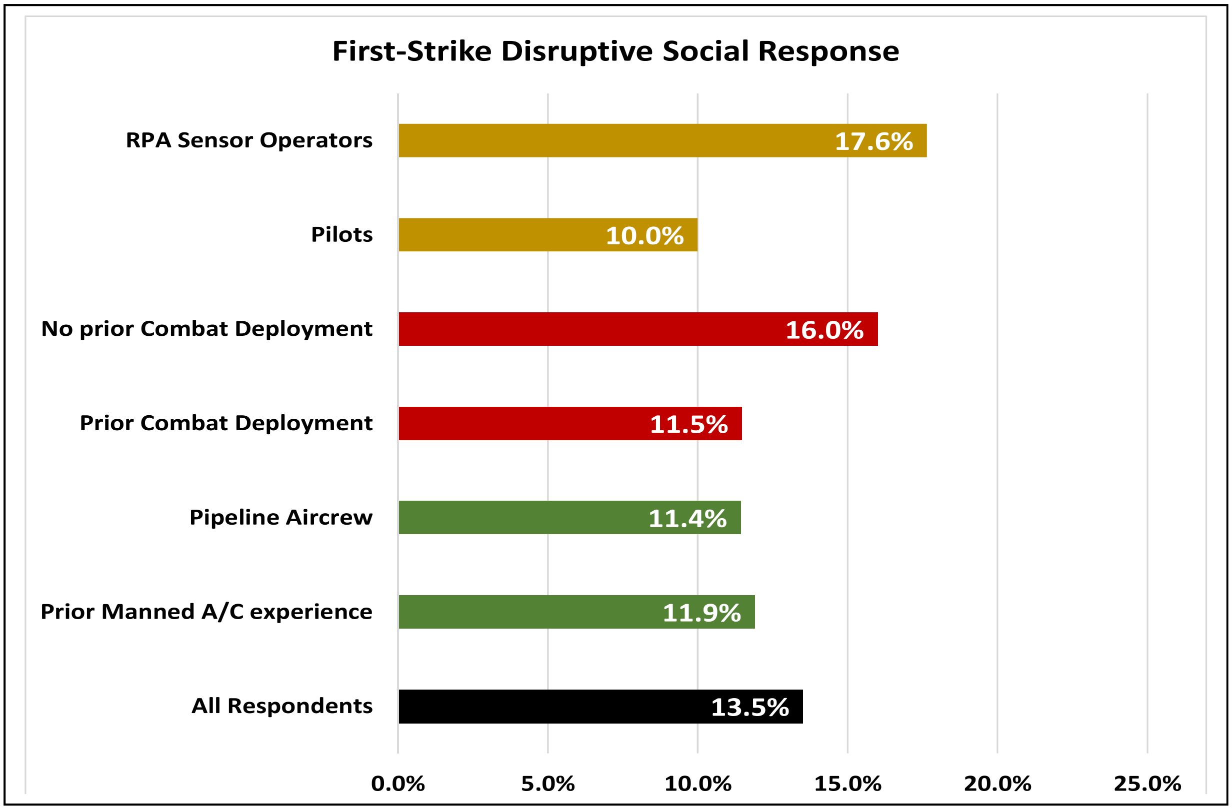
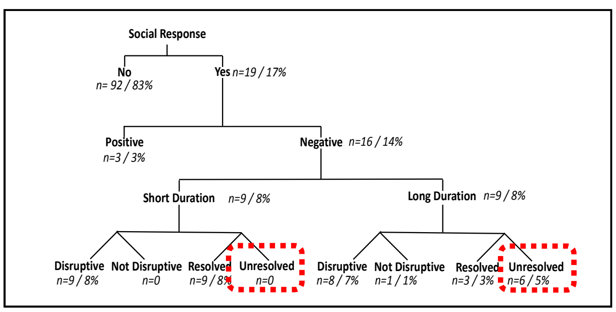


Figure 6.4. First-Strike Disruptive Social Response Rate

Negative Unresolved First-Strike Social Response



Six interview subjects (5 percent) reported an unresolved negative emotional response from their first weapons engagement.[3] All six unresolved negative social responses were reported in the long-duration category. Figure

[3] See Chapter 4 for further definition and discussion on unresolved emotion.

6.5 below depicts these responses categorized across *Man* independent variables. Aircrew with no prior combat deployment reported the highest rate of unresolved negative social response (n=4 / 8 percent). Aircrew with prior manned aircraft experience reported the lowest rate of unresolved social responses (n=1 / 2.4 percent). Chi-square and Fisher Exact Probability Tests revealed no significant statistical differences between any of the *Man* independent variables. However, sensor operators and aircrew without a prior combat deployment reported unresolved negative social responses at over twice the rate of their corresponding groups, continuing their leading trends in the negative category.

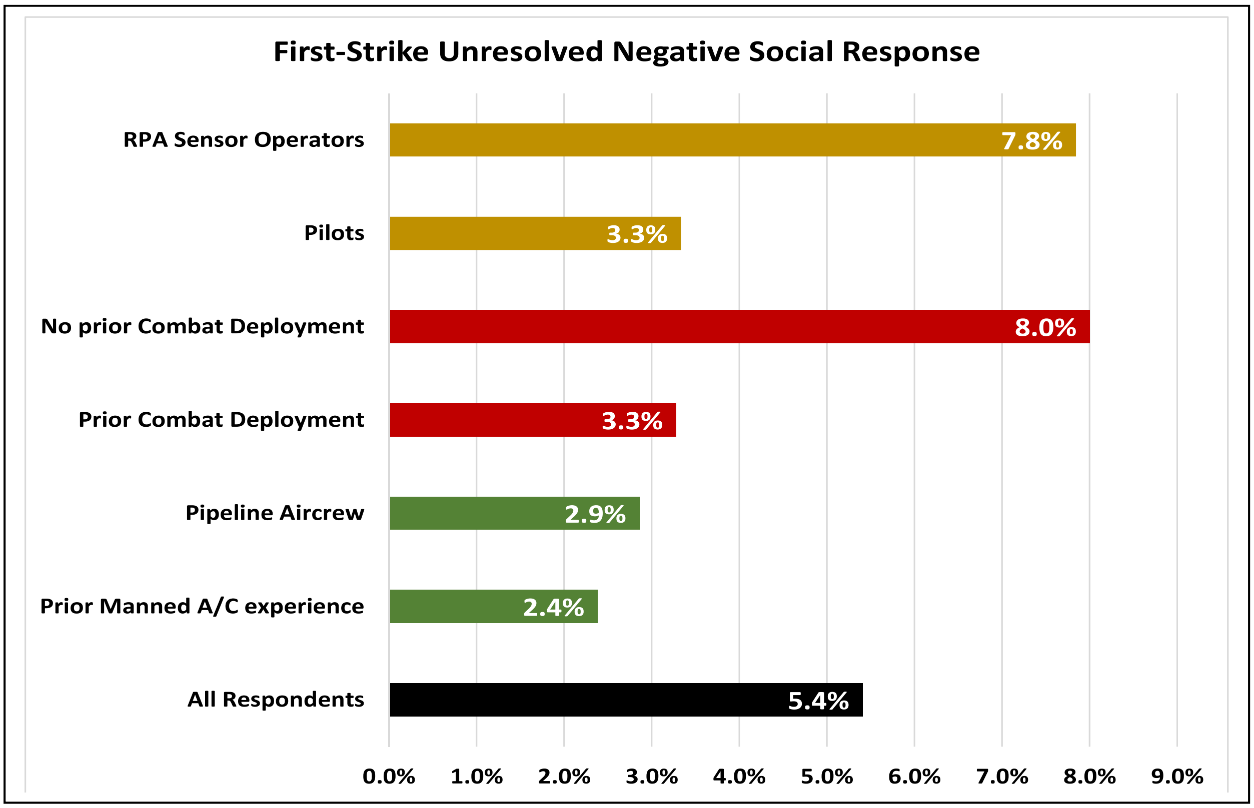


Figure 6.5. First-Strike Negative Unresolved Social Response Rate

Interview Commentary

While figures 6.2 through 6.5 display the statistical results of first-strike social responses, interview responses were insightful and detail-rich regarding the spectrum of social responses experienced by RPA aircrew following their first engagement.

- "My wife knows when I've struck because I'm pretty quiet for a while."
- "After first shot my wife knew I was down."
- "My wife noticed I'm a bit more ill-tempered."
- "I wanted to hang out with my flight members more."
- "I stopped posting on Facebook. I get angry less. My wife saw a difference even though I tried to hide it."
- "I didn't have a social response, but you can't talk about your work, so it makes it tough to go home."
- "I could still hang with my non-military friends, but it was different. Their stories were hollow to me."
- "You get a little bit of a bond with the people you've struck with."
- "My wife noticed I was distant."
- "My wife said, 'You just bring home so much anger sometimes'.
- "Striking impacted my temper. I have a different feeling towards civilians now because they don't appreciate what we do to keep them safe."
- "After I struck, it didn't change me, but it changed my wife. It impacted her to know that I was killing people."

Social Domain Discussion

Demographic Impacts

Review of the preceding data on the social responses to killing via RPA illuminates several trends for discussion and comparison across the emotional, social, and cognitive domains. First, results of the *Man* independent variables continued the trend of less-experienced aircrew and sensor operators reporting higher rates of psychological response in the negative categories. Across the social domain, sensor operators led two categories (total social response and negative social response) and placed second in four others (short and long-duration response, disruptive response, and unresolved response rate). Pilots in general, and prior fighter/bomber pilots specifically, continually reported low rates of social response as compared to other demographics.

Second, social-domain results were undoubtedly impacted by the relatively low rate of overall social response (17 percent). Two explanations emerge as a possible basis for these results; either RPA aircrew are displaying a high level of homogeneity in their psychological responses regardless of *Man* independent variables or the sample sizes with accompanying response rates were insufficiently large to provide significance upon quantitative analysis.

Had the study doubled the sample size and recorded the same response-rate trends, statistically significant outcomes may have been possible in overall social response, negative social response, and disruptive social response categories. This finding indicates that aircrew may be exhibiting some homogenous tendencies in their response rates across some categories, but had the sample sizes been increased, a statistically significant result may have been possible to attain in others.

Moreover, trend data across the entirety of social-domain responses clearly indicates sensor operators and aircrew lacking a prior combat deployment are displaying higher rates of negative social response when compared against their corresponding demographic groups. Aircrew with prior mobility/reconnaissance experience also continue to trend negative across both the social and emotional domains, leading in two social and three emotional categories despite the lack of statistical significance compared to the prior fighter/bomber demographic.

Finally, pilots with prior fighter/bomber experience continued their trend of reporting the lowest rate of negative responses compared to other demographics. Within the emotional domain, fighter/bomber pilots reported the lowest rate of overall emotional response, the lowest negative-response rate, the lowest disruptive rate, and the lowest unresolved-emotion rate. Across the social domain, prior fighter/bomber subjects reported zero social responses across all categories. Although statistically insignificant, the trend regarding prior mobility/reconnaissance subjects leading the negative-response rate in several categories, while prior fighter/bomber pilots report a near-zero response rate across all categories, is informative. Results within the cognitive domain will prove useful in developing conclusions on this trend, especially given the lack of statistical significance thus far between these two demographics.

RPA Aircrew Video-Gaming Results

Table 6.1 below outlines the demographic data of the interview subjects regarding overall video game playing in the past three months.

	n	%
All Respondents	56	50.5%
Prior Manned A/C experience	20	47.6%
Pipeline Aircrew	23	65.7%
Prior Combat Deployment	28	45.9%
No prior Combat Deployment	28	56.0%
Pilots	32	53.3%
RPA Sensor Operators	24	47.1%

Table 6.1. Subjects reporting any video-game play in previous 3 months

Figure 6.6 below depicts the mean hours of video-game playing by RPA aircrew in the previous three months. The entire participant population averaged 2.4 hours of video game playing per week (STD DEV= 4.5 hours). Common video game types reported included role playing, first-person shooter, and strategy games.

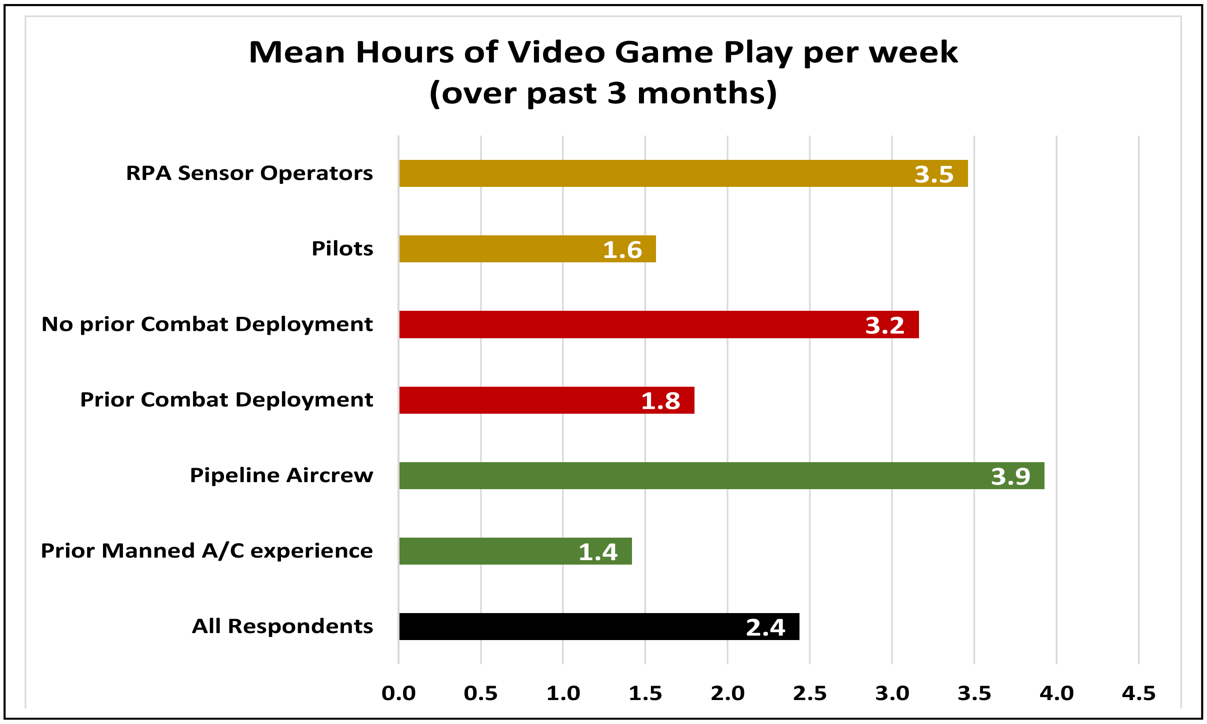


Figure 6.6. Mean Hours of Video-Game Playing per week

Video-gaming frequency across *Man* independent variables closely emulates average age across aircrew demographics. The oldest demographic (prior manned-aircraft experience) played the lowest number of hours of video games per week while the youngest demographic (Pipeline) played the highest. The remaining *Man* independent variables closely followed their game-play rankings according to age, with only minor variances in stratification among the remaining four demographic groups.

Video-game frequency categorized by Major Command (MAJCOM) also provides interesting data for discussion. Air Force Special Operations Command (AFSOC) aircrew led the study in video-gaming frequency with 4.5 hours per week, exceeding all *Man* independent variables. Air Combat Command (ACC) aircrews averaged 2.3 hours per week, closely mimicking the overall study average of 2.4 hours. Finally, Air National Guard (ANG) crews played the least amount of any demographic in the study at 1.1 hours per week, less than 50 percent of the average.

Similar to the *Man* independent-variable stratifications, MAJCOM video-game playing across ACC and ANG can principally be attributed to their respective age demographics. The average age of an ACC subject was 30.0 years old, barely a year younger than the study average. The average age of an ANG aircrew was 39.4 years old, by far the oldest demographic in the study and over eight years older than the study average. AFSOC, while representing the youngest MAJCOM with an average age of 26.8 years old, was still older than the Pipeline demographic (25.7 years old) and nearly matched the demographic containing no prior combat deployments (27.4 years old). However, AFSOC exceeded these younger demographics for weekly game play by 0.6 hours and 1.3 hours per week, respectively. It appears that additional variables beyond subject age are impacting video gaming in AFSOC aircrew at a greater magnitude than other MAJCOMs.[4]

[4] Anecdotal evidence gathered during aircrew interviews at Cannon Air Force Base, an AFSOC base used in this study, indicates the lack of recreational and social activities available to military personnel in their off-duty time greatly contributes to their increased video-gaming.

Video-Gaming Discussion

In *Warrior Geeks*, Christopher Coker claims, "Today's drone pilots come from a generation of people who at the average age of twenty-seven spend an average of more than eighty hours a week in online gaming."[5] Flatly, the data collected in this study do not support such an assertion regardless of how game play or age is categorized. Overall, the 111 study participants averaged only 2.4 hours of video-game play per week. Moreover, only eight of the 111 participants reported playing at least ten hours per week, with the absolute highest reporting thirty hours per week. RPA aircrew aged eighteen to twenty-five, chosen to closely resemble the stated demographic in *Warrior Geeks,* averaged 4.9 hours of video-gaming per week. *Warrior Geeks* overstates the video-gaming patterns of RPA aircrew by more than a factor of ten.

While *Warrior Geeks* exaggerates the characteristics of current MQ-1/9 aircrew, an important question develops; 'How does the frequency of MQ-1/9 aircrew video-game playing compare with other western adults?' A 2008 Pew research study investigated the frequency of video-game playing and reported 53 percent of American adults aged 18 and over play video games in their personal time.[6] The Pew data closely matches the RPA data from table 6.1 above, where 50.5 percent of the surveyed RPA aircrew also engaged in video-

---

[5] Christopher Coker, *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War* (New York, NY: Columbia University Press, 2013), 134.

[6] A. Lenhart, S. Jones, and A. Macgill, "Adults and Video Games," *Pew Internet and American Life Project* (December 7, 2008), 1.

game play in the last three months.[7] The Pew data also demonstrated that approximately 50 percent of adults aged 18-49 are playing video games 'every day' or at least 'a few times a week.'[8] Assuming a video-game player engages between thirty and sixty minutes per session, then the Pew research participants played video games between 1.5 - 4.0 hours per week, again closely resembling the subjects in this RPA study.

Additionally, a 2010 study on video gaming published in the *Australia and New Zealand Journal of Psychiatry* by Porter et al. noted that 48.4 percent of their 1,945 survey participants spent between seven and twenty-one hours per week playing video games.[9] Comparatively, participants in the Porter study far exceed weekly video-game play by the RPA aircrew interviewed for this project. Only nine RPA aircrew (8.1 percent) reported spending more than seven hours per week playing video games and only four (3.6 percent) spent more than fourteen hours per week in game play.

While rates of video-game play among a particular demographic is a relatively straightforward and easily quantifiable statistic, the data itself is not extremely useful in developing comparisons to accepted levels of game play or predicting behavior. In their same article, Porter et al. noted a lack of clear

---

[7] The youngest RPA aircrew interviewed for this project were 20 years old, which was expected given the length of the training cycle (approximately 1.0 to 1.5 years) before an RPA aircrew would have a reasonable chance to employ a weapon in combat based on qualification and opportunity.

[8] A. Lenhart, S. Jones, and A. Macgill, "Adults and Video Games," 1.

[9] G. Porter, V. Starcevic, D. Berle, and P. Fenech, "Recognizing Problem Video Game Use," *Australian and New Zealand Journal of Psychiatry* 44 (2010):123; 97.3 percent of the survey respondents were age 14-40.

criteria for identifying excessive video-game play.[10] Arguably, statistics parading large durations of video-gaming may provide so-called 'shock value' to readers as evidenced in *Warrior Geeks*, but little in the way of comparative value. Lacking a game-play standard from which to measure, readers are left to their own accord to decide how far a particular demographic group deviates from acceptable societal norms. Thus, RPA aircrews averaging 2.4 hours per week of video-game play borders on curiously interesting but largely irrelevant given the lack of meaningful societal standards for video gaming in adults.

Additionally, as Porter articulates, the frequency or duration of video-game playing as a diagnostic tool for identifying mental health issues is largely unreliable.[11] The game play may itself be a resultant effect of other psychological issues, or the game play may actually be providing a useful and necessary mental outlet to the individual player. On this second point, consider a 2009 report by the United States' Mental Health Advisory Team (MHAT) on soldiers serving in Afghanistan. The MHAT report recommended soldiers engage in 14-21 hours per week of video gaming and internet surfing as a way to cope with stress.[12] Using the MHAT data, one could make the case that MQ-1/9 aircrew, on average, are playing *far too few* video games on their personal time.

---

[10] Ibid, 2.

[11] Ibid, 24.

[12] U.S. Forces Afghanistan, Office of the Command Surgeon. *Mental Health Advisory Team (MHAT) 6, Operation Enduring Freedom 2009, Afghanistan*, November 6, 2009, 2.

MQ-1/9 aircrew are clearly involved in video gaming during their personal lives, with Pipeline aircrew leading all other demographics with an average of 3.9 hours per week. Using the comparisons described above, RPA aircrew appear to be playing video games at a rate similar to other adults in western societies. If playing at similar rates provides one with a sense of normalcy, then society should rest assured that RPA aircrew fit within this characterization. However, as Porter and the MHAT report have shown, absolute comparisons of video-game play do not necessarily equate to an increase or decrease in mental health issues. Closing this discussion on video-game play leaves one looming question first raised in chapter 3; 'Do RPA aircrew think their job feels or acts like a video game?' This important facet of video gaming in the RPA community will be addressed in the cognitive domain discussion.

Conclusion

Across the social domain, *Man* independent variables continue to provide intriguing differences and trend data among those charged with killing via RPA but have thus far lacked any magnitude of statistical significance. Overall, sensor operators and pilots with mobility/reconnaissance background reported the highest social-domain response rates. Additionally, sensor operators and less-experienced aircrew continue to demonstrate trend data indicating an increased rate of negative psychological responses. *Machine* independent variables were not responsible for any reported social impacts. *Mission* independent variables based upon target familiarity also resulted in no social impact while social impacts due to friendly forces in danger, near or actual collateral damage, and near or actual unintended casualties were not measured.

Furthermore, we cannot make a leap and state whether RPA aircrew are mentally engaged in their work based solely upon the results from a single domain. While 69 percent of subjects reported a first-strike response in the emotional domain, only 17 percent reported a response in the social domain. Further judgment must be withheld until a fuller picture can be developed with assistance from the cognitive domain and case discussions.

In regard to video-game frequency among RPA aircrew, the rates are similar to other studies of western adults. However, the rate of video-game play among RPA aircrew provides little evidence to support or refute their mental connection to their deadly work. Further inquiry is needed in the cognitive domain to better develop a picture of how RPA aircrew *approach* their work environment in order to fully understand the varied considerations and critiques surrounding the topic of video games and RPA aircrew.

Chapter 7

Cognitive Domain Results

Introduction

Cognitive responses to killing involved interview questions regarding what RPA aircrew think about killing, how they view their mission, and their overall sense of realism and mental connection to combat operations. *Man independent* variables provide the focus of analysis in the cognitive domain.

Primary comparisons are made using the following *Man independent* variables:

1. Pipeline aircrew *versus* Aircrew with prior manned aircraft experience
2. Aircrew with no prior combat deployment *versus* Aircrew with prior combat deployment
3. RPA pilots *versus* RPA sensor operators

Secondary comparisons across *Man independent* variables are used to examine differences between RPA pilots with fighter or bomber-aircraft experience and RPA pilots possessing prior mobility or reconnaissance-aircraft background. Finally, interview respondents are quoted to provide additional detail and insight regarding their psychological response.

Results

First-Strike Cognitive Responses

First-strike cognitive responses were categorized according to the tree diagram presented in chapter 4. An updated tree diagram with accompanying data is presented in figure 7.1 below. Notable features of figure 7.1 include:

1) On the first branch of the tree diagram, participants were restricted to a polar 'yes' or 'no' response regarding whether they experienced any significant cognitive response. In subsequent levels of the tree diagram, participants were permitted to report multiple conditions (positive & negative, short & long, etc.).

2) Regardless of level on the tree diagram, percentages reported for each condition are measured against the overall study population of 111 participants.

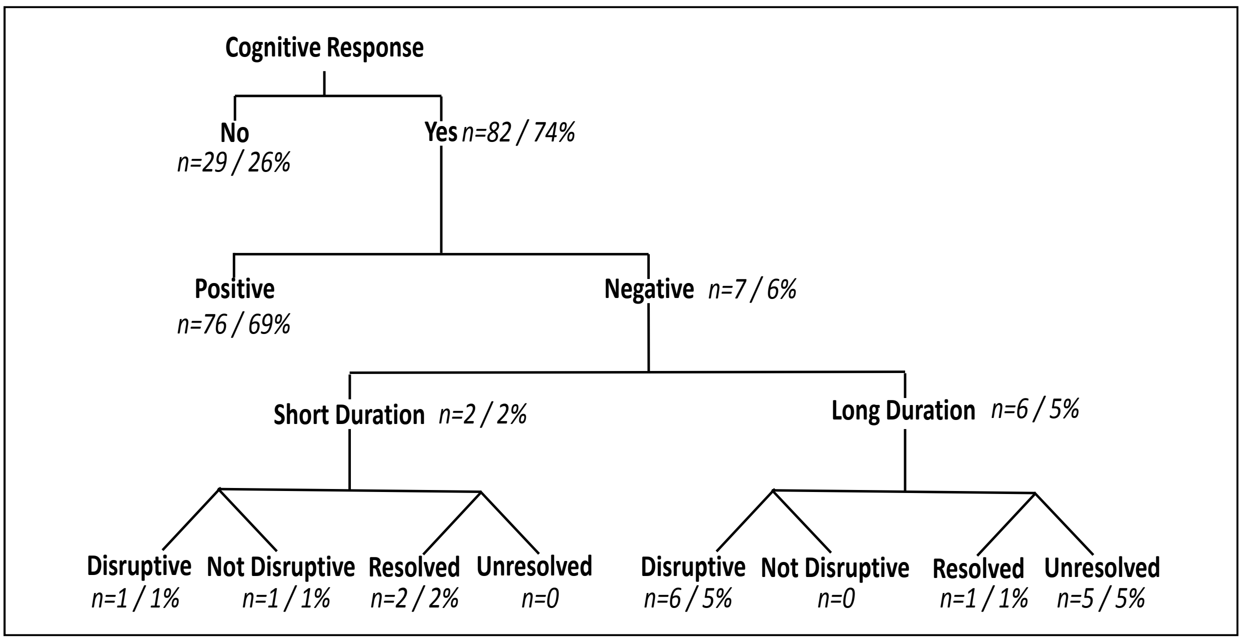


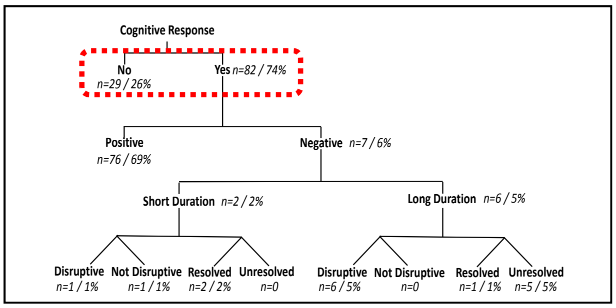
Figure 7.1. First-Strike Cognitive Response Tree Diagram

Descriptions of significant cognitive responses included the following:

- Positive: Desire to improve as an aviator, desire to help others, desire to help the squadron, desire to keep doing the job, desire to remain in RPA, became confident in abilities and sought additional missions

- Negative: Desire to work somewhere else, desire to cease flying RPA, aversion to killing via RPA

Any First-Strike Cognitive Response



Eighty-two interview subjects (74 percent) reported a significant cognitive response to their first kill. Figure 7.2 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest percentage of strikes with a cognitive response (n=30 / 85.7 percent) while aircrew with a prior combat deployment reported the lowest percentage of first strikes with a cognitive response (n=41 / 67.2 percent). Chi-square and Fisher Exact Probability Tests revealed no significance between any of the aircrew background independent variables in figure 7.2 (α = 0.05).

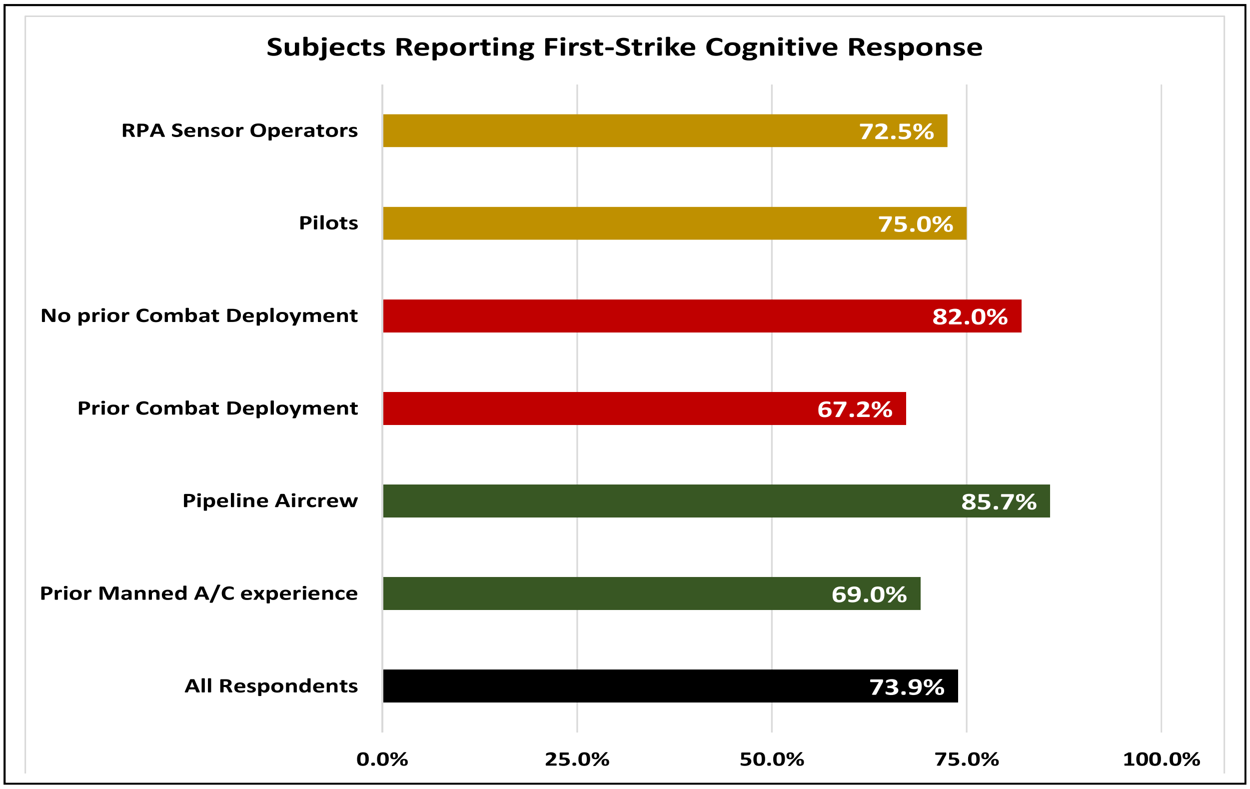


Figure 7.2. First-Strike Cognitive Response Rate

Positive First-Strike Cognitive Response

Seventy-six interview subjects (69 percent) reported a positive cognitive response to their first-strike. Figure 7.3 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest percentage of strikes with a positive cognitive response (n=27 / 77.1

percent) while aircrew with a prior combat deployment reported the lowest percentage of first-strikes with a positive cognitive response (n=38 / 62.3 percent). Chi-square and Fisher Exact Probability Testing revealed no significance between any of the aircrew background independent variables in figure 7.3 ($\alpha = 0.05$).

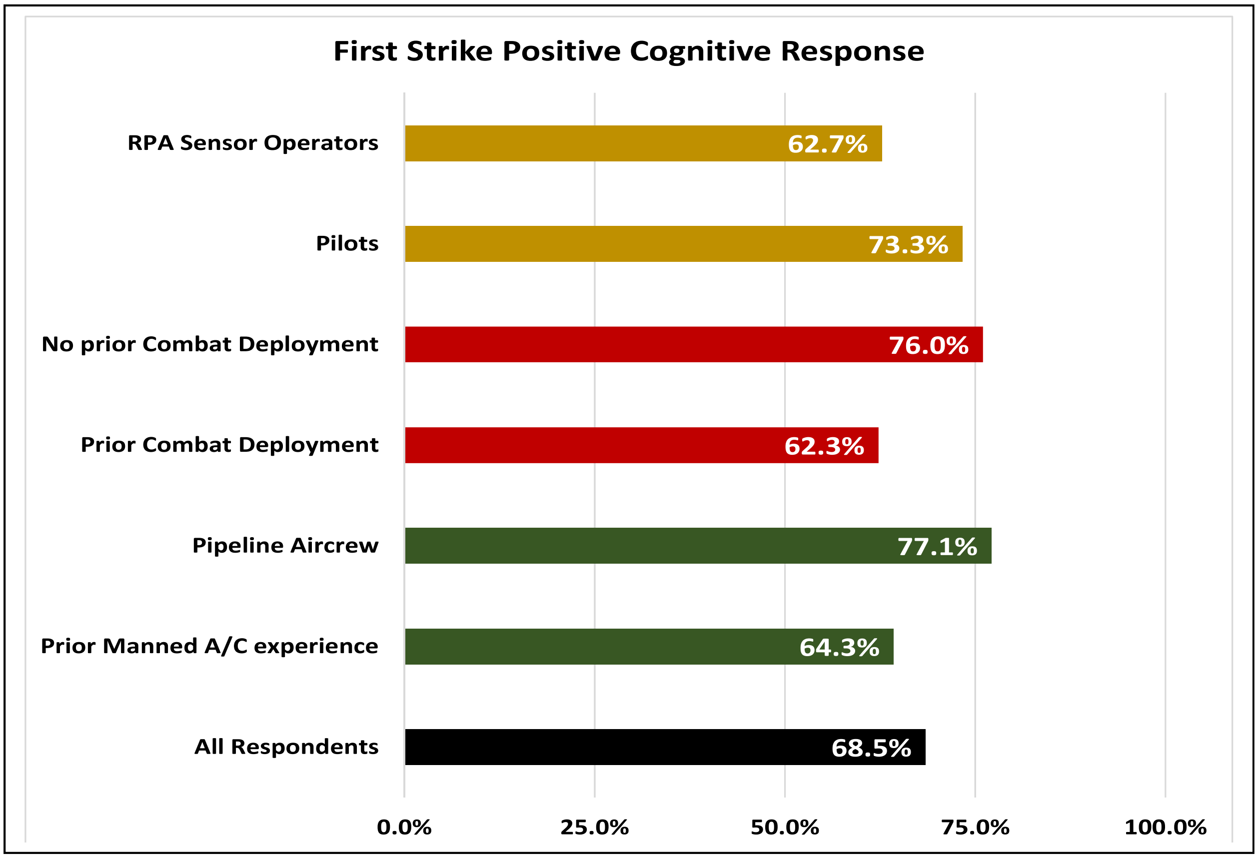
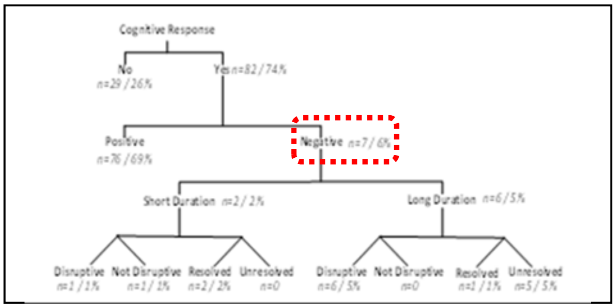


Figure 7.3. First-Strike Positive Cognitive Response Rate

Negative First-Strike Cognitive Response



Seven interview subjects (6 percent) reported a negative cognitive response to their first strike. Figure 7.4 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest rate of first-strikes with a negative cognitive response (n=4 / 11.4 percent) while pilots reported the lowest rate (n=1 / 1.7 percent). Fisher Exact probably testing was significant for sensor operators versus pilots (p=0.05), with sensor operators reporting a negative cognitive response over five-times the pilot rate. Chi-square and Fisher Exact Probability Testing revealed no significance between any of the remaining demographic pairings. However, aircrew lacking a prior combat deployment and Pipeline aircrew continued to report higher rates of negative psychological responses as compared to their demographic pairs.

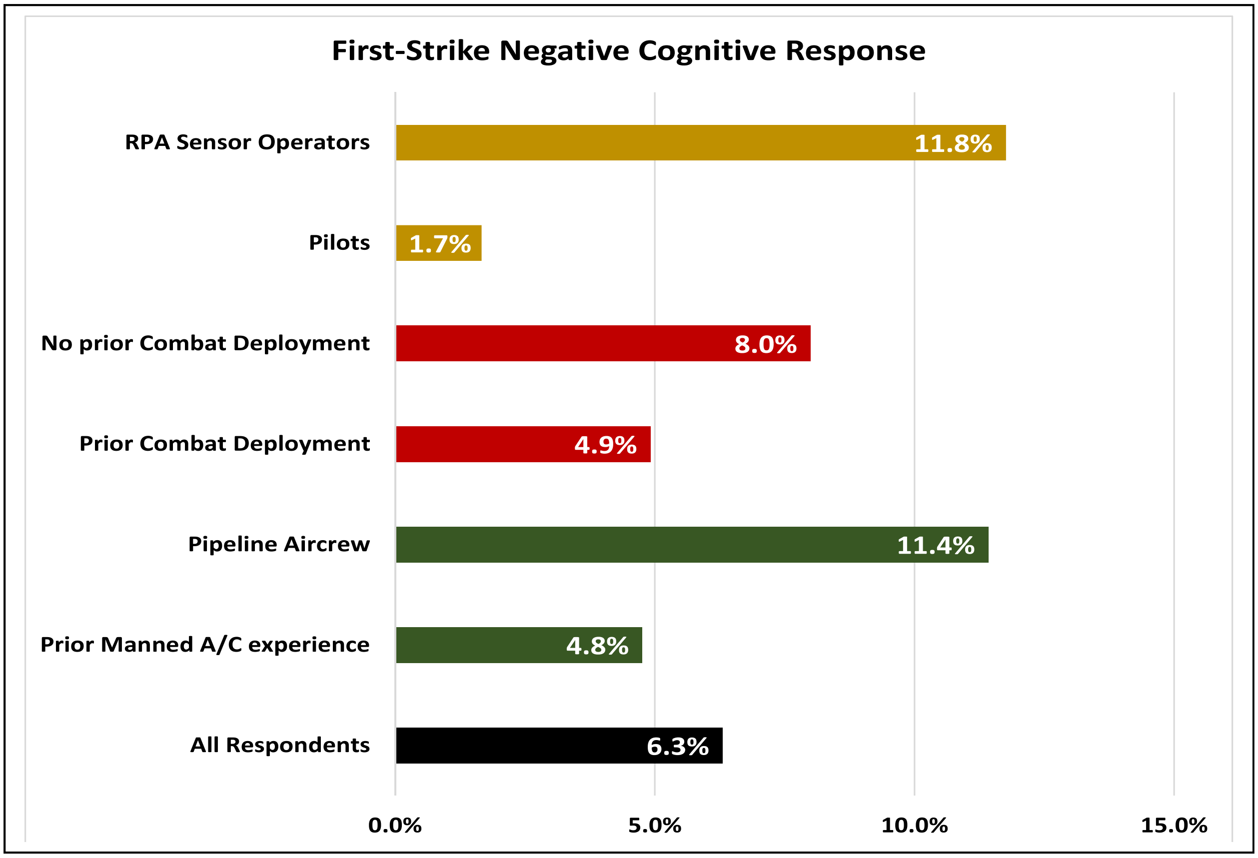
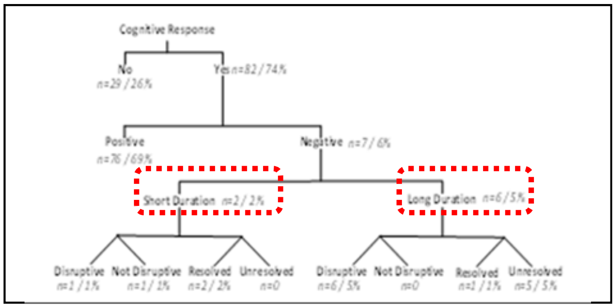


Figure 7.4. First-Strike Negative Cognitive Response Rate

Secondary analysis of the *Man independent* variables revealed prior fighter/bomber pilots displaying a zero response rate for negative cognitive responses. Consequently, prior fighter/bomber aircrew did not report any disruptive or unresolved cognitive responses to their first-strike as well. One prior mobility/reconnaissance pilots reported a negative cognitive response, but this was not statistically significant when compared against the fighter/bomber demographic. Similar results for the prior mobility/reconnaissance demographic were reported for long duration (n=1), disruptive (n=1), and unresolved cognitive response (n=1), but all instances failed to yield statistical significance or outlying trend data when compared against the prior fighter/bomber pilot demographic.

Short and Long-Duration Negative Cognitive Responses



Two interview subjects (2 percent) reported a negative cognitive response to their first kill lasting less than forty-eight hours. Six interview subjects (5 percent) reported a negative cognitive response to their first kill lasting longer than forty-eight hours. Across the *Man independent* variables, sensor operators reported the highest rate of short-duration (n=2 / 4 percent) and Pipeline reported the highest rate of long-duration (n=4 / 11 percent) negative cognitive response. While statistical analysis revealed no significance in the differences across *Man* independent variables, several trends continued. Sensor operators, aircrew lacking a prior combat deployment, and Pipeline aircrew all reported higher rates of short and long-duration negative cognitive responses when measured against their comparative demographics.

Negative Disruptive First-Strike Cognitive Response

Six interview subjects (5.4 percent) reported a negative cognitive response that resulted in disruptive behaviors to their professional or personal lives.[1] This statistic includes disruptive behaviors resulting from both short and long-duration negative cognitive response.[2] The most common negative cognitive response was a desire to transfer to another job. Figure 7.5 below depicts these responses categorized across *Man* independent variables, allowing for only a single instance of disruption per subject to remove any double-counters. Sensor operators reported the highest percentage of first-strikes with a disruptive cognitive response (n=5 / 9.8 percent) while pilots reported the lowest rate of disruptive response (n=1 / 1.7 percent). Although sensor operators reported a disruptive rate nearly five times higher than pilots, Fisher Exact Probability testing was insignificant (p=0.09). The remaining *Man* independent variables were statistically insignificant as well.

---

[1] See chapter four for further definition and discussion on disruptive behavior.

[2] The cognitive tree diagram shows seven total instances of disruptive cognitive response in the short and long-duration sub-categories. One individual reported in both short and long categories, counting twice. Hence, six total persons reported disruptive behaviors due to cognitive response.

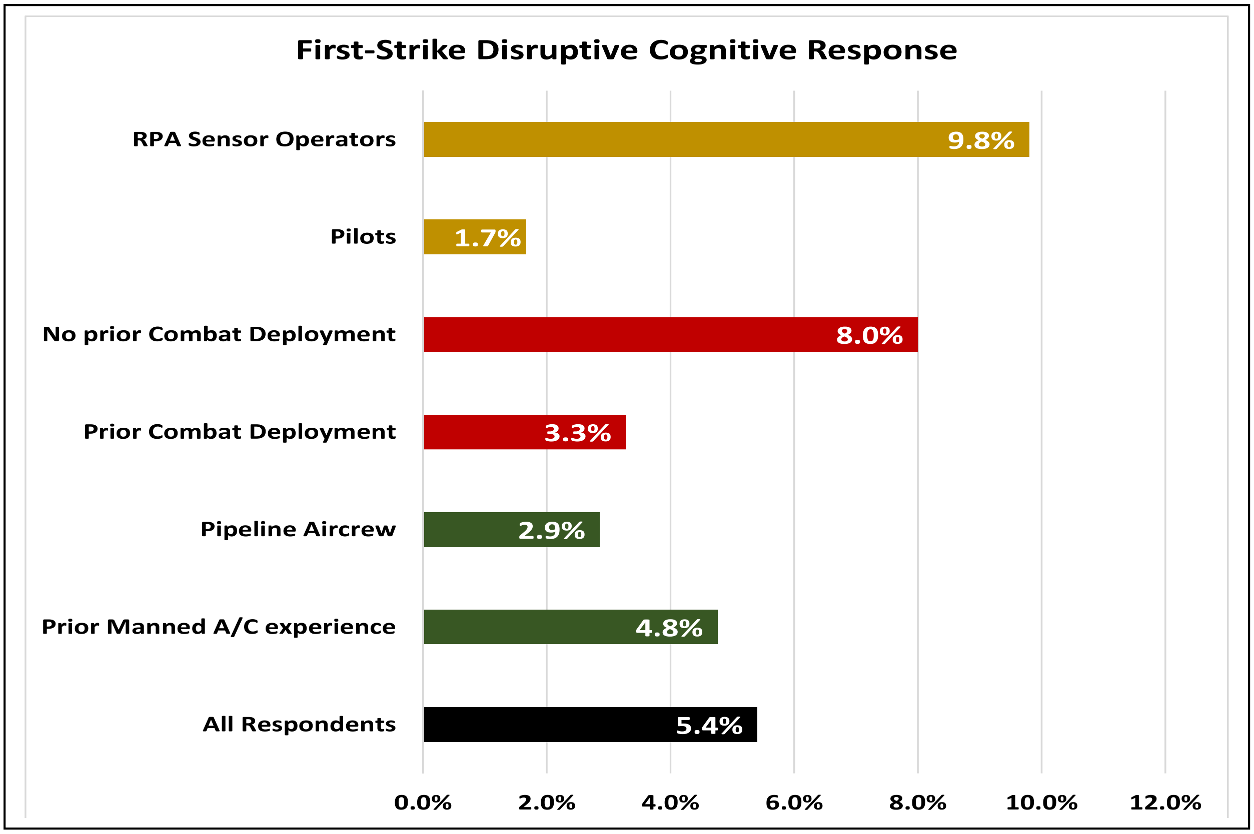


Figure 7.5. First-Strike Negative Disruptive Cognitive Response Rate

Aversion to Killing

Closely related to disruptive cognitive response is a question regarding whether RPA aircrew have ever purposely opted out of flying or a possible strike mission due to killing aversion. 37.5 percent of respondents stated they had opted out of flying or a strike mission, with the most common cause cited as fatigue due to shift work. However, four respondents (4 percent) stated they had opted out of a strike due to 'feeling uncomfortable' with the killing. Two of the three subjects stated they overtly informed their squadron leadership concerning their aversion to killing. The other two individuals claim they were able to manipulate the flying schedule without shining light on the true reason the schedule had been altered. Additionally, four other interview subjects stated they were averse to killing via RPA but would still perform the mission out of a sense of duty or not letting down other members of the squadron. Finally, RPA aircrew, even ones who wished to opt out but chose to continue with the mission, provided additional commentary on this topic during the interview process.

> - "If I had the choice, I would not strike. I'll do it if required, but won't ask for it. I don't feel guilty about what I did, but I would prefer to not kill others."
>
> - "I'm averse to killing. But if I have to do it, I will."
>
> - "I don't enjoy shooting. If I can relinquish it to someone else, I will."
>
> - "If I don't do it [shoot], somebody else will have to."
>
> - "We had one guy in my squadron that didn't fly a particular line due to his concerns about killing. Everybody knew it."
>
> - "I flew a mission with a pilot who was also experienced in the squadron, but we had not previously flown together. One of the first things he said to me was, 'I hear you are a guy that likes to shoot…we'll I'm not a shooter, so forget about it today.' I finished the sortie and then refused to ever fly with that pilot again. I have no respect for **** like that…guys like that are putting our friendly ground forces at increased risk because they won't do their jobs."

Negative Unresolved First-Strike Cognitive Response

Five interview subjects (4.5 percent) reported an unresolved negative cognitive response from their first weapons engagement, with all five reported in the long duration category. Figure 7.6 below depicts these responses categorized across *Man* independent variables. Pipeline aircrew reported the highest percentage of strikes with an unresolved cognitive response (n=3 / 8.6 percent) while pilots reported the lowest unresolved rate (n=1 / 1.7 percent). Chi-square and Fisher Exact Probability Tests revealed no significance between any of the aircrew background independent variables in figure 7.6 ($\alpha = 0.05$). Sensor operators, Pipeline aircrew, and aircrew lacking a prior combat deployment all reported higher rates of unresolved cognitive response than their corresponding demographic pairs.

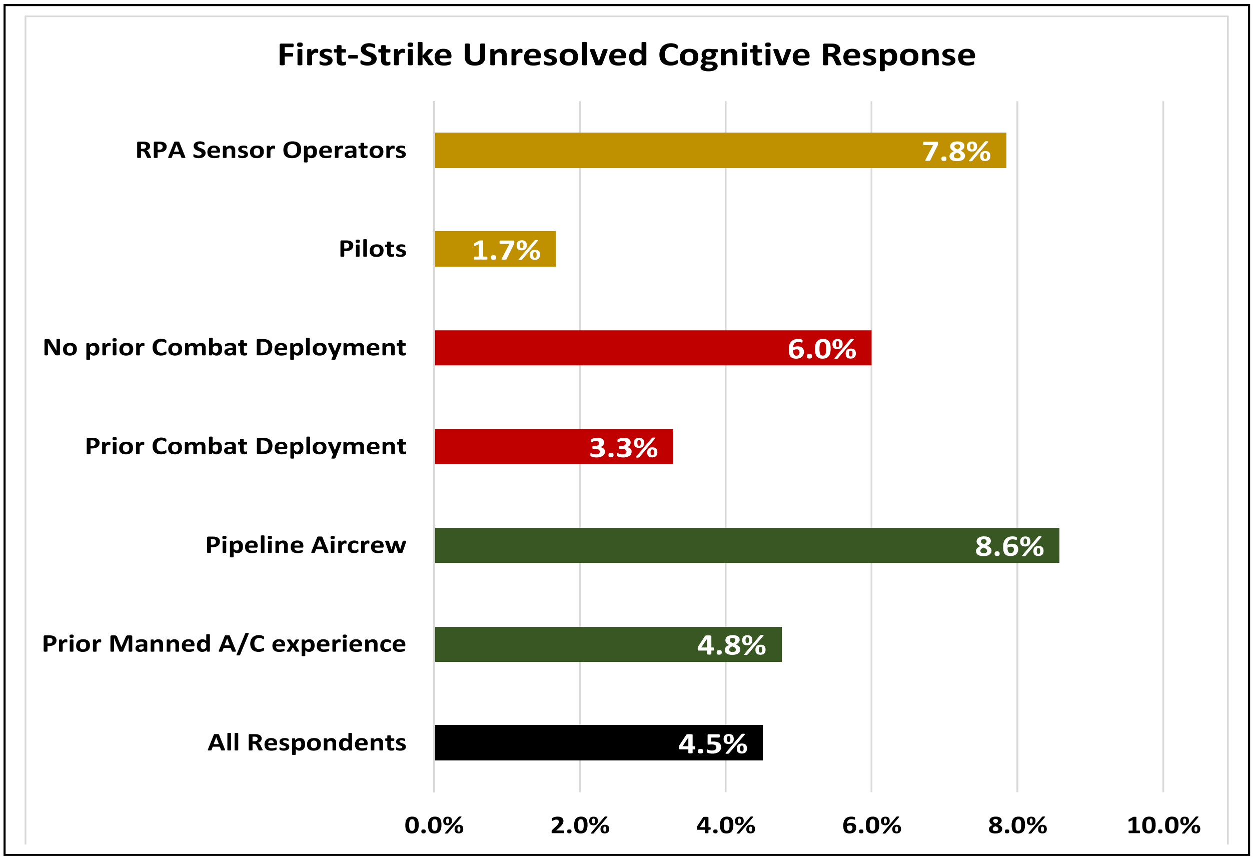


Figure 7.6. First-Strike Negative Unresolved Cognitive Response Rate

Interview Commentary

While figures 7.1 through 7.6 display the statistical results of first-strike cognitive responses, actual interview responses provided much greater detail regarding the spectrum of cognitive response RPA aircrew experienced following their first kill.

- "It's ok. Hours and hours of staring at nothing can get to you. I don't care to do this long term.
- "It's stressful, but a privilege to be here. But I don't know if I'll stick with it."
- "I get job satisfaction from keeping our guys safe. I have more job satisfaction here than in security forces."

- "I like it. It's important…I've carried everything possible in the C-17; medical patients, President Karzai, human remains…but here I can see the tactical, operational, and strategic impact on what I do."
- "I'm saving good guy lives. The mission motivates me."
- "It's about supporting the ground units, not taking life."
- "I like it a lot better than maintenance. We are more part of the mission."
- "My previous jobs were just jobs. I'm a big contributor now."
- "I like seeing the mission impact I'm having. We didn't get that in security forces."
- "The mission accomplishment is much bigger here, but I prefer manned airplanes."
- I love it here. It doesn't get any better than this. I am more on the front lines than in tankers."

Views regarding other RPA Aircrew that have killed

Related to their personal cognitive response to killing is an idea that subjects may view or think differently about other RPA aircrew that have employed weapons and killed in combat. Figure 7.7 below depicts RPA aircrew who view other aircrew who have employed weapons and killed differently. Across *Man* independent variables, pilots and aircrew with manned-aircraft experience reported the highest rate of viewing 'shooters' differently. Conversely, sensor operators reported the lowest rate of viewing other 'shooters' differently. Chi-square and Fisher Exact Probability Tests revealed no significant statistical significance between any *Man independent* variables in figure 7.7 ($\alpha = 0.05$). Secondary analysis revealed pilots with prior fighter/bomber experience reporting the highest rate thinking differently about fellow 'shooters' (n=6 / 60 percent).

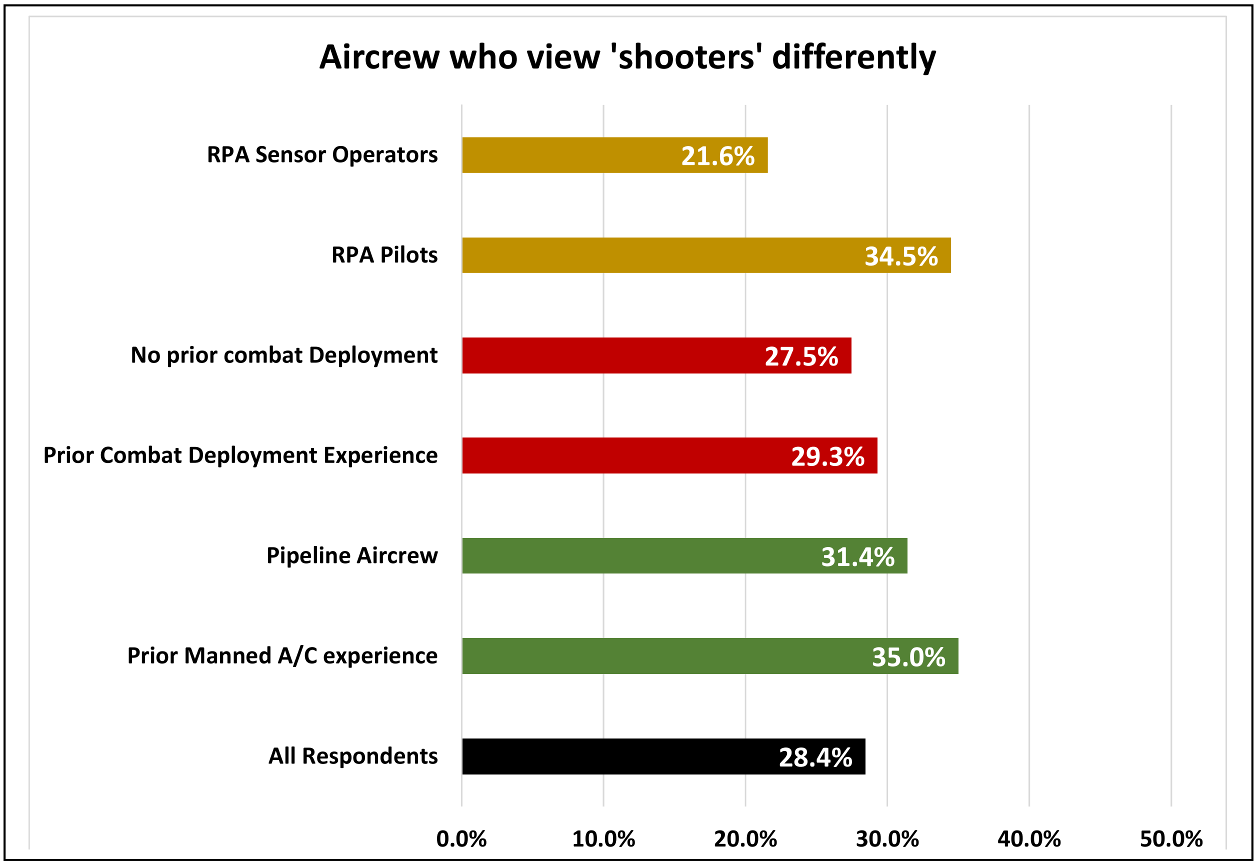


Figure 7.7. Subjects who view fellow 'shooters' differently

Across the nearly three-quarters of interview subjects that denied thinking differently about 'shooters,' the most common reason cited was a focus on professional flying abilities rather than employment experience. For many, shooting in combat represents 'luck of the draw' given the large number of flying hours and missions generated between the requirement to employ weapons and kill. Regardless of their fellow aircrew's combat record, almost all interview subjects stated they were acutely aware of the strengths and shortcomings of nearly every aircrew they worked with on a regular basis.

Interview responses provide additional insight into the rationale for separating fellow aircrew into distinct categories.

- "Untested dudes make me nervous."
- "Guys who've killed have crossed that line with me. We are different. Guys who haven't shot don't know what it's like."
- "Striking is street cred, whether you admit publicly or not. Even guys who are good, but haven't struck, haven't proven themselves."
- "I only separated people by those I trust and those I don't."
- "Yes, because you don't know how a guy will perform until he's tasked."
- "Guys who've employed have proven themselves."
- "New guys can't understand it because they haven't taken a life."
- "You never know what's going on with a guy until he does it [kills]."
- "I take their critiques less seriously if they haven't shot."
- "Not shooting is another way to tell who's the bus drivers around here."

Mental Connection to Combat

Interview subjects were also queried on their mental connection to combat given the vast physical distance separating them from their aircraft, their targets, and the combat environment. This question was the first of two questions aimed to gauge the mental connection and video-gaming perceptions of RPA combat operations. Figure 7.8 below depicts the percentage of RPA aircrew who stated they feel mentally disconnected from combat operations while flying RPA. Overall, 16.3 percent of interview respondents stated they sometimes or frequently felt mentally disconnected from combat operations while flying RPA. Pipeline aircrew reported the highest rate of mental disconnection from combat operations, while aircrew with a prior combat deployment reported the lowest. Although aircrew without a prior combat deployment reported mental disconnection at over twice the rate of those with prior combat experience, the results were insignificant (p=0.24). Chi-square and Fisher Exact Probability Tests revealed no significance between the remaining *Man* independent variables in figure 7.8 (α = 0.05).

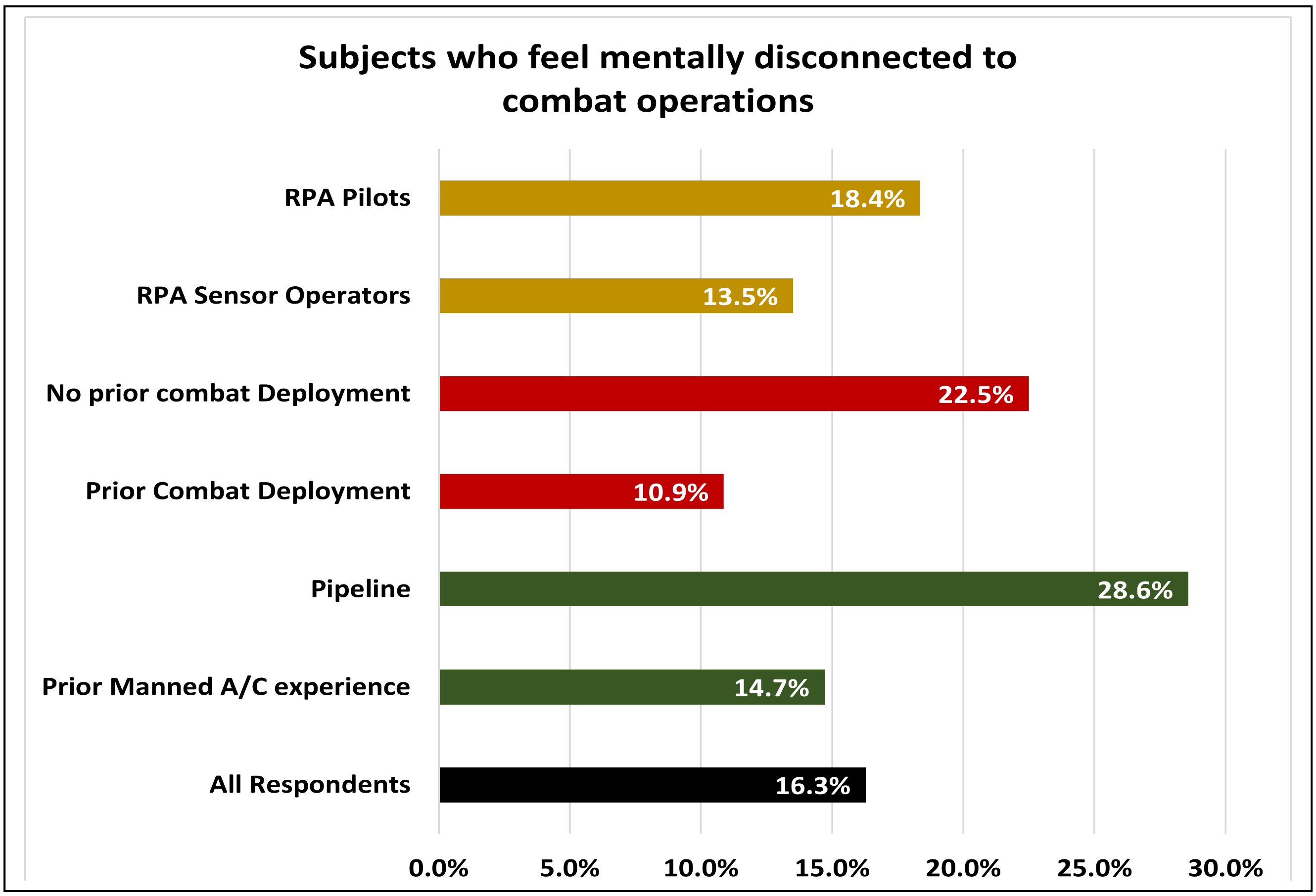


Figure 7.8. Subjects who are mentally disconnected to combat operations

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

Secondary analysis of the *Man* independent variables revealed prior mobility/reconnaissance pilots reporting mental disconnection at a rate of 17.4 percent (n=4) while prior fighter/bomber pilots reported no mental disconnection (n=0). Fisher Exact Testing between these two demographics was insignificant and heavily influenced by the small sample size and response rates.

Additional analysis on the fourteen total subjects who reported feeling mentally disconnected revealed possible dissonance in their responses upon juxtaposition with their first-strike discussions. Despite stating they were mentally disengaged from their work, thirteen of the fourteen aircrew reported first-strike psychological responses across at least one of the emotional, social, or cognitive domains. Furthermore, ten of the fourteen 'mentally disconnected' subjects reported a first-strike psychological response across at least two domains.

Finally, interview responses provide illuminating detail on individual aircrew thoughts regarding mental disconnection, how they avoid it, or why it exists when they operate RPA.

- "It's more connected. I watch the aftermath of my work and bodies get picked up and buried. I watch the grieving and funerals."
- "It's not as intimate as killing face-to-face. But, it still feels real."
- "This job is extremely personal and we are extremely connected."
- "We have real effects. Just because we're not next to them doesn't change things."
- "It's weird to fly, then do office work, then fly."

- "Talking to JTAC [ground controller] on radio made me feel like I was flying in Afghanistan."
- "I'm in the aircraft mentally. Geographic separation is not a factor."
- "I have to remind myself this is real. This is a real plane."
- "Once I'm in the cockpit, I feel like I'm there."
- "I want to be disconnected. It helps me prevent the remorse."
- "I felt less connected while deployed than I do here. An F-16 pilot uses a targeting pod [camera]. Why is that more real?"
- "I've been there. I know what these guys [friendly ground forces] go through."
- "I feel disconnected in the satisfaction of my work due to the distance."
- "I say 'we were there' because there is no separation to me."
- "When I'm physically here, I'm mentally there [in combat]."
- "I'm more mentally connected than if I flew an F-16. I watch body parts get gathered. I watch funerals."
- "I'm more mentally connected than in B-52."
- "I felt a lot more disconnected in my [manned aircraft] than I ever felt here."
- "I feel closer to the fight here than in the C-17."
- "I transpose my brain 6,000 miles away. When I step into that cockpit, I'm in Afghanistan."
- "I'm not disconnected, but this job is definitely a buffer to war."
- "I'd rather be there, but the tools we have make me feel immersed."
- "The [camera] creates a barrier for me."

RPA operations as a video game

As a follow-up to the discussion on mental disconnection, subjects were asked if they felt flying RPA was the same or similar to playing video games and whether any comparison to video gaming was a valid discussion to pursue.

RPA aircrew were unanimous in their statements that RPA operations are not a video game. Regarding any comparative discussion with video games, only 15 percent of respondents stated they understood why a video-game comparison could be made. Figure 7.9 below displays the remaining 85 percent of RPA aircrew who stated any comparison to video games is an invalid discussion, broken down across *Man* independent variables. Sensor operators reported the highest rate of feeling any comparison to video games is an invalid discussion while aircrew with prior manned-aircraft experience reported the lowest rate.

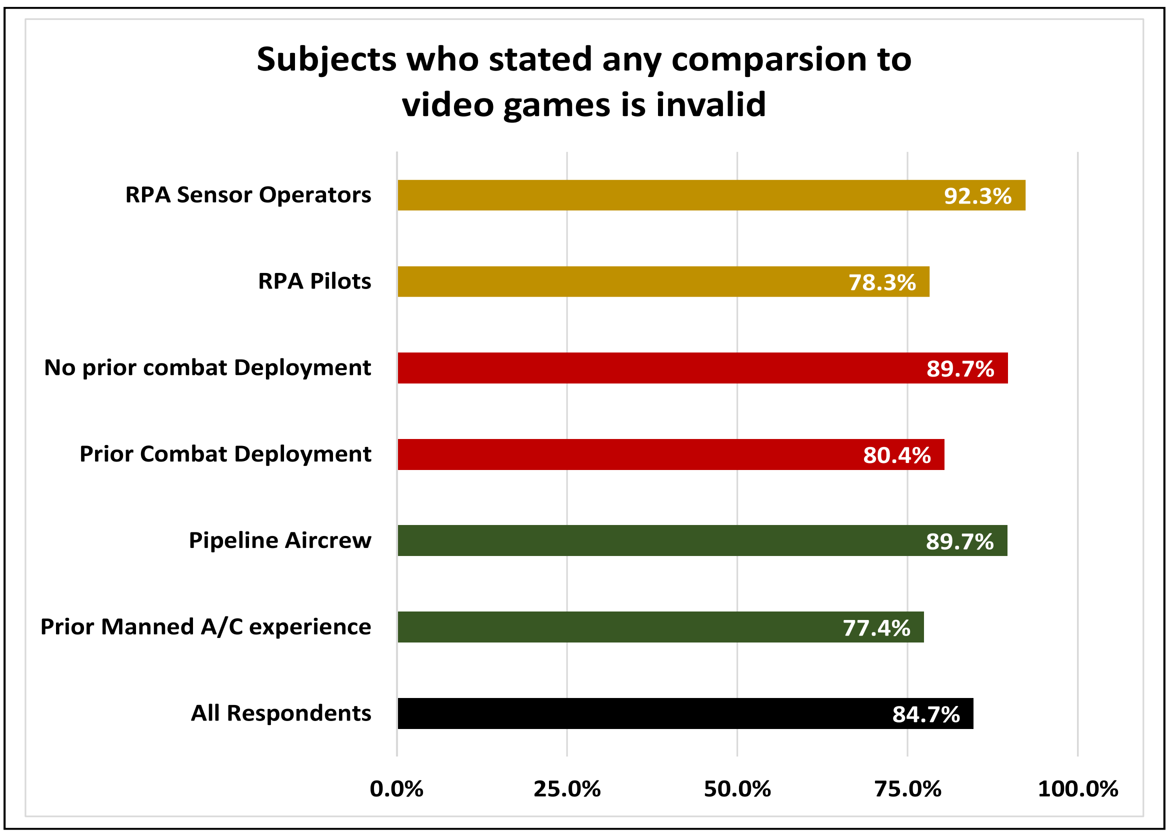


Figure 7.9. Subjects who stated any comparison to video games are invalid

An additional feature regarding the RPA comparison to the video-gaming statistic is the relationship to weekly video-game play across *Man* independent variables. The three demographics reporting the highest levels of weekly video gaming (Pipeline, Sensor operators, & no prior-combat deployment) also reported the highest levels of unwillingness to consider any video-gaming comparison to RPA as a valid discussion. Conversely, the three demographics reporting the least amount of video game play per week (prior combat deployment, pilots, & prior manned-aircraft experience) were the most agreeable to a comparison of video gaming and flying an RPA.

Subject responses regarding their views on video gaming comparison to RPA also provide illuminating details.

- "Watching this through a video is not equal to a video game. I'm not a child…this is not fiction."
- "Somebody is dead due to our actions. It's not a video game. People's lives are on the line."
- "It's nothing like a video game. Nobody gets hurt in video games. I hate that comparison."
- "In [intelligence gathering] mode it's like a video game. But as soon as we enter strike mode, a mental switch happens instantly."
- "It's just like a [manned aircraft] targeting pod [camera]. I know it's real."
- "It's real. If it was a video game, I'd be pulling the trigger every day. Weather and other stuff reminds you its real."
- "This is no different than looking through a [manned aircraft] targeting pod [camera]."
- "I see basic patterns of life. Their kids look like my kids. That's real life."
- "Its life, not a video game."
- "When I first started doing it, it felt like a video game. After my deployment, it felt real."

- "I see personal interactions. People doing everyday stuff."
- "Video games have a reset button. This doesn't."
- "It's insulting when people call it a video game. You can't reset a video game. These guys are dead…there is no reset."
- "It's not a video game. It's stressful, serious, complicated. Calling it a video game detracts from what we are doing."
- "It's just real to me. Having computers and a video monitor doesn't make it a game. My actions have real consequence."
- "Video games have better graphics. I'm immersed in it. You can pause a video game…but this has professionalism and seriousness."
- "You have to remind yourself its real. It's more like a video game during [intelligence gathering]. But once you talk about kinetics [weapons], it's obvious this is not a game."
- "Putting it on a video screen doesn't make it a game. Can you distinguish a sitcom from the nightly news?"
- "What makes it real? There's no start over if somebody dies."
- "People outside our community are not even worth my time in having this discussion."
- "I try not to talk with people about what I do, they don't understand it. Real people are dead due to my actions."
- "I know it's not a video game. This isn't make believe. Civilians just don't understand. If I was playing a video game I could hit reset."
- "It's not a **** video game. Nothing in a video game is like this. There are real people on the ground."

Discussion

Man independent Variables

Review of the preceding data on cognitive response to killing illuminates several trends for discussion across the cognitive domain. Similar to the emotional and social domains, Pipeline aircrew, sensor operators, and aircrew without a prior combat deployment exceeded the negative response rates of their demographic pairs in nearly every category. Moreover, sensor operators reported the highest rate of negative cognitive response across any demographic in three categories (overall negative response, short-duration negative response, and negative disruptive) while Pipeline aircrew reported the highest rates in the remaining two negative categories (long-duration negative and unresolved). Sensor operators reported the only statistically significant finding in the cognitive domain; first-strike negative cognitive response rate.

Prior fighter/bomber aircrew continued their previous trend of possessing the lowest negative response rate across *Man* independent variables, reporting zero negative cognitive responses. Prior fighter/bomber aircrew also reported the highest rate of thinking differently about fellow 'shooters' (60 percent), approximately twice the rate of prior mobility/reconnaissance pilots and the overall study population.

Aversion to Killing

In searching for RPA aircrew who are averse to killing, responses were multi-faceted despite the polar focus of the question. Four subjects stated they had purposely opted out of a mission due to their aversion to killing. Additionally, four other interview subjects stated they were averse to killing via RPA but would still perform the mission out of a sense of duty or not letting down other members of the squadron.

These aircrew conflicted on killing resemble the Israeli snipers interviewed by Bar and Ben-Ari in the early 2000s. Bar states, "Snipers continue to do their work in a cool and calm manner out of a full belief in the justice of their cause. Indeed, the belief that they are preventing the next terror attack or suicide bomber is a key motivator for them."[3] For the RPA aircrew who reported aversion to killing, it appears the mission and their bond with their unit motivates them to continue their job despite any reservations.

These examples of RPA aircrew expressing their aversion to killing, whether they actually opted out of the strike or chose to go through with the mission, resembles much of the theory outlined by Grossman and Marshall in chapter three regarding human being's natural resistance to killing. The major difference in the RPA community is the vast physical distancing separating

[3] N. Bar and E. Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," *Third World Quarterly* 26, No. 1 (2005):149.

assailants, leading Grossman to state the resistance to killing is all but dissolved.

> Another key factor in overcoming the resistance to killing is distance. The utility of weapons that kill from afar cannot be truly understood without understanding the psychological enabling aspect of distance. Simply stated, the farther away you are the easier it is to kill. Thus, dropping bombs from 20,000 feet or firing artillery from two miles away is, psychologically speaking, not at all difficult (and there is no indication of any noncompliance in these situations).[4]

As this study has shown, however, there is noncompliance occurring in the RPA community. At least four aircrew have taken definitive actions to prevent killing and four others wished they could avoid the killing but did not act to prevent their participation. Moreover, ten aircrew have been removed from flight duties over the past four years at one of the operational wings due to aversion to killing.[5]

Finally, when aircrew were asked whether they had come close to employing weapons without finishing the kill, twenty-two subjects provided examples where their personal intervention in a mission likely prevented unintended casualties. All twenty-two stories were remarkably similar. In each story, the aircrew were directed to strike a target, but something just 'did not feel right' to them regarding the situation, the target identification, or the

---

[4] Dave Grossman and Loren W. Christensen, *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace.* 3rd ed. (Illinois: Warrior Science Pub., 2008), 203.

[5] Jeremy Haskell, 432 Wing Operational Psychologist, Creech Air Force Base, Nevada, email to author, January 8, 2015.

surrounding area. In every case, the aircrew took positive steps to understand the situation, develop their own mental model of the battlespace, and then recommend (or demand) a different course of action besides immediate RPA weapons engagement. All twenty-two individuals steadfastly believe that had they simply followed directions without delay and further critical inquiry, unintended casualties were nearly assured. If killing from a distance is so easily performed in the manner claimed by Grossman, we should not expect to have over twenty MQ-1/9 aircrew claiming they waited, contemplated, and acted against killing because they were concerned with the death and destruction resulting from their actions.

Mental Disconnection

RPA aircrew indicated a high level of mental connection with their work despite the vast distances separating them from the aircraft and the combat environment. Thirteen of the fourteen aircrew who stated they felt mentally disconnected also reported psychological responses to their first kill, a notable dissonance in the responses. Moreover, all fourteen claimed RPA operations are not a video game.

One possible explanation to this inconsistency is the level of involvement afforded to aircrew supporting a mission from several thousand miles away. Several aircrew stated a desire to be physically present in the combat theater, providing them a greater opportunity to interact, plan, and debrief with the ground personnel they are charged with supporting. The lack of physical presence reduces the amount of interaction between aircrew and the ground personnel they support, providing less 'buy-in' to the overall mission and less understanding of the details and nuances of the ground commander's plan. In this light, the personnel stating they felt mentally disconnected may have been referencing the overall mission, their understanding of it, and their ability to provide input during the planning process. This concept explains why an individual can feel mentally disconnected with the mission, yet still exhibit a psychological reaction to killing.

The situation just described is not exclusive to RPAs, however. Both manned fighter and bomber aircraft transit hundreds and sometimes thousands of miles to support friendly ground forces. These manned aircraft crews also lack an ability to physically interact, plan, and debrief with the ground forces they support. In many cases, their interaction with friendly ground forces is equal to, or even less, than the MQ-1/9 aircrew.[6]

Finally, the rate of mental disconnection among prior mobility/reconnaissance pilots, the fourth highest among all demographics, is an outlier demanding further consideration for trend analysis in combination with the domain responses. We should rightly assume prior mobility/reconnaissance pilots have a foundation of warfare that enables them

[6] The MQ-1/9 has the requirement to provide a launch-and-recovery element (LRE) somewhere in the theater of operations, reducing the opportunity for over-the-horizon support previously demonstrated by B-2 aircraft flying from the continental United States to strike targets on the other side of the world.

to mentally engage in RPA operations with a deeper connection and understanding than other aviators given both their manned aircraft and combat-deployment experience. This assumption proves valid across the prior fighter/bomber demographic (lowest rate of mental disconnection) and prior combat deployment demographic (second-lowest rate of mental disconnection). But the assumption does not result in the expected outcome across the prior mobility/reconnaissance demographic.

Video Gaming

In a 2013 article, Georgetown professor Eli McCarthy claims current RPA aircrew have a 'video-game' mentality.[7] This critique is neither original nor unique, as commentary from Royakkers, Alston, Calhoun, and others presented in chapter three were similar in focus and approach. The data presented here, however, do not support these claims. None of the one-hundred and eleven interview subjects stated they ever approached RPA operations as a video game or ever thought of their job as a video game. Moreover, only one in six RPA aircrew considers any comparison between RPAs and video games a valid discussion. During the interviews, the video-gaming question often drew lengthy and sometimes heated responses as interview participants answered the critiques. Anecdotally, it appears interview subjects are well aware of the video-game comparison and wanted to respond. Many of

[7] Eli McCarthy, "What are Drones Doing to Us?" *America*, April 2, 2013. http://americamagazine.org/content/all-things/what-are-drones-doing-us

the respondents noted their families and friends had previously raised the video-game comparison, so this was not the first time they had engaged in this discussion or been asked to formulate their thoughts and opinions on the issue.

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

CONCLUSION

RPA aircrew displayed a high level of first-strike cognitive response across all *Man* independent variables, with similar levels of overall response and positive response to the emotional domain. Negative psychological responses in the cognitive domain from Pipeline aircrew, sensor operators, and aircrew lacking a prior combat deployment were higher when compared to their demographic pairs. Moreover, sensor operators reported a statistically significant increase in first-strike negative cognitive response compared to pilots.

Aversion-to-killing data indicates that RPA aircrew, in general, are not averse to taking lives in the performance of their duties. However, some RPA aircrew are actively or passively attempting to avoid killing. Moreover, the twenty-two cases of RPA aircrew withholding weapons release by their own decision demonstrates a very high level of scrutiny in the application of lethal force. The chapter-three stereo type of an RPA aviator brimming with reckless indifference to human life and warfare simply does not hold true when measured against the data regarding these aircrew and their experiences in killing via RPA.

The aggregate level of mental engagement claimed by RPA aircrew was also high, with approximately 85 percent reporting a strong mental connection to their work despite the distance involved. Of the remaining 15 percent that felt mentally disconnected to their work, nearly all still exhibited a psychological reaction to their first-kill, raising important concerns regarding the dissonance in responses on this subject.

Finally, RPA aircrew were unanimous in their opinion that RPA operations are not a video game. Only one in six subjects interviewed thought any comparison to video gaming was even a valid discussion. Subjects that reported the highest levels of video gaming in their personal time were the least likely to consider any comparison between RPAs and video games valid.

Chapter 8

Selected Cases for Discussion

Introduction

Cases of MQ-1/9 aircrew who have killed in combat provide detail-rich stories that furnish an opportunity to develop a deeper understanding of the psychological processes and factors involved. Additionally, case methodologies enable heuristic identification of new variables and causal mechanisms that may not be readily apparent via statistical analysis. These pathways may further prove useful in follow-on theorizing addressed at the end of this chapter.

Five total cases were selected for examination, each chosen to ensure variation across the independent and dependent variables presented in chapter four. Using this approach, these five cases encompass both ‘unique’ and ‘typical’ dependent-variable responses to killing via RPA with purposeful variations in independent variables. Specifically, aircrew possessing prior manned-aircraft experience and Pipeline RPA-only experience were both chosen for presentation based on their potential explanatory power regarding the *Man* independent variables. Additionally, cases involving danger to friendly forces were chosen to highlight *Mission* independent variables. As discussed previously, *Machine* independent variables failed to demonstrate any significant changes in psychological response and thus none were specifically chosen for detailed examination.

Cases #1 and #2 both examine Pipeline aircrew and their varying response to killing for the first time in combat via RPA. Case #3 also examines aircrew first-kill psychological response, but uses a prior manned-aircraft pilot as the subject. Cases #4 and #5 introduce *Mission* independent variables of friendly forces under extreme danger while varying the *Man* independent variable. Case #4 presents a Pipeline sensor operator while Case #5 examines a prior manned-aircraft pilot.

Case #1: Pipeline Aircrew first-strike response

Taking someone's life makes a new reality of your job
- Case #1 Interview Subject

Case #1 provides an in-depth examination of a Pipeline RPA aircrew who has employed weapons and killed in combat while experiencing no disruptive or unresolved psychological responses.

Background

The subject for Case #1 is a Pipeline RPA pilot with no aviation experience prior to RPA and no combat deployments or combat experience before joining the RPA community. This subject has five total years of RPA experience and three total combat engagements spread across the five years. None of Subject #1's combat engagements resulted in near or actual collateral damage or unintended casualties. Subject #1 reported no video-game playing in the ninety days preceding the interview. See table 8.1 below.

	Independent Variables					
	Background	Prior Combat Deployment?	Friendly Forces Threatened?	Near/Acutal Collateral damage from strike?	Near/Actual Unintended casualties from strike?	Result
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response

Table 8.1 Subject #1 Independent Variable Comparisons

Combat Engagements

Subject #1's first RPA combat engagement stemmed from a friendly ground-force patrol under enemy fire. Subject #1 provided armed over-watch of the friendly forces, scanning their patrol area and providing information on the environment and possible enemy activity. As the firefight erupted between enemy and friendly forces, Subject #1's mission focus shifted from armed over-watch to strike support. Subject #1 used his RPA sensors to find three enemy engaging friendly forces and received direction to engage from the joint terminal attack controller (JTAC).[1] Subject #1 employed a single weapon, killing the three enemy. Thereafter, the firefight subsided and the friendly forces were able to continue their mission. Subject #1 kept his RPA overhead the friendly forces, providing bomb-damage assessment (BDA) of the enemy and further scanning for new threats. Later in the same mission, the friendly forces again came under enemy fire. During this second firefight, the ground forces requested additional fighter aircraft support. Subject #1 provided the fighter aircraft with assistance to find the target area and the enemy. Once they acquired the target area, the fighter aircraft executed several attacks against enemy personnel while Subject #1 used his RPA to provide over-watch and BDA for the ground forces. Although the two strikes themselves took only a

[1] The term 'his' is used generically throughout this work and does not refer specifically to a male or female RPA pilot in order to better protect the anonymity of interview subjects.

few minutes to coordinate and execute, the overall mission lasted over four hours in support of the ground forces.

Subject #1's second RPA combat engagement was also in support of friendly forces receiving effective enemy fire. In the second engagement, Subject #1 was executing an intelligence, surveillance, and reconnaissance (ISR) tasking, but was dynamically re-tasked to assist in finding a group of enemy forces attacking a friendly forward operating base (FOB). Using his RPA sensors, Subject #1 was able to find three enemy personnel firing weapons at the friendly FOB within a few minutes of tasking. Upon approval of the ground forces, Subject #1 engaged the enemy with a single weapon, killing three enemy personnel. Thereafter, Subject #1 kept his RPA overhead to provide BDA and additional threat scans for the friendly FOB. Once the threat had passed, Subject #1 returned his RPA to the original ISR mission.

Subject #1's third RPA combat engagement was against three enemy personnel with weapons moving into firing positions against friendly forces. Upon receiving direction from the ground forces, Subject #1 tracked and engaged the enemy, but killed only one of the three individuals. The remaining two enemy escaped and Subject #1 was unable to reacquire them.

Notable features of Subject #1's combat engagements include the lack of any collateral damage or unintended casualties on any of the three engagements. During the interview session, Subject #1 stated he felt the strikes were conducted according to the applicable Rules of Engagement (ROE) and Special Instructions (SPINS). Additionally, Subject #1 did not recall any further missions where he came close to employing weapons, but ultimately did not employ, that still linger in his memory. Finally, when Subject #1 was asked his opinion regarding who retained ultimate authority to employ weapons, he stated, “The pilot in command, it’s my airplane.”

Psychological Responses

During each of the engagements, Subject #1 exhibited pre-strike jitters as described in chapter four, including varying levels nervousness, elevated heart rate, elevated respiration, and sweating. Following the engagements, Subject #1 stated it was often “difficult to decompress.” Subject #1 further detailed the psychological response to his first kill below.

> I never had any issues with what I did…I recognized I crossed a line [with killing]…Those individuals were engaged in hostilities and they needed to be shot at…I take no pain and no pride in what we do.

Subject #1 clearly recognized that he had taken human life during his RPA missions. However, beyond an inability to decompress immediately after taking the shots, Subject #1 did not recall any significant psychological reactions to killing across the emotional domain, including any disruptive emotions. During the emotional domain questioning, Subject #1 also wanted to note the actions of some of the young intelligence personnel in his squadron who were not directly responsible for the kills.

> Our young intelligence guys, we had to tell them to calm down their happiness and excitement [with the killing]…There are real people on the end of these strikes…We had some people in our operations cell that were not acting appropriately [during engagements] and needed to be dealt with.

Socially, Subject #1 did not recognize any changes to his environment following the weapon engagements. Furthermore, Subject #1 did not recall family or friends recognizing any social changes in him around the time of the weapons engagements.

Cognitively, Subject #1 claimed a high sense of mission accomplishment following the strikes, stating, "[Striking] was the emphasis of the training program and it's good to execute what you've trained to do." Subject #1 further noted having a "Different feeling of confidence and experience [after striking]." Furthermore, Subject #1 stated he did not view those who have employed weapons in a different manner after striking himself.

Subject #1 claims he is mentally engaged in combat despite the distance involved in his work, stating, ""When I walk into the compound at work, I'm there, I am mentally in [the country], I'm there mentally."[2] Additionally, Subject #1 stated he knows the targets on his cockpit video screen are real and not a computer game, stating, "I know because I see the human interaction…You know those are real people on the screen."

[2] The actual country subject #1 mentioned is omitted from this quote for security reasons.

Results & Impressions

The theories presented in chapter three regarding the physical and technological distance between Subject #1 and his targets would suggest the lack of psychological reaction can likely be explained by shooting missiles from the United States on a video screen against targets thousands of miles away. However, if this explanation held true, Subject #1 should also not have exhibited such a high level of thoughtfulness and seriousness of his actions against enemy personnel. During the interview, Subject #1 repeatedly spoke of "Being there" and "[Knowing] those are real people on the screen." If Subject #1 was fully removed from the reality of killing via physical and technological distancing, we should also expect him to exhibit a level of mental disengagement regarding the realities of his day-to-day flight operations. Instead, Subject #1 indicated he was fully aware of the reality of his actions despite his lack of psychological response, further stating, "I had been thinking about it [taking a life]…This is U.S. policy and these are valid targets."

Moreover, Subject #1's comments regarding the young intelligence personnel in his squadron and their attitude towards killing provide an interesting insight into his personal views on the seriousness of killing and serve to highlight a possible mental chasm between RPA aircrew and their supporting intelligence personnel. Subject #1 clearly viewed killing via RPA as a serious action and became agitated when other personnel in his squadron did not display the same sense of gravity in taking of human life.

The young intelligence personnel discussed by Subject #1 also provide a worthy issue for consideration based upon their relative positioning in the hierarchy of killing from several thousands of miles away. RPA intelligence personnel provide mission support to MQ-1/9 aircrew from an operations center that is physically separated from the RPA cockpit. They share no direct responsibility for the employment of weapons by either approving a strike or actually employing and guiding the weapons to their target. They do, however, receive a real-time video feed of the RPA camera and watch the strike occur on a television screen that is typically two to four times larger than the screens in the RPA cockpit. In many ways, intelligence personnel possess a front-row seat to the death and destruction wielded by modern weapons without any of the accompanying responsibility for actually pulling the trigger. Whether this front-row seat devoid of responsibility results in a greater or lesser psychological response to killing is largely unknown and quite possibly worthy of further investigation. Anecdotal evidence collected during this study indicated both an excitement for killing and significantly increased negative psychological responses to killing for several intelligence personnel in the squadrons interviewed.

More interesting, however, is the change in psychological response that may be present between the aircrew responsible for killing and the intelligence personnel charged with mission support. Subject #1's unhappiness with the attitude of some of his intelligence personnel carries a very specific message.

> *You don't realize how serious this killing is because you are simply watching it on the screen while I'm the one responsible for this person's death.*

If this concept of *responsibility* is expanded beyond an RPA squadron, Subject #1 is claiming those who have not killed and carried such a heavy burden are not qualified to comment or outwardly express emotions regarding the process. In Subject #1's opinion, killing may actually have become a game, or bloodthirsty sport, to his intelligence personnel. When one simply views the killing on a screen without carrying the personal burden of taking human life, this concept becomes a plausible explanation.

Perhaps this also helps explain why several authors previously cited view killing via RPA as a game as well. For the first time in the history of warfare, civilians in society are provided up-close, full-motion movies of killing in warfare. To those unburdened from the responsibility, these images of modern warfare appear game-like, surreal, and possibly even sporting. But to Subject #1, who views the same movie knowing the responsibility for the death hangs on his conscience, no amount of physical or technological distancing can erase the full reality of his actions.[3]

[3] Consider for a moment an additional example of military personnel charged with nuclear missile duty in silos across North America. Their job carries a responsibility that envelops millions of people, the future of nations, and possibly the future of planet Earth. We may attempt to place ourselves in their shoes, empathize with them personally, and thereafter critique or praise their work. But unless people have truly carried this enormous weight themselves, they cannot truly know what it feels like to serve in this job or hold this amount of responsibility in their own hands.

Case #2: Pipeline Aircrew first-strike response

After my first strike, I was in a bad place mentally
- Case #2 Interview Subject

Case #2 provides an in-depth examination of a Pipeline RPA sensor operator who has employed weapons and killed in combat and thereafter experienced a significant psychological response.

Background

The subject for Case #2 is a Pipeline RPA sensor operator with no aviation experience prior to RPA and no combat deployments or combat experience before joining the RPA community. Subject #2 has approximately one and a half years of RPA experience and two total combat engagements. Subject #2's combat engagements did not result in any collateral damage or unintended casualties. Subject #2 reported no video-game playing in the ninety days preceding the interview. See table 8.2 below.

	Independent Variables					
	Background	Prior Combat Deployment?	Friendly Forces Threatened?	Near/Acutal Collateral damage from strike?	Near/Actual Unintended casualties from strike?	Result
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response
Subject #2	Pipeline Sensor Operator	No	No	No	No	Negative Disruptive Emotional, Social, & Cognitive Response

Table 8.2 Subject #2 Independent Variable Comparisons

Combat Engagements

Subject #2 has two total combat engagements with two total enemy kills, killing one in each of the two engagements. In the subject's own description, both the strikes were 'standard' with 'no complications' and flown in support of the ground forces who requested the air support for their operations. During both the engagements, Subject #2 tracked the target for only several minutes prior to weapons employment.[4] Notable features of Subject #2's combat engagements include the lack of any collateral damage or unintended casualties.

Psychological Responses

During each of the engagements, Subject #2 exhibited pre-strike jitters that included varying levels of nervousness, elevated heart rate, elevated respiration, and sweating. Subject #2 details his immediate response to the first strike below.

> We kill him…that's the first time I saw someone dead and we zoom in to view the dead body and get BDA [bomb damage assessment]. Right then, it hit me. My heart just started pumping.

Although the subject noted pre-strike jitters and an extreme reaction to seeing the dead body, his strong psychological reaction developed slowly.

[4] Further details of Subject #2's strikes must be withheld for security reasons

> I went home that night and couldn't talk with my wife. She knew something was wrong. I couldn't get that image of his [dead] body out of my mind. Then about four days later I started thinking about a kid growing up without his father that I had killed. The humane thing is to let him live, but this guy was trying to kill Americans. Finally, about two weeks later I broke down. I couldn't hold it in anymore and I had to seek help…I wanted to know if God was OK with what I was doing.

When Subject #2 was asked why he did not seek help sooner even though it appeared he was struggling psychologically with killing soon after the event, he stated, "I couldn't seek help because I felt like I was letting my squadron down." Subject #2 spoke passionately about the manning issues and operations tempo in his squadron and his desire to remain a contributing member of his squadron because he knew others would have to cover for him if he sought help and was removed from flight duties. Instead, Subject #2 tried to deal with things privately, resulting in both a negative and disruptive emotional response to his first combat engagement.

Cognitively, Subject #2 experienced a negative and disruptive result following the first strike with a strong desire to avoid future weapon strikes. Subject #2 also stated he approached RPA operations differently after the first engagement, choosing to focus on the mental aspects of his job and the preparation in a more deliberate manner than before the first strike. Furthermore, Subject #2 stated he did not view personnel in his squadron any differently depending on whether they had employed weapons.

Socially, Subject #2 distanced himself from family, friends, and co-workers following the strike, resulting in a long-term disruptive social response. Additionally, Subject #2's spouse immediately noticed a negative change in his demeanor following the first strike.

After Subject #2 received professional help, he recovered psychologically and was cleared to return to flight duties. Commenting on this process, Subject #2 stated, "I was in a bad place mentally after the first strike, but I am much better now." Subject #2 had another strike with one kill after returning to flight duties and he reported no significant psychological reaction to killing during this second engagement.

Subject #2 stated he felt mentally connected to his work despite the physical and technological distance, stating, "I'm still immersed in it." Subject #2 also stated he knew his job was real instead of a video game, stating, "It's just real. I know it's real."

Results & Impressions

Consideration of the existing independent variables fails to yield a clear explanation for Subject #2's strong psychological response to his first kill. Simplistic application of the theories presented in chapter three suggest Subject #2 should not have experienced any psychological response to killing from thousands of miles away. Searching for heuristic identification of new independent variables within Case #2 yields three elements for consideration.

First, Subject #2 was less than twenty-one years old when he experienced his first kill, one of the youngest in the entire study. As discussed previously in chapter four, this study intended to investigate subject age at the time of weapons employment as an independent variable for analysis, but logistical hurdles prevented the collection of comprehensive data on this variable for every reported strike. An untested hypothesis regarding age at time of killing would prospect that younger people experience a higher rate of psychological distress than older, more mature, personnel. If true, the manifestation of psychological issues seen in Subject #2 may have largely been driven by his relatively young age at time of weapons employment.

Second, Subject #2 may have been predisposed to experiencing a psychological impact to killing due to harboring personal issues that weakened his mental resiliency. While this is plausible, we are unable to draw correlation between psychological issues and a predisposed mental state due to lack of comprehensive medical history on every subject interviewed.

Third, the lack of decompression time provided to Subject #2 after his first strike may have played a role in his resulting psychological response. During the interview, Subject #2 stated he did not go to the squadron bar or socialize in any other way with his squadron members following the mission debrief. Subject #2's experience is common, as only 12 percent of his fellow squadron members reported socializing with fellow aviators following a strike and only 24 percent of the overall study population reported doing so. Subject #2 was thrust back into civilian life within hours of killing another person without the benefit of decompression and group socializing normally associated with other members of the armed forces. Back at home, sitting next to a spouse who has no mental foundation to understand what has transpired and without the proper security clearances to discuss any detail of the killing, Subject #2 found himself mentally isolated. Despite struggling with the act of killing, he made the seemingly logical choice to deal with his issues privately because seeking professional medical help would have likely led to his disqualification from flight duties, at least temporarily.

Had Subject #2 been encouraged or required to attend a social event immediately following the kill, his squadron members may have been able to help him rationalize and work through the emotions of killing before it grew into a larger issue. At a minimum, his fellow squadron members may have recognized Subject #2's significant psychological response to killing and intervened to get him professional help, saving him from suffering in silence for almost two weeks after the event before finally breaking down. Once again, it appears leadership engagement with the aircrew may play a critical role in preparing them for the kill and supporting them afterward. A properly trained supervisor should have recognized Subject #2's issues before he was sent home following the strike.

Returning to the central question for this study, Subject #2's reaction to killing and subsequent interview commentary provide convincing evidence that he felt directly involved in the killing of another human being despite the distance involved. Subject #2's initial reaction, his additional thoughts of a child growing up without a father that he killed, and wanting to know if God was OK with his actions all vividly point to someone fully aware of his actions. Death was displayed on a television screen without the sounds, smells, and physical interaction of traditional close-combat, but it was still real for this aviator.

Case #3: Manned aircraft cross-flow first-strike response

> The gravity of killing someone made my personal life trivial.
> - Case #3 Interview Subject

Case #3 provides an in-depth examination of an RPA pilot with prior manned-aircraft experience who employed weapons and killed in combat and thereafter experienced a disruptive psychological response.

Background

The subject for case #3 is an RPA pilot with prior mobility/reconnaissance aircraft experience and several combat deployments, including a ground-combat tour to Iraq.[5] Subject #3 has four and one half years of RPA experience and one combat engagement. He reported no video-game playing in the ninety days preceding the interview. See table 8.3 below.

[5] The actual aircraft type is omitted to help protect the identity of the interview subject.

	Independent Variables					
	Background	Prior Combat Deployment?	Friendly Forces Threatened?	Near/Acutal Collateral damage from strike?	Near/Actual Unintended casualties from strike?	Result
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response
Subject #2	Pipeline Sensor Operator	No	No	No	No	Negative Disruptive Emotional, Social, & Cognitive Response
Subject #3	Prior Mobility/Recce Pilot	Yes	No	No	No	Negative Emotions; Disruptive Social Response

Table 8.3. Subject #3 Independent Variable Comparisons

Combat Engagements

Subject #3 has one combat engagement with one enemy kill. He describes his combat engagement below.

> I had just settled into my intelligence-gathering mission, waiting and watching…actually expecting about three hours of boredom to begin. But, with little notice, we were dynamically re-tasked to find and strike some enemy personnel [threatening friendly forces]. There were two of them…we shot and got one of them.[6] The other got away.

Subject #3's lone combat engagement did not result in any near or actual collateral damage or unintended casualties. Additionally, the combat engagement occurred as a result of dynamic re-tasking, providing the aircrew with only a few minutes of station time and target observation before the ground forces directed the strike.

[6] Similar to all other interviews, Subject #3 provided much further detail on this strike, but much of it must be omitted for security considerations.

Psychological Responses

During the engagement, Subject #3 exhibited pre-strike jitters, taking extra time to note some of the characteristics.

> I had a hard time talking and my hands were shaking. I was surprised by the amount of jitters I was experiencing. Before I shot, I had two years [experience] on the line [in combat operations]. I probably had a thousand practice shots, and now we were actually going to kill someone.

Subject #3's provides poignant commentary on his psychological state following the engagement.

> The gravity of killing made my personal life trivial. I had a similar feeling after I returned from Iraq [in a previous job]. My home issues just felt trivial. My family didn't necessarily think they were trivial, but compared to what I had just done [killing] at work…in combat…it felt trivial to me.

Regarding the actual strike, Subject #3 stated he experienced a strong psychological response to killing, much stronger than anticipated.

> It [killing] messed with my head. It took me two or three days to get over. I was surprised at how much it impacted me given my background, my deployments…I had carried human remains on my aircraft and had tactical experience in combat…but it still impacted me greatly.

While Subject #3 reported a negative emotional response to killing, it was not disruptive. Socially, however, Subject #3's negative response resulted in disruptive behavior, including distancing between himself and family members.

Subject #3 further stated his spouse recognized the social distancing immediately after the strike.

Cognitively, Subject #3 denied having a strong sense of mission accomplishment following his first strike, stating, “I’m just doing my job.” Subject #3 further elaborated on his sense of accomplishment during missions where he was not required to employ weapons.

> Raid support to friendly forces made it tough. If [friendly ground forces] had a bad day [took casualties], I found myself experiencing survivor guilt.

Subject #3 stated he did not feel psychologically prepared for his first weapons engagement; and, since the strike, he has worked to ensure other aircrew in his squadron are better prepared for their first strike. However, Subject #3 did not view other aircrew in his squadron differently depending on whether they had employed weapons in combat. Subject #3 claims to maintain a mental connection with the combat theater despite the physical distance, stating, “Surprisingly, when I get into the [cockpit], the distance goes away pretty quickly.” Subject #3 further stated he felt more connected to the ground forces in RPA than with his previous manned aircraft despite the physical distance involved in RPA operations. Finally, Subject #3 stated his work did not resemble a video game, claiming, “The [RPA] simulator is a video game. These are thinking, breathing enemy on my screen.”

Results & Impressions

Subject #3 offers three possible independent variables worth additional consideration. First, similar to Subject #2, this subject may have been predisposed to significant psychological reaction following his kill. However, unlike the previous case, Subject #3 has extensive prior combat deployment experience, providing him a mental foundation for warfare that was not resident in Subject #2's first kill. Had Subject #3 possessed a predisposition for psychological response to killing, it would have likely manifested prior to joining the RPA community.

Second, Subject #3 may have spent his mental resiliency 'capital' handling combat stress during previous deployment experiences. Thereafter, Subject #3 was at significant risk of psychological impact following a kill in the RPA community due to his reduced mental resiliency. The theory underlying this concept states that prior stress due to traumatic experiences does not subside, but rather persists and weakens a person's psychological resources, making him more vulnerable to psychological breakdown in future stressful situations.[7]

Third, Subject #3's two years of combat flight operations without shooting may have conditioned him to become mentally complacent regarding the possibility of killing in the line of duty. This conditioning, added to the

[7] Norman A. Milgram, *Stress and Coping in Time of War: Generalizations from the Israeli Experience* (New York, NY: Brunner/Mazel, 1986), 84; Also see Lord Moran, *The Anatomy of Courage* (Boston. MA: Houghton Mifflin, 1967).

rapid transition from a benign intelligence-gathering mission to striking and killing someone in a matter of minutes may have prevented Subject #3 from preparing himself mentally for the kill.

Several interview subjects mentioned the difficulty in maintaining constant tactical vigilance over thousands of hours of intelligence-gathering missions. Subject #3 further commented on this requirement.

> We can go from bored-to-death to an extremely busy tactical scenario in five minutes. In this environment, fighting complacency and always being ready for the transition is difficult. Try doing that for a 100 days in a row.

While Subject #3 is speaking of technical vigilance in the above quote, perhaps the same processes are occurring with the vigilance required to keep oneself mentally prepared to kill. Subject #3 went to work approximately five hundred times before he was finally called upon to kill. He may have been psychologically prepared to kill via RPA and thereafter allowed his mental preparation to suffer as the months dragged on without the requirement to kill actually coming to fruition.

Case #3 also exhibits an additional point of discussion that relates to the intelligence personnel from Case #1 and their viewing of strike videos. Prior to his first kill, Subject #3 had been flying combat operations for over two years in a squadron that employed weapons on a regular basis. Subject #3 viewed a significant quantity of strike videos in the two years prior to his employment, including the resulting BDA and pictures of dead bodies. It would seem, however, these images did not desensitize Subject #3 to the reality of killing via RPA when he finally became personally responsible for the death of another human being. This example provides further argument that the experience of viewing death and killing falls far short of actually performing the act and carrying the psychological burden. Furthermore, given the large numbers of strike videos available for viewing by all combat RPA aircrew, if simply viewing strike video provides inoculation against significant psychological response then this study should have recorded almost no disruptive or negative emotional reaction to killing. Instead, it appears that viewing a kill on a video screen is simply not the same mental experience as viewing a kill when one is responsible, even at the vast distances employed by RPA.

Finally, Subject #3 provides an interesting commentary on his transition between civilian and military life when comparing his return home after a day of flying RPAs to his return from a combat deployment to Iraq. Subject #3 stated the gravity of killing someone made his personal life feel trivial, creating social isolation when he returned home and faced family issues just hours after killing someone in combat. Subject #3's commentary on the forced transition between military and civilian life resonates with Wells' inquiry regarding the psychology of World War II bomber crews who routinely transitioned between the harrowing experiences of air combat over Europe and the relative calm of the English countryside.[8] While RPA aircrew lack the risk profile experienced

[8] Mark Kendall Wells, "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992, 122.

by World War II bomber crews, they nonetheless experience a stark transition between killing in combat and the vagaries of civilian life on an almost regular basis. Also, unlike aviators who deploy to their combat zone for extended periods of time or American bomber crews deployed to England during World War II, RPA aircrew are forced to transition between combat and family life several times per week without the normal decompression time afforded by the days to weeks normally associated with a transit home.

Case #4: Pipeline response to Mission Specific Variables

> When I recovered [mentally] from my strike, I wanted to strike more simply to prevent others from having to experience what I went through.
>
> - Case #4 Interview Subject

Case #4 provides an in-depth examination of a Pipeline RPA sensor operator who employed weapons during a mission with significant risk to friendly forces and thereafter experienced a significant psychological response.

Background

The subject for Case #4 is a Pipeline RPA sensor operator with no prior combat deployments or manned aircraft experience. Subject #4 has approximately four years of RPA experience and averaged five hours of video-game play per week over the last three months including first-person shooter games. See table 8.4 below

	Independent Variables					
	Background	**Prior Combat Deployment?**	**Friendly Forces Threatened?**	**Near/Acutal Collateral damage from strike?**	**Near/Actual Unintended casualties from strike?**	**Result**
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response
Subject #2	Pipeline Sensor Operator	No	No	No	No	Negative Disruptive Emotional, Social, & Cognitive Response
Subject #3	Prior Mobility/Recce Pilot	Yes	No	No	No	Negative Emotions; Disruptive Social Response
Subject #4	Pipeline Sensor Operator	No	Yes	No	No	Negative Disruptive Emotional & Social Response

Table 8.4. Subject #4 Independent Variable Comparisons

Combat Engagements

Subject #4 has over a half-dozen combat engagements. The engagement for analysis was a strike in support of friendly ground forces under enemy fire and taking casualties, described by Subject #4 below.

> We were pushed to this new mission with little notice. Everything was happening fast. As we checked on station [via radio], the JTAC [air controller] was extremely amped up. They [friendlies] were taking fire from enemy in a nearby treeline and had already taken two casualties. The JTAC wanted a weapon immediately…he needed to get the enemy fire subsided so he could bring in the MEDEVAC [medical evacuation] helicopters for the wounded.
>
> It happened so fast, the actual weapon employment was like a training run…no time to really even think about it. The pilot was very busy talking with the JTAC and I tracked the target…we [the pilot and I] hardly talked to each other…the training just kicked in. We struck and the JTAC told us he estimated we killed ten enemy…the friendlies stopped taking fire and they were able to extract the wounded.

Psychological Responses

During his engagements, Subject #4 exhibited the pre-strike jitters described in chapter four that included varying levels nervousness, elevated heart rate, elevated respiration, and sweating. Following the mission-specific engagement presented above, Subject #4 details his psychological response.

> Afterward [once out of the cockpit], everything hit me. I was shaking and had kind of a panic attack…I don't know what else to call it. I avoided everyone else in my squadron…I went into an empty room, made it dark, and tried to calm myself down. After a while, and after I was sure everyone else had left the building, I thought I had calmed myself down enough to drive home. I started driving, but I had to pull over on the way home…I still couldn't even drive my car. It [my mental state] was a combination of killing dudes and getting those friendly forces back to their base…we did a lot of s*** that day.
>
> Looking back now, I was distressed immediately after that strike. But now, afterward, I'm more reflective. It's definitely not joy. Blowing things up with weapons is cool, but not killing people.
>
> When I recovered [mentally] from my strike, I wanted to strike more simply to prevent others from having to experience what I went through.

Subject #4's significant emotional response was short in duration and completely resolved, allowing him to continue flight operations and conduct additional strikes. Subject #4 never sought professional help for the issues described above. Cognitively, Subject #4 felt a sense of mission accomplishment from the strike and was outwardly focused towards his squadron's success.

> I don't view [mission accomplishment] so personal. It was the mission for the squadron. I took pride in the squadron…we are all in it together and it takes the entire team. You win because the squadron wins.

Subject #4 also stated that he approached RPA operations differently following this weapon engagement: "Employing weapons grounded me." Immediately after the strike, Subject #4 also viewed personnel in the squadron differently based on whether they had employed weapons, stating, "People who struck were a known quantity." However, Subject #4 stated he became less biased in this regard as he gained more experience.

Socially, Subject #4 also experienced a disruptive response to killing, changing his attitude towards family members and developing a condescending demeanor.

> Initially, I thought I was different. I thought, 'I'm a killer now.' It turns out you aren't different. You just need to go on and live your life.

Subject #4 also stated that his family noticed the social changes and eventually confronted him on the subject because they had become concerned with his new attitude.

Results & Impressions

Searching for heuristic identification of new variables within Case #4 yields five factors for consideration, four of which have been previously discussed within the first three case studies. First, similar to Subject #2, this sensor operator was young, less than twenty-five years old during this weapons engagement. As described earlier, age may be a significant contributor to psychological response in RPA aircrew.

Second, Subject #4 may have been predisposed to experiencing a psychological impact to killing due to harboring personal issues that weakened his mental resiliency. This factor was also previously discussed for Subject #2 and will be examined further in the discussion section of chapter eight.

Third, Subject #4 was thrust into his civilian life shortly after the weapons engagement with no squadron socializing or bonding time, mimicking similar experiences from Subjects #2 and #3. Subject #4 spent his workday killing enemy personnel, and his actions directly resulted in saving the lives of American soldiers on the ground, yet the extent of his decompression was an informal 'Nice job, see you tomorrow' from fellow squadron members.

Fourth, Subject #4 also had a rapid transition from a relatively benign intelligence-gathering mission to supporting friendly forces in grave danger in a matter of minutes. Perhaps, as was discussed with Subject #3, the rapid transition between benign intelligence-gathering and employing weapons is an independent variable worthy of future investigation.

Fifth, Case #4 is the first one examined where the subject was presented with a friendly voice on the radio, but under extreme duress and requiring immediate RPA support to engage enemy forces. Previous analysis presented in chapter five demonstrated statistically significant differences between first-strike negative emotional responses and the emotional responses that occurred while friendly forces were in danger. Case #5 presents such an example in additional detail.

Although friendly-force danger was likely not the sole cause of his psychological response, Subject #4 definitely attributed some of his emotional aftermath to the danger encountering friendly forces and his role in ensuring their safe return to the base. Radio communication provided Subject #4 a gateway to an American voice filled with emotion, requesting his assistance, and stressing the importance of finding the enemy while gunfire could be heard in the background.

Finally, a thought-provoking sidebar regarding Subject #4 is the decision to hide from fellow aviators immediately following the strike, not wanting them to witness his so-called panic attack and overall psychological state. Similar to Subject #2, had this subject been required to attend traditional aviator wartime practices of socializing and bonding after a tough or successful mission, Subject #4's psychological state would have likely been noticed by his fellow aviators. Perhaps the support network of fellow aviators and front-line supervisors could have settled Subject #4's psyche, and if not, then professional help could have been sought. Instead, similar to Subject #2, this one was quickly forced to make the transition back to civilian life, dealing with psychological issues on his own, ultimately leading to his inability to perform simple tasks such as driving an automobile. Once again, had squadron leadership been directly involved in the preparation and post-strike support to this subject, he would not have attempted to drive home while under mental duress.

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

Case #5: Prior Fighter/Bomber Pilot Response to Mission-Specific Variables

> I don't need to employ weapons to feel good about my job. Some of my best days occurred when we helped the friendly ground forces and didn't need to employ.
> - Case #5 Interview Subject

Case #5 provides an in-depth examination of an RPA pilot with prior fighter/bomber aircraft experience who experienced a significant psychological response to a mission supporting friendly forces in danger.

Background

The subject for Case #5 is a prior fighter/bomber pilot who transitioned to RPAs three years ago.[9] During his previous fighter/bomber experience, Subject #5 had a combat deployment where he employed weapons multiple times against enemy personnel. Subject #5 did not report any video-game playing in the ninety days preceding the interview. See table 8.5 below.

[9] The actual aircraft type is omitted to help protect the identity of the interview subject.

	Background	Prior Combat Deployment?	Friendly Forces Threatened?	Near/Acutal Collateral damage from strike?	Near/Actual Unintended casualties from strike?	Result
	Independent Variables					
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response
Subject #2	Pipeline Sensor Operator	No	No	No	No	Negative Disruptive Emotional, Social, & Cognitive Response
Subject #3	Prior Mobility/Recce Pilot	Yes	No	No	No	Negative Emotions; Disruptive Social Response
Subject #4	Pipeline Sensor Operator	No	Yes	No	No	Negative Disruptive Emotional & Social Response
Subject #5	Prior Fighter/Bomber Pilot	Yes	Yes	No	No	Negative Unresolved, Non-Disruptive Emotional Response

Table 8.5. Subject #5 Independent Variable Comparisons

Combat Engagements

Subject #5 has eleven total RPA weapon employments with no significant psychological responses across the emotional, cognitive, or social domains for his first strike. Subject #5's increased psychological reaction occurred on a mission where his RPA did not employ weapons and is described below with accompanying psychological response.

> The one I really remember is a TIC [friendly Troops In Contact with enemy] we were called to support in the summer of 2012. We had friendlies taking effective fire before I arrived on station and they had already taken casualties. The JTAC [air controller] wanted us to find the enemy sniper who was engaging the friendlies. It was stressful…there was already an Apache [helicopter] on station just shooting into an empty field trying to get the enemy to put their heads down so our guys could break contact. [Nobody knew exactly where this sniper was hiding]

> While we were searching for the sniper, he shot and killed one of our guys. When I checked onto that TIC, that guy was alive. I couldn't find the sniper engaging [friendlies], and now the friendly is dead…[interviewee becomes emotional]…that's a tough thing. The friendlies were finally able to egress the area and call for MEDEVAC [medical evacuation helicopter]. I felt like we were of no help.

Psychological Responses

During his previous eleven weapon engagements, Subject #5's psychological responses were unremarkable across the social, emotional, and cognitive domains. In general, his emotional responses leaned positive, but similar to many other interviewees, they were largely driven by the outcome of the strike and the mission impact versus the actual act of killing enemy personnel.

In the case example, Subject #5 was overcome by emotion when describing the death of friendly forces while his RPA circled overhead. An American soldier, one this pilot never met, never talked with on the radio, and who was never more than a few pixels on a screen in his stateside cockpit still had the capacity to bring this RPA pilot to tears when telling the story over two years later. Explaining how RPA pilots can develop this level of mental connection through a video screen following an action occurring thousands of miles away with people they have never met may prove a daunting task. Categorically, Subject #5 displayed long-term negative emotions from this event, but these emotions have not caused a disruption in his work or personal life.

Results & Impressions

Subject #5 is a complex case to dissect. A pilot with weapons employments in his prior manned aircraft and eleven total weapon engagements in the RPA community denying significant psychological reaction to any of them, yet he experienced a significant psychological reaction to a mission where he ultimately did not employ weapons and kill enemy personnel. The scenario for Case #5 was far from the only mission where friendly forces were in danger with Subject #5 supporting them. In fact, Subject #5 stated that nearly all of his eleven weapon engagements occurred with friendly forces actively engaged in a firefight or directly threatened by enemy personnel.

Subject #5 also stated that some of his college friends were then deployed overseas, providing a possible avenue for increased mental connection to those serving in ground-combat roles. But Subject #5 was far from the only subject to state he had family or friends currently serving in a combat zone. Another aircrew even told a story about talking to his brother on the radio while they were both piloting aircraft over Afghanistan. Instead, two additional factors merit further consideration.

1) During this particular strike, Subject #5 did not materially contribute to the success of this mission and felt he failed to support the ground personnel.
2) Friendly personnel died while Subject #5's RPA was supporting this mission.

While Subject #5 felt like a failure during this mission, his feelings would have likely been much different had the friendly forces not taken casualties during the time he was searching for the sniper. The risk in addressing Subject #5's feeling of failure on this mission involves inductively reasoning lack of mission support as a casual factor in emotional response when friendly death likely played a greater role in driving his emotional outcome. A more logical argument would be that any friendly death occurring while aircrew are supporting from overhead may result in significant emotional response, regardless of how much or how little the aviators feel they have contributed to the mission. In this sense, any feelings of failure likely become a logical sequel to the feelings derived from experiencing friendly death and thus are inadequate to fully explain the aircrew's psychological response.

Directly addressing the second statement from above and re-analyzing missions with threats to friendly forces and focusing on casualties or death yields some surprising findings. Out of the six RPA aircrew that reported significantly negative emotional responses to friendly-forces-in-danger situations, five of them experienced a friendly-forces death or casualty during the mission (four deaths and one casualty).[10] Only a single mission occurred where RPA aircrew reported a significant psychological response to friendly-

[10] The author was able to review interview transcripts and build this data despite the lack of focus on friendly casualty and death as an independent variable for analysis. However, the data set gathered herein on friendly force casualties and death is so small compared to the total number of engagements and psychological responses, significant statistical conclusions cannot be drawn.

forces danger without friendlies also reporting casualties or death during the engagement. This sole outlier was also unique as the missile fired from the subject's RPA malfunctioned. Instead of killing enemy, the missile nearly impacted friendly forces, resulting in significant emotional stress for the subject interviewed.

Finally, Subject #5 presents a compelling rationale for the qualitative approach to augment the statistical analysis presented in earlier chapters. Subject #5 clearly views his role in warfare, RPAs, and killing as real and tangible. However, his categorical responses to killing across first strike and ten additional weapon employments were rather unremarkable; slightly positive cognitive and emotional responses and no response in the social domain. Taken in isolation, these statistical responses hardly painted a picture of an RPA pilot mentally impacted by the reality of his work. But thereafter, given an opportunity to discuss anything on his mind, Subject #5 provided a detail-rich account of his significant emotional response to a mission in which he never employed weapons that provides strong evidence regarding his mental connection to flying RPAs in combat. Without an open-ended interview format to capture Subject #5's most significant event, a full understanding of his psychological response to killing, and RPA operations in general, may have never been developed.

Discussion

This chapter examined five examples of RPA aircrew engaged in combat operations with variations across *Man* and *Mission* independent variables juxtaposed against differing psychological responses. Table 8.6 below summarizes the cases. The objective of this approach was to qualitatively examine the psychological responses to killing in MQ-1/9 aircrew and heuristically identify additional variables that may be impacting these responses. In subsequent chapters, we will combine these qualitative descriptions with the previous statistical analysis to focus on the central research question: "How does killing from a distance psychologically influence RPA aircrew?"

	Independent Variables					
	Background	**Prior Combat Deployment?**	**Friendly Forces Threatened?**	**Near/Acutal Collateral damage from strike?**	**Near/Actual Unintended casualties from strike?**	**Result**
Subject #1	Pipeline Pilot	No	Yes	No	No	Negative & Positive Emotional Response; Positive Cognitive Response
Subject #2	Pipeline Sensor Operator	No	No	No	No	Negative Disruptive Emotional, Social, & Cognitive Response
Subject #3	Prior Mobility/Recce Pilot	Yes	No	No	No	Negative Emotions; Disruptive Social Response
Subject #4	Pipeline Sensor Operator	No	Yes	No	No	Negative Disruptive Emotional & Social Response
Subject #5	Prior Fighter/Bomber Pilot	Yes	Yes	No	No	Negative Unresolved, Non-Disruptive Emotional Response

Table 8.6. Independent Variable Comparisons Summary

Case #1 presented a Pipeline RPA pilot who experienced minor negative and positive emotional reactions to his first kill, but did not experience any disruptive emotional, social, or cognitive responses. Case #2 was presented as a counter-point to Case #1, where similar conditions and independent variables yielded a much different, and more pronounced, psychological reaction. Case #3 examined another aircrew experiencing significant negative psychological response to killing, focusing specifically on a pilot with prior manned-aircraft experience and combat deployments. Finally, Cases #4 and #5 both presented aircrew experiencing significant psychological responses to *Mission* specific variables with varying aircrew background.

Independent Variables

Case analysis uncovered six additional *Man* and *Mission* variables for discussion that were not focus areas within the original research project.

1. **Subject Age** (*Man* Independent Variable). Two of the subjects presented in this chapter, Subject #2 and Subject #4, were in the youngest age group recorded for this study (18-25 years old) at the time of their first weapons engagement. As previously discussed, collecting age information for every subject *at the time of every engagement* proved an insurmountable logistical task given the large amount of data required and the desire to keep interviews under an hour total time. It appears, however, the original proposal to include subject age as a focus area within *Man* Independent variables may have yielded valuable statistical data on how different age groups have responded to killing via RPA.

Based on the case data and related discussion, we can induce that younger aircrew will display a higher proportion of psychological impacts after killing via RPA, but we currently lack the statistical analysis to support this conclusion.

2. **Subject Predisposition** (*Man* Independent variable). All subjects who reported significant psychological response may have been predisposed to this response based upon their personal life or previous military experiences. Any predisposition to psychological response would likely not have been identified by the primary interviewer due to lack of medical training in the field of psychology. However, RPA aircrew are screened in the same manner as other USAF aircrew during the accessions process and at regular intervals throughout their career, providing several opportunities for trained medical professionals to detect any underlying issues prior to the first weapons engagement.

3. **Decompression Time** (*Mission* Independent variable). Subjects #2, #3, and #4 were notable for their lack of decompression time following their strike missions. Unlike traditional combat personnel who deploy with brothers-in-arms for months at a time and are faced with a days-to-weeks-long journey home after combat, RPA aviators make the transition to civilian life dozens of times a month.[11] Moreover, during the interview

[11] In 2011, the average transit time for an American serving in Afghanistan to return home was approximately seven days. (Source: Author)

process, it was evident that killing in combat or involvement in highly stressful missions rarely warranted any of the squadron aviators remaining after work to socialize or informally debrief with each other. When queried on whether squadron members socialized after work, especially after shooting, 76 percent of participants remarked 'no' for two main reasons.

a. *Schedule and Operations Tempo.* Employing weapons requires a full debrief and significant paperwork for an 'After Action Report.' These requirements routinely push the subject's duty day to the twelve hour aircrew limit preceding the next day's mission. Many subjects stated they lacked motivation to socialize with other squadron members when they were personally fatigued from a long day and the operations tempo demanded their return to work in approximately twelve hours.

b. *Family Pressures.* The nature of deployed-in-garrison shift work places significant requirements on RPA aviators to return home at the earliest opportunity and spend time with family, especially children, pre-empting the ability to socialize with squadron members outside work. The 24-hour RPA workday is typically broken into three shifts; Days, Swings, and Midnights. If aviators remain at work to socialize after Day shift, their children may be asleep before they arrive home. If they remain late after Midnight

> shift, their children will likely be at school before the aviators arrive home. Following swing shift, which ends around 11:00 pm for most squadrons, RPA aviators do not have the immediate pull of family life preempting their socialization time, but the prospect of staying out late while still being required to wake at 7:00 am to see one's family and help get the kids ready for school prevents many aviators from wanting to forgo an already limited ability to sleep prior to the next day's family commitments. Overall, there is not a current shift schedule in the RPA community that accommodates both an opportunity to socialize and bond with peers outside work, and meet the daily requirements of being a husband/wife and father/mother.

Additionally, while several aircrew at Creech Air Force Base (AFB) stated it was mandatory for them to speak with the operational psychologist after they had employed weapons in combat, all agreed the process was haphazard at best, mostly done over the phone days or even weeks after the event, if at all. The aircrew impressions of this process are not surprising, given that Creech AFB has a single operational psychologist charged with supporting over a half dozen squadrons flying round-the-clock combat operations 365 days per year. According to the aircrew interviewed, the current operations tempo prevents them from taking any time to speak with an operational psychologist following weapons employments because they are needed to fill the next day's schedule, regardless of whether they have employed in combat or not.

4. **Mental Complacency** (*Mission* Independent variable). Extended time between kills, coupled with rapid transitions from benign intelligence-gathering missions to stressful combat strikes, could contribute to a lack of mental preparedness for killing by RPA aircrew. Months or even years of benign intelligence missions may spur some RPA aircrew to become mentally complacent, even apathetic, towards the more stressful portions of their work.

In *Anatomy of Courage*, Lord Moran identifies monotony as a form of sickness that negatively impacts the human mind.[12] According to Moran, active minds crave activity, and without it they begin to rot.[13] Moran provides a particularly prescient example of this topic from his own combat experience during World War I. Initially, despite a lack of combat action, Moran's mind was engaged and full with thoughts of 'what if' as he remained mentally ready for battle.[14] However, as the war trudged on with no change and no action, he completely gave up anticipating anything to occur on the battlefield.[15] Moran found himself becoming indifferent and mentally disengaged to the world around him.

[12] Charles Moran, *The Anatomy of Courage* (Boston, MA: Houghton Mifflin, 1967), 145.
[13] Ibid.
[14] Ibid.
[15] Ibid.

This same experience may be playing out among MQ-1/9 aircrew as months or even years can transpire between weapons engagements and the requirement to kill.

5. **Weakened Psychological Reservoir** (*Man* Independent variable). The concept of spending one's mental resiliency 'capital' in traumatic experiences and thereafter becoming vulnerable due to a weakened psychological reservoir was discussed briefly for Subject #3. Both Moran and Milgram outline this concept in their respective works and this theory can be expanded to include all RPA aviators with prior traumatic experiences.[16] However, the concept of a weakened psychological reservoir has fleeting applicability based on the current RPA manning construct. Although 53 percent of this study's participants possessed previous combat deployment experience before joining the RPA community, virtually all new RPA aircrew accessions are Pipeline aviators. Thus, even if the idea of a weakened psychological reservoir is valid for RPA aircrew, the community should not display this demographic much longer. Additionally, the concept of a weakened mental reservoir is not universally accepted. The counter-argument can also be made where people experienced stressful situations and

[16] See Norman A. Milgram, *Stress and Coping in Time of War*; and Lord Moran, *The Anatomy of Courage*.

thereafter strengthened their mental capacity to better handle future stress, lessening the chances of mental breakdown in future events.[17]

6. **Friendly Forces Casualty or Death** (*Mission* Independent variable). In addition to the narrative from Case #5, five of the six missions where aircrew reported a significant psychological response also experienced casualties or death to friendly forces. It appears that a shortcoming of this research design was a failure to distinguish among levels of friendly-forces danger for quantitative analysis. Future inquires will likely need to separate friendly danger, casualty, and death to better develop a full accounting of *Mission* independent variables that may impact RPA aircrew.

Overall, case analysis suggests three additional *Mission* independent variables and three *Man* independent variables to the original twelve independent variables presented for consideration in chapter four. This equates to at least eighteen independent variables that may impact the psychological response of RPA aircrew involved in combat operations. A large number of variables, indeed, but unsurprising given the complexity of the human psyche.

Qualitative Discussion

[17] Milgram, *Stress and Coping in Time of War*, 84

Qualitatively, one theme was found to be evident throughout all five cases: RPA aircrew are mentally engaged in their mission and acutely aware of the reality their weapon system imparts on a world several thousand miles away. Even Subjects #1 and #5, while exhibiting minimal psychological response to killing, provided convincing evidence regarding their understanding of the differences between real life and video gaming. Seen through the lens of these case examples, RPA aircrew appear convinced that their aircraft, weapons, and resulting destruction are real, regardless of the distance involved or the medium in which they view their work. Additionally, the details of individual psychological responses were instructive in developing a full understanding of the aircrew beyond the statistical approaches presented in previous chapters. Statistical methods were effective in measuring whether the aircrew exhibited *any* psychological response to killing and their combat environment while the five case examples detailed the *scope and severity* of individual reactions.

Danger to friendly forces proved significant in the case examples, mimicking the statistical findings from chapter five. Two additional areas displayed increasing importance as topic areas for inclusion as well: responsibility and leadership. The burden of responsibility for death and destruction appears a factor to the MQ-1/9 aircrew and appears to separate MQ-1/9 aircrew from other personnel in the RPA community. At a minimum, this concept reinforces the idea that combining *all* personnel who support RPA operations into a single category for analysis and support may not be an effective method. Each job brings different responsibilities and interactions with killing and each of these groups should be approached separately. Based on the earlier statistics and case examples, it appears pilots and sensor operators can be combined into a single group, but further expansion of this demographic beyond pilots and sensors should be engaged with caution.

Leadership also continues to demonstrate its importance as a factor to the MQ-1/9 aircrew and their psychological responses to killing. A properly trained and engaged front-line supervisor should have noticed Subject #4's psychological response before he locked himself in a room following the strike. Squadron leadership should have also recognized Subject #2's extreme duress following his first kill and stopped him from driving home to confront his issues in isolation. Finally, throughout Cases #2 - #4, proactive leadership engagement prior to killing may have prevented or lessened the extreme psychological responses among the aircrew. At a minimum, leaders should have made squadron members feel more at ease with self-identifying their problems and prevented one from trying to drive himself home when he should have sought help and the other from forcing his wife to deal with the emotional baggage because the sensor operator felt he 'couldn't let his bros down' at work.

Conclusion

Case examples provided an opportunity to complement previous statistical analysis and identify additional variables for consideration. The six possible cofounding variables identified during case analysis should further enhance the understanding of the myriad of influences upon MQ-1/9 aircrew engaged in remote combat. The qualitative aspects of the case examples were also useful in placing emphasis on friendly forces in danger, leadership, and responsibility. Overall, qualitative observations were complementary to statistical findings and will assist in the development of final conclusions and recommendations in subsequent chapters.

Moreover, the case examples were increasingly complex as aircrew with nearly identical backgrounds experienced vastly different emotions to very similar events, and aircrew with vastly different backgrounds experienced similar reactions to killing. Aircrew found themselves feeling both positive and negative emotions from the same event, and aircrew that felt very little for some engagements were brought to tears while recalling others. Characterizing modern warfare through the lens of those conducting the mission paints engaged, yet conflicted, warriors deeply concerned about their performance, the mission success, and the safety of the ground forces they support.

Findings and Conclusions

Introduction

For thousands of years humankind has continually moved further and further away from the point of physical engagement during battle. This unending transformation has resulted in palpable physical and emotional distancing between attackers and their targets. At their inception, remotely piloted aircraft (RPA) appeared as the next evolution in this process, providing near complete physical and emotional isolation between combatants. Yet, there is anecdotal and medical evidence indicating RPA aircrew experience mental reactions to warfare as strong as Post-Traumatic Stress Disorder. The confusing array of fact and opinion on this subject demanded a further inquiry focused specifically on the characterization of psychological responses to killing from RPA aircrew. The results of such are useful in not only better understanding RPA aircrew but also in the development of concepts and ideas regarding the impact of modern warfare.

This purpose of this study is to characterize the psychological responses to killing among RPA aircrew and determine their overall level of mental engagement and understanding of warfare despite the distances involved. The study was guided by the research question, “How does killing from a distance psychologically impact RPA aircrew?” The over-arching methodology used to answer the research question involved interviewing over one-hundred MQ-1/9 aircrew who have employed weapons and killed via remote-combat operations and then characterizing their psychological responses to killing. Interview responses were categorized across the emotional, social, and cognitive domains for comparison with *Man*, *Machine*, and *Mission* independent variables chosen for analysis based on expected explanatory power. Additionally, interview subjects were queried on supplementary topics regarding their mental engagement with warfare and video-gaming habits. This chapter provides a summation of findings and conclusions regarding the research, but as a precursor we must first address two more fundamental inquiries:

1) Are RPA aircrew psychologically impacted by killing?
2) Does warfare via RPA feel real to MQ-1/9 aircrew?

Are RPA aircrew psychologically impacted from killing?

Quantitative and qualitative data collected during this study provided convincing evidence that RPA aircrew are psychologically impacted from killing. Focusing on statistics first, 94 percent of the RPA aircrew interviewed for this project reported a first-strike, or first-kill, psychological response in the emotional, social, or cognitive domain. Additionally, three of the seven subjects failing to report a first-strike psychological response reported one for a subsequent engagement, raising the cumulative response rate to 96 percent for all subjects interviewed.

Qualitatively, interview subjects provided highly detailed responses regarding their individual experiences in killing and overall mental engagement to warfare. Five subjects were specifically chosen for detailed presentation and analysis in chapter eight, which highlighted the complexity, amplitude, and duration of psychological responses across nearly all 111 interview subjects. Moreover, interview quotes and detailed cases provided an opportunity to go beyond the polar formatting required for statistical analysis. Disruptive and unresolved psychological responses to killing, including displays of raw emotion years after the event, were a facet of the project that provided resounding clarification regarding whether RPA aircrew are psychologically impacted from killing despite the vast distances involved.

Psychological impacts were also plainly evident in the mental confliction and aversion to killing exhibited by many aircrew. RPA aircrew displayed conflicting positive and negative reactions to the same event, often displaying happiness for the mission success but remorse for the taking of human life. Discussions regarding personal aversion to killing provided additional insight into the covert and overt measures taken by some RPA aircrew in their attempt to avoid taking human life and thereafter bear the psychological consequences. In total, Coker's claim that "War may no longer be a source of feelings, choices, or emotions," has not manifested among the MQ-1/9 aircrew interviewed for this project.[1]

[1] Christopher Coker, *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War* (New York, NY: Columbia University Press, 2013), 174.

Does warfare via RPA feel 'real' to MQ-1/9 aircrew?

Based on the data collected in this study, we can conclude that RPA aircrew are mentally engaged in their work and combat feels 'real' to them despite the distances involved. As described above, the psychological impact of killing demonstrated by nearly all RPA aircrew interviewed is a key indicator that warfare through a video screen and audio speaker can still feel real to the participants. The feelings of reality via remote warfare were largely homogenous among all participants regardless of prior experience. Additionally, the research data does not support the claims of a distorted reality for RPA aircrews due to frequent video gaming. RPA aircrew are not playing video games at rates exceeding societal norms and thus are no more susceptible to desensitization or reality distortion due to video gaming than the average western-society adult. Every RPA crewmember interviewed for this study stated that operating RPAs in combat was not analogous to playing video games.

RPA aircrew also profess to be mentally engaged in combat while they operate their aircraft. 84 percent of aircrew respondents claim they are mentally engaged despite the distance, with a common response of, "Once I'm in the cockpit, I feel like I'm there [combat zone]." Moreover, all but a single subject claiming to be mentally disengaged still reported a first-strike psychological response, with most reporting in at least two domains. Qualitative analysis provided further evidence of highly engaged aircrew as well. For example, Case #1, despite lacking a significant psychological response to killing, provided detailed evidence of his serious and engaged approach to combat operations, stating, ""I had been thinking about it [taking a life]…This is U.S. policy and these are valid targets."

Twenty-two interview subjects offered one final piece of statistical evidence indicating high levels of mental engagement. These subjects provided stories from their RPA combat experience where they had been asked to kill but chose to delay or refused to employ weapons because something 'did not feel right.' (These twenty-two aircrew represent over a third of the total subjects queried on this topic.) All twenty-two individuals steadfastly believe they personally prevented unintended casualties and collateral damage by applying a professional and critical approach to warfare and weapons employment.

How does killing from a distance psychologically impact RPA aircrew?

Armed with a foundational understanding built from the two pre-cursor questions that RPA aircrew, in general, are mentally engaged in combat and psychologically impacted by killing despite vast physical distances, we can transition to the characterization of these aircrew proposed by the original research question, "How does killing from a distance psychologically impact RPA aircrew?" The characterization will be guided by the *Man, Machine*, and *Mission* independent variables first introduced in chapter four. The following section will provide a summation of the statistical data and descriptive cases used to build a holistic picture regarding the psychological responses of RPA aircrew who have killed in combat.

Independent variables were characterized across the emotional, social, and cognitive domains using the tree diagram outlined in figure C.1 below. In addition to the categories contained in the tree diagram, characterizations were also recorded for feelings of mental engagement, psychological preparation, and video-gaming opinions among the interview subjects.

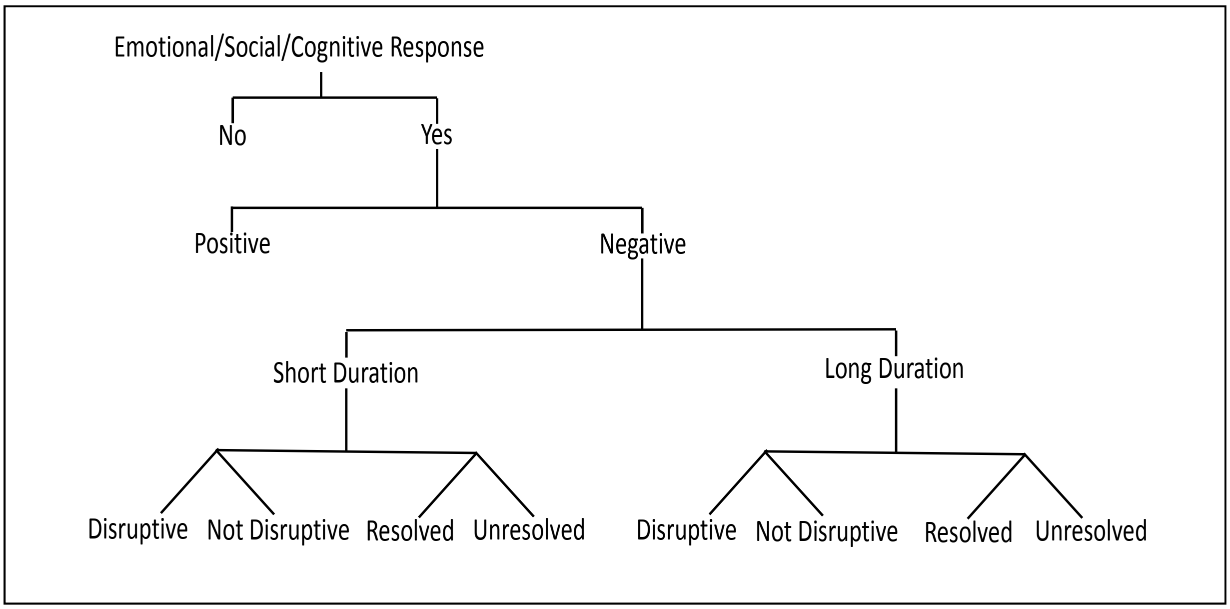


Figure C.1. Emotional/Social/Cognitive Response Tree Diagram

Man Independent Variables

Man independent variables focused on demographic and experience differences among RPA aircrew. Six primary and two secondary demographic groups were chosen for comparison which highlighted the differences in prior experiences among RPA aircrew. The primary *Man* independent variable comparisons included:

1) **Pipeline aircrew versus aircrew with prior manned-aircraft experience.** Pipeline aircrew possess no prior military or manned flight experience prior to joining the RPA community. Aircrew with prior manned aircraft experience have served as a military crewmember on a manned aircraft prior to joining RPA.
2) **No prior combat deployments versus prior combat deployments.** Compares those with prior combat experience (ground or air) against those RPA aircrew who have not previously deployed to a combat zone.
3) **Pilots versus Sensor Operators**. Compares the two aircrew positions in the MQ-1/9 community for resulting differences in psychological response. Job responsibility and training focus were anticipated to manifest in different responses to killing between these two groups.

Secondary *Man* independent variable comparisons were made using aircrew with prior fighter/bomber experiences versus aircrew with prior mobility/reconnaissance experience. These comparisons allowed for a focused comparison of aircrew with extensive manned aircraft and combat deployment experience prior to joining RPA with the addition of prior weapons engagements (killing) in the prior fighter/bomber demographic.

Statistics and Trends

Statistically, differences across individual *Man* independent variables demonstrated several areas of significance and clear trends that distinguished the various demographic groups. Statistically significant responses were recorded across first-strike disruptive-emotional-response and first-strike negative-cognitive-response categories. Both Pipeline and aircrew lacking a prior combat deployment reported statistically significant increases in first-strike negative-disruptive-emotional-response rates compared to their demographic pairs. Additionally, sensor operators reported statistically significant increases of first-strike negative cognitive responses compared to pilots. These comparisons inform us that sensor operators and aircrew lacking prior manned-aircraft or deployment experiences are reacting in a more negative manner than pilots and more-experienced RPA aircrew following their first kill.

Statistically significant comparisons were further supported by the trend data among all *Man* independent variables. In table C.1 below, negative psychological response rankings are presented across the fifteen distinct negative psychological response categories. The demographic reporting the highest rate of negative psychological response in each category was given a "1," the second-highest a "2," etc. The lowest rate and any zero-counters were ranked as an "8."

		Pilots	Sensors	Prior Combat	No prior Combat	Manned	Pipeline	Mobility	Fighter
Emotional	Negative Response	7	3	5	6	3	2	1	8
	Short Duration	2	7	3	6	4	5	1	8
	Long Duration	6	3	7	2	5	1	4	8
	Disruptive	4	3	8	2	8	1	8	8
	Unresolved	6	2	5	3	4	1	8	8
Social	Negative Response	7	1	6	3	5	4	2	8
	Short Duration	7	2	5	6	3	4	1	8
	Long Duration	5	2	6	1	7	3	4	8
	Disruptive	7	2	5	3	4	6	1	8
	Unresolved	4	2	4	1	7	6	3	8
Cognitive	Negative Response	7	1	4	3	5	2	6	8
	Short Duration	8	1	4	3	8	2	8	8
	Long Duration	7	2	6	3	4	1	5	8
	Disruptive	7	1	5	2	3	6	4	8
	Unresolved	7	2	6	3	4	1	5	8
	Average Ranking	**6.1**	**2.3**	**5.3**	**3.1**	**4.9**	**3.0**	**4.1**	**8.0**

Table C.1 Negative Psychological Response Rankings

Average rankings of each demographic demonstrated sensor operators (2.3), Pipeline (3.0), and aircrew lacking a prior combat deployment (3.1) as displaying the highest rates of negative psychological reaction to killing compared to other aircrew demographics. Conversely, pilots with prior fighter/bomber experience reported the lowest rates of negative psychological reaction across every demographic in the study. The trend data in table C.1 further supports the statistically significant evidence that sensor operators, Pipeline aircrew, and aircrew lacking a prior combat deployment are reporting higher rates of negative psychological response than pilots and more-experienced RPA aircrew. Further discussion on the relative rankings within each demographic pair is presented below.

Pipeline Aircrew & Aircrew with Manned Aircraft Experience

Comparing Pipeline aircrew versus aviators with prior manned-aircraft experience produced one statistically significant comparison and several trends and qualitative evidence informing the differences between these two demographics. At the outset, Pipeline aircrew lacking prior combat deployments and manned-aircraft experience were expected to report higher rates of mental disconnection with their mission, resulting in reduced rates of psychological response compared to aircrew with manned-aircraft experience.

Statistically, Pipeline aircrew reported the highest rate of mental disconnection across any demographic (29 percent), although the results were statistically insignificant. However, all Pipeline aircrew claiming to be mentally disconnected from combat also reported first-kill psychological responses across at least one of the emotional, social, and cognitive domains. This result indicated some dissonance in the various responses across these two inquiries and is addressed below.

Trend data indicated Pipeline aircrew were reporting higher rates of negative psychological response than aircrew with manned-aircraft experience in ten of the fifteen categories in table C.1. Additionally, Pipeline aircrew reported statistically significant increases in first-strike disruptive emotional responses as compared to aircrew with manned-aircraft experience.

Evidence for Pipeline aircrew's mental connection to killing and psychological response was buttressed by the case examples as well. Cases #1, #2, and #4 all portrayed detailed examples of a Pipeline aircrew's mental engagement with warfare and strong resulting psychological response. Notable among this group was Case #1, where the subject did not display any disruptive psychological responses, yet still clearly displayed a strong mental engagement with the mission and a high sense of gravity towards killing via RPA. Additionally, Case #2 outlined a Pipeline sensor operator's strong negative psychological response to killing that lasted several weeks and required professional intervention.

Holistically, the quantitative and qualitative data indicates Pipeline aircrew are psychologically impacted by killing at rates exceeding aircrew with manned-aircraft experience despite their elevated rate of feeling mentally disconnected. However, the average rankings of Pipeline versus manned-aircraft experience differed by only 1.9 in table C.1 and Pipeline out-ranked manned-aircraft aircrew in only ten of fifteen negative categories. Both of these statistics were the lowest recorded in the study, indicating that Pipeline aircrew are reporting increased negative psychological responses as compared to aircrew with manned-aircraft experience, but their absolute differences may be less than other demographic pairs.

Finally, the dissonance between mental connection and psychological reaction among Pipeline aircrew requires further discussion. The term 'mental connection' was intended to convey an ongoing psychological connection between the aircrew and their distant combat environment. However, after several aircrew spoke of their frustration regarding the lack of opportunity to 'be there' and physically engage with the planning and debriefing of their mission with friendly forces, it became evident a term such as 'mental connection' could also be used to describe an aircrew's understanding of the overall mission and their role in supporting friendly forces, or lack thereof. Re-examined in this context, it becomes plainly visible how an aircrew can feel mentally disengaged with the mission since they lacked an opportunity to plan and provide input to the friendly ground forces, but still feel psychologically engaged to the realities of warfare and killing.

A second explanation to the dissonance between mental connection and psychological reaction was also considered but discarded. Individuals could have felt mentally disengaged, but then become impacted by the stark reality of killing in combat during their first strike, resulting in a strong psychological response. If true, the first kill should have provided ample evidence regarding the realities of war and greatly increased the feelings of mental connection thereafter. Consequently, this should have resulted in mental disconnection rates approaching or exceeding the rates of zero psychological response across all three domains since aircrew were interviewed for this project *after* the kill. Instead, overall mental disconnection was reported at 16.4 percent while lack of psychological reaction was only 3.6 percent, a statistically significant difference ($p<0.01$). Due to this difference, the 'stark reality' concept was discarded as least probable in explaining the dissonance in Pipeline aircrew responses between mental engagement and first-strike psychological response.

Aircrew with and without a prior Combat Deployment

Comparing aircrew possessing a prior combat deployment with those lacking any previous combat experience produced several trends and a statistically significant category worthy of further discussion. RPA aircrew lacking a prior combat deployment reported a similar level of mental engagement to combat and psychological responses to killing as the Pipeline demographic. Aircrew without a prior combat deployment reported the second-highest rate of mental disengagement (23 percent), exceeded only by the Pipeline demographic. However, similar to Pipeline aircrew, overall feelings of mental disengagement were not supported by resulting psychological responses across the social, emotional, and cognitive domains. Moreover, statistical data largely followed the Pipeline pattern; one item of statistical significance but clear trend data across the entirety of the responses.

Trend data displayed aircrew without a prior combat deployment reporting higher rates of negative psychological response than aircrew with a prior combat deployment in twelve of the fifteen categories in table C.1. The average ranking difference between the two demographic is 2.2, a slight increase compared to the Pipeline/manned-aircraft comparison but significantly lower than several other demographic pairs in the study. Additionally, aircrew without a prior combat deployment reported statistically significant increases in first-strike disruptive emotional responses as compared to aircrew with prior deployment experience.

The combination of quantitative and qualitative data indicates aircrew without a prior combat deployment are mentally engaged and psychologically impacted by killing via RPA. Compared to aircrew possessing a prior a combat deployment, those lacking a deployment indicated increased rates of negative psychological response, with the most significant differences occurring in the emotionally disruptive realm.

Pilots and Sensor Operators

Comparisons between RPA pilots and sensor operators focused on slightly different themes than Pipeline aircrew and aircrew without a prior combat deployment. Across pilots and sensor operators specifically, this study sought to examine job responsibility and prior training as a factor producing psychological-response differences in these two crew positions in the RPA cockpit. Responsibility was chosen as a possible discriminator based on historical examples of combat in crewed aircraft. During World War II, British doctors concluded the higher mental breakdown rates they were experiencing among pilots as compared to other airmen were the result of increased stress and responsibility associated with the position.[2] If these trends continue in RPA, we should expect to document RPA pilots reporting higher rates of stress and negative psychological responses as compared to sensor operators.

[2] Mark Kendall Wells, "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992, 66; Kenneth G. Bergin, *Aviation Medicine; Its Theory and Application* (Bristol, CT: Wright, 1949), 338.

Statistical results and trend data provided clear differences between pilots and sensor operators, but these difference failed to match expected outcomes from prior theories. Instead, sensor operators reported statistically significant increases in negative cognitive responses as compared to pilots. Additionally, trend data indicated sensor operators reporting higher rates of negative psychological response to their first kill than pilots in fourteen of the fifteen categories in table C.1, the second-highest of any demographic pair in the study. Moreover, the average ranking difference between sensor operators and pilots is 3.8, the second-highest in the study. Finally, the case examples provided detail-rich descriptions from both pilots and sensor operators regarding the amplitude, duration, and variation in their psychological responses to killing via RPA.

Holistically, the trend data, statistically significant data, and case examples demonstrated that both demographics are mentally engaged in warfare, yet seemingly significant differences exist in their psychological responses to killing. The rationale presented by Bergin and Wells resulting in World War II pilots suffering higher rates of mental distress did not clearly manifest among RPA pilots in this study. Instead, sensor operators clearly display an increased level of negative psychological response compared to MQ-1/9 pilots.

Prior Fighter/Bomber and Prior Mobility/Reconnaissance Pilots

The secondary analysis of pilots with prior fighter/bomber experience compared against pilots with prior mobility/reconnaissance experience provided a unique opportunity to examine two demographics with very similar combat and flight experiences thrust into a new remote-killing environment. Both demographics have experience in manned flight and combat deployments. The main difference is the lack of weapons employment experience among prior mobility/reconnaissance pilots. Surprisingly, much was uncovered in comparison of these two demographics.

Statistical comparison demonstrated no significance between pilots with prior fighter/bomber experience and those with prior mobility/reconnaissance experience. However, this lack of significance was heavily influenced by the small sample size of prior fighter/bomber aircrew in the study. Rather, trend data collected across all three domains consistently demonstrated prior mobility/reconnaissance pilots experiencing higher rates of psychological response than prior fighter/bomber subjects. Prior mobility/reconnaissance pilots reported higher rates of negative psychological response in all fifteen categories presented in table C.1, the most of any demographic pair in the study. Moreover, the average ranking difference between these two demographic was 3.9, also the highest of any demographic pair in the study.

The supplementary questions provided additional trend data distinguishing prior mobility/reconnaissance aircrew from prior fighter/bomber subjects, although this data was statistically insignificant.

17.8 percent of prior mobility/reconnaissance subjects feel mentally disconnected from combat operations compared with zero prior fighter/bomber pilots. Additionally, only 65 percent of prior mobility/reconnaissance aircrew felt psychologically prepared for their first kill while all but a single prior fighter/bomber pilot stated they were ready.

Prior mobility/reconnaissance pilots reported higher rates of psychological response than *any* other demographic in the study across several categories, developing several trends for further discussion. Pilots with prior mobility/reconnaissance experience displayed the highest overall first-strike emotional response rate, the highest rate of negative first-strike emotional response, and the highest rate of short-duration first-strike emotional response. Additionally, they displayed the highest rate of social disruptive responses. Finally, pilots with prior mobility/reconnaissance experience reported the lowest rate of feeling psychologically prepared for their first strike, exceeding even the Pipeline demographic.

Despite the lack of statistical significance, the trend data suggests pilots with prior mobility/reconnaissance background are experiencing increased psychological impacts of killing when compared to prior fighter/bomber pilots. More interesting, however, is the trend data indicating prior mobility/reconnaissance pilots are meeting or exceeding the psychological response rates of far less-experienced aircrew across several negative categories.

Given their prior combat and manned-aircraft experience, we should expect prior mobility/reconnaissance aircrew to report higher rates of psychological preparedness and lower rates of negative psychological response when compared against more inexperienced demographics. Instead, trend data suggests prior mobility/reconnaissance pilots are not psychologically prepared for killing via RPA at the same rates as their fellow aviators and thereafter are experiencing elevated rates of psychological response that exceed aircrew with similar backgrounds and oftentimes exceed even less-experienced aircrew.

A possible explanation to the prior mobility/reconnaissance aircrew trend data is a lack of preparation and combat mentality resident in their prior manned-aircraft communities. Aircrew that have never been asked to kill in combat may have never developed, or faced, the requirement to view warfare in terms of life and death, regardless of whether they have experience in manned aircraft. Conversely, Pipeline aircrew, despite lacking previous combat and killing experience, are exposed to the seriousness of warfare very early in their aviation career and training pipeline. Colonel Mark Hoehn, Holloman Air Force Base Operations Group Commander, responsible for all MQ-1/9 active duty aircrew production, provides insight into the preparation of Pipeline aircrew for remote-combat.

> I brief them here [Holloman] about the seriousness of the mission. I brief them on the fact that they are going to kill and give them an opportunity to opt out. We don't approach this with a cavalier attitude, but we aren't

> afraid to talk about issues like this either with our trainees.[3]

Hoehn's commentary demonstrates the approach taken by the training community to prepare young and inexperienced aviators for their role in warfare. It also refutes Calhoun's claims that, "Training [RPA aircrew] to kill in the manner of sociopaths with no feelings whatsoever for their victims because they are but icons on computer screens is a frightening prospect."[4] RPA aircrew may be targeting 'icons on a computer screen' but their leadership is working to ensure they fully understand the realities that underly their technological approach to modern combat.

Whether the training program for Pipeline aviators or the prior experiences of mobility/reconnaissance aircrew is causal in explaining the outlier status of the mobility/reconnaissance demographic is a challenging hypothesis to isolate and investigate. Characteristically, however, the prior mobility/reconnaissance demographic displayed clear trend data that they experience stronger psychological reactions to killing via RPA that many other demographics selected for investigation in this study.

---

[3] Colonel Mark Hoehn, 49th Operations Group Commander (interview with author), September 15, 2014.

[4] Laurie Calhoun, "The End of Military Virtue," *Peace Review* 23: 381.

Man Independent Variables - Concluding the Discussion

Overall, the quantitative and qualitative data indicate all RPA aircrew demographics are psychologically impacted by killing and feel mentally engaged in combat despite the large physical distance. Trend information and statistically significant data indicated differences in response rates across *Man* independent variables, with sensor operators, Pipeline aircrew, and aircrew lacking a prior combat deployment reporting higher rates of negative psychological response than their demographic pairs. These findings must be approached with caution, however. The lack of accepted societal standards for psychological responses to killing makes it extremely difficult to state whether any demographic in this study is reporting too much or too little psychological response. We can only state for certain that MQ-1/9 aircrew are mentally engaged in warfare, feel psychologically impacted by killing, and various demographics in the MQ-1/9 community are reporting different rates of psychological response.

Finally, the trend data regarding prior mobility/reconnaissance aircrew remains puzzling. While the relative increases in psychological response across this demographic were clear, easy explanations lie beyond our grasp. Additionally, given the gradual phasing-out of all prior manned-aircraft pilots in the RPA community, subsequent opportunities for additional analysis may be hampered by lack of available interview subjects.

Machine Independent Variables

Machine independent variables sought to examine the differences in psychological response among aircrew who have employed with standard-definition (SD) video and those who have employed with high-definition (HD) video. Given that HD video increases the amount of detail in the scene, the expected outcome was an increase in negative psychological response rate.

The aggregate responses of *Machine* independent variables across quantitative and qualitative data was insignificant and provided little evidence that HD video impacts the psychological responses of killing via RPA when compared against the original SD video. While several interview respondents reported weapons engagements using HD video, none reported a change in their psychological response despite noting 'increased gore' with the higher fidelity picture.

Moreover, the large quantity of archived strike videos available for viewing by all combat RPA aircrew provides additional evidence that significant gore, even in high definition, is not impacting RPA aircrew. If simply viewing strike-video provides inoculation against significant psychological response then this study should have recorded almost no disruptive or negative emotional reaction to killing. Conversely, if simply viewing strike video provides ample stimulation that could trigger negative psychological responses on a large-scale, we would expect this issue to be recorded for consideration and analysis. Instead, it appears that viewing death and destruction on a video screen, high-definition or not, is simply not the same mental experience as wielding personal responsibility for another's death, even at the vast distances employed by RPA.

Mission Independent Variables

Mission independent variables characterized the differences in psychological response for aircrew engaged in their first strike versus those engaged in mission-specific events that were postulated to cause stress or increase euphoric responses. Additionally, target tracking time was applied as a *Mission* independent variable and characterized the changes in psychological response when aircrew tracked their targets for a significant portion of time prior to killing them. Mission-specific variables of friendly forces in danger, near or actual unintended collateral damage, and near or actual unintended casualties were evaluated across the emotional domain with statistical analysis, case examples, and additional evidence taken from interview responses. Overall, *Mission* independent variables provided convincing quantitative and qualitative evidence that mission-specific events are a significant factor impacting RPA aircrew psychological responses and lent additional confirmation to the mental connection between MQ-1/9 aircrew and their combat environment.

Mission-specific events provided the highest rate of statistically significant comparisons across the entire study despite relatively small sample sizes. Mission-specific emotional responses exceeded first-strike emotional response in all categories chosen for comparison: overall emotional response rate, negative emotional response rate, disruptive emotional response rate, and unresolved emotional response rate. Statistical significance was reported in the negative emotional response rate for first-strike versus all three mission-specific categories. Additionally, missions with friendly forces in danger exhibited the highest emotional response rate of any independent variable used in the study.

Based upon the statistical analysis, aircrew involved in mission-specific events are at much increased odds for a psychological response than those conducting their first-strike.

- Aircrew employing weapons in support of friendly forces in danger were 3.0 times more likely to experience a negative emotional response than those engaged in their first strike.
- Aircrew employing weapons that resulted in near or actual collateral damage were 4.1 times more likely to experience a negative emotional response than those engaged in their first strike.
- Aircrew employing weapons that resulted in near or actual unintended casualties were 7.2 times more likely to experience a negative emotional response than those engaged in their first strike.

Additionally, case examples and interview commentary were informative in understanding the depth of psychological responses experienced by aircrew involved in mission-specific events. Cases #4 and #5 in support of friendly forces in danger were especially relevant and provided a glimpse into some of the most significant psychological responses described by any interview subject in the study. The subject for Case #4 was unable to perform simple tasks such as driving a car after feeling the psychological impact of supporting friendly forces under enemy fire. During the interview session for Case #5, the subject broke down when describing his mission where friendly forces had died while his RPA circled overhead two years earlier.

Finally, several subjects claimed their mission satisfaction and psychological response was more a product of supporting friendly forces than employing weapons. In many cases weapons engagements were not required for the aircrew to develop a deep sense of satisfaction regarding their job. These examples suggest a completely different angle from which to view psychological responses to warfare instead of solely focusing on killing.

Combining the quantitative and qualitative data regarding mission-specific variables resulted in convincing evidence that mission-specific events play a significant role in determining the psychological responses among RPA aircrew engaged in combat operations. The results also indicate a high level of mental connection between RPA aircrew and the ground forces they support despite the vast physical separation.

These RPA aircrew characteristics resemble previous examples of aircrew and soldiers impacted by significant responsibility in battle. In *The Psychology of Conflict and Combat*, Ben Shalit demonstrates that war-veteran officers in the Israeli forces were more frightened of letting others down in combat than their own death.[5] Taking this concept a step further, Shalit claims that ground-air controllers located in a safe location physically separated from battle could feel more stress than if they were actually involved in the direct battle.[6] For the controllers, the increased stress is caused by the responsibility

[5] Ben Shalit, *The Psychology of Conflict and Combat* (New York, NY: Praeger, 1988), 11.
[6] Ibid, 13.

placed upon them, creating even more stress than actual combat itself.[7] Applied to current MQ-1/9 operations, this concept can help explain why RPA aircrew are psychologically impacted by their actions despite the distance involved. Unlike Shalit, however, this study makes no leap to claim RPA aircrew are feeling *more* stress than the soldiers on the ground that they support. Instead, Shalit's observations help one understand *why* the RPA missions supporting friendly forces in danger demonstrated the highest potency for psychological impact as compared to all other mission-specific and first-strike events. Bradley Strawser provides additional thoughts on this topic in *Killing by Remote Control.*

> It might be argued that a form of courage is still necessary to be able to pilot [RPAs]: moral courage. Pilots of these systems must be willing to make life-or-death decisions, including the decision to kill another person, in circumstances where making the wrong decision may lead to the death of other [friendly] warfighters.[8]

Based on the interview results, this may be exactly what is occurring across the RPA community. Successfully supporting friendlies often produced a strong positive cognitive response, while negative responses often resulted from a perceived failure or inability to fully support the friendly-forces' mission or prevent friendly casualties, regardless of the success of the actual weapons engagement.

---

[7] Ibid.

[8] Bradley J. Strawser, *Killing by Remote Control: The Ethics of an Unmanned Military* (New York, NY; Oxford University Press, 2013), 93.

Finally, one *Mission*-independent variable that failed to produce statistically significant results was target familiarity. Interview subjects were queried on their target familiarity for all strikes during the interview process, with a follow-up question on whether they developed any personal or intimate connections with their targets, especially ones that were tracked for an extended period of time. While several interview subjects stated they had tracked targets for an extended period of time, all interview subjects denied developing any personal connections with targeted individuals. Furthermore, no interview subject recalled having any specific emotional, social, or cognitive responses to striking targets that were tracked for an extended period of time.

Additional Findings

Video Games

In addition to characterizing psychological reactions to killing, this study sought to investigate video-gaming habits and video-gaming mentality of RPA aircrew as possible foundational rationale to their psychological responses to killing, or lack thereof. Specifically, subjects were queried on their levels of video-game playing on personal time, their feelings towards the RPA system as a video game, and their responses towards comparatively discussing RPA operations and video games.

Overall, interview subjects averaged 2.4 hours of video gaming per week over the three months preceding the interviews. Variations included RPA aircrew who reported no video gaming in the past three months and eight out of 111 subjects who reported playing at least ten hours per week. Comparing data to other video-gaming studies, RPA aircrew appear to be playing video games in their personal time at similar rates to other western adults.[9] While this finding may provide some with a sense of normalcy regarding RPA aircrew, the more relevant fact is we currently lack an accepted standard for video-gaming frequency. Thus, RPA aircrew playing 2.4 hours per week becomes curiously interesting and moderately comforting, yet remains largely irrelevant due to the lack of true societal standards. It does, however, soundly refute

[9] A 2008 Pew Internet study was used for the primary comparison between RPA aircrew and western-society adults. See chapter six for further details.

Coker's claims that RPA aircrew are averaging upwards of eighty hours a week in online gaming.[10]

Aimed at increasing the relevance across the video-gaming discussion, subjects were queried on whether they considered RPA operations to be a video game and how did they feel about such a comparison. In response, RPA aircrew were unanimous in their statements that RPA operations were not a video game. This point cannot be overstated. Every interview participant, regardless of demographic, psychological response to killing, feelings of mental connection, or personal opinion on the ethics, morality, or legality of killing from a distance were united in their conviction that RPA combat operations were not a video game. The most common reply revolved around a rejection of the concept that adding technology to warfare makes combat a game, with many subjects stating, "Watching [combat] through a video is not equal to a video game."

Moreover, only one in six aircrew interviewed considered any video-gaming-to-RPA comparison to be worthy of valid discussion. Most subjects claimed the two concepts were so different that they would prefer not to engage in a comparative debate or claimed to be personally insulted by such a comparison. Perhaps the interview subject that encapsulates the overall attitude best stated, "It's nothing like a video game. Nobody gets hurt in video games. I hate that comparison."

[10] Christopher Coker, *Warrior Geeks*, 134; The highest video-gaming rate for any subject in this study was reported at 30 hours per week.

Professor Ken Hines offers the final view on this issue.

> Is it [RPA] "video-game" warfare? This question reflects a profound misconception about those piloting drones suggesting drone operators are so removed from the battlefield that the experience of war is like playing a video game. No doubt, the distance between the human warfighter and the battlefield has never been longer, but the psychological proximity can be closer for drone pilots than for other military personnel. Despite the superficial similarities between playing video games and remote piloting of drones, the latter is serious work for operators as well as deadly for victims. Dismissing it as video gaming does not convey the true nature of the experience. There is moral agency involved and good pilots are well aware of that.[11]

Based on the results of this study, all pilots interviewed for this study met Hines' 'good pilot' threshold.

Overall, the aggregate of responses clearly demonstrate RPA aircrew do not consider their occupation akin to playing video games. Instead, they claim to be serious, professional, and mentally engaged in their activities despite the vast physical distances involved.

Psychological Preparation to Kill

Comparisons between psychological preparedness to kill and first-strike negative psychological responses were illuminating. The two demographics reporting the highest rates of feeling psychologically ill-prepared to kill also reported the highest rates of first-strike negative emotional response: Pipeline

[11] Ken Hines, "Good and Bad Questions about Drones in Warfare" (lecture, *Drones In Focus Conference*, Boston College), November 15, 2014.

aircrew and prior mobility/reconnaissance aircrew. Conversely, aircrew with fighter/bomber aircraft experience reported the highest rates of feeling psychologically prepared to kill and thereafter experienced the lowest rate of first-strike negative emotional response. These statistics shed light onto Grossman's claims that psychological responses to killing are largely pre-determined.

> I am convinced, based on interviews with hundreds of men and women who have had to kill, that if you tell yourself that killing will be an earth-shattering, traumatic event, then it probably will be. But if you do the rationalization and acceptance ahead of time, if you prepare yourself and immerse yourself in the lore and spirit of mature warriors past and present, then the lawful, legitimate use of deadly force does not have to be a self-destructive or traumatic event.[12]

As Grossman instructs, those RPA aircrew who felt ready to kill were largely spared any negative psychological response while those feeling ill-prepared reported increased rates of negative reaction following their first-kill.

Aircrew Conflicted

In addition to demonstrating a mental connection to combat and psychological responses to killing, RPA aircrew in this study also reported conflicting reactions to the same and subsequent events. Moreover, interview subjects reported decidedly different responses to killing under similar circumstances, with some reporting an aversion while others were euphoric

[12] Dave Grossman and Loren W. Christensen, *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*. 3rd ed. (Illinois: Warrior Science Pub., 2008), 170.

following a mission. These details are instructive in building a full understanding of the spectrum of psychological responses and mental engagement of RPA aircrew in their deadly operations irrespective of demographics as examined by *Man* independent variables.

Regarding aircrew confliction, 22 percent of the aircrew who reported a first-strike emotional response experienced both positive and negative emotions to the same event. Similarly, 17 percent of aircrew reporting a mission-specific emotional response felt both positive and negative emotions. In both categories the typical response was a positive one regarding mission success and helping friendly forces juxtaposed with negative emotions for having taken a human life. One subject stated, "I was proud and excited at first. After a couple days it wore off…it's a little different when you are alone with your thoughts." These feelings of remorse and guilt resemble Sherman's claim in *The Untold War,* "In the case of a soldier, guilt is often a testament to a sense of moral accountability in the use of lethal force."[13] Using Sherman's concept, RPA aircrew are demonstrating a measure of moral accountability in their use of deadly force based upon their psychological reactions to killing.

Additionally, anecdotal evidence indicated aircrew emotional responses varied widely when measured from the first to subsequent strikes and were largely dependent on the mission details and results of the strike. Case #5 provides an excellent example of this characteristic. While the subject for Case

---

[13] Nancy Sherman, *The Untold War: Inside the Hearts, Minds, and Souls of Our Soldiers* (New York, NY: W.W. Norton, 2010), 91.

#5 reported minimal psychological responses for his prior strikes, the friendly-forces-in-danger mission used in the case example resulted in a significantly negative emotional response for his mission-specific event.

RPA aircrew also reported an aversion to killing at unanticipated rates, requiring modification to the interview questions after several sought to discuss the issue without inquiry from the examiner. Eight subjects (7.2 percent) stated they were uncomfortable with killing, with four of them (3.6 percent) purposely opting out of a mission to avoid killing, although only two aircrew informed their leadership. Two others covertly adjusted the flying schedule to avoid a mission where killing was likely. The remaining four aircrew who were averse to killing stated they would still perform the mission out of a sense of duty or not letting other members of the squadron down. Further historical inquiry revealed that at least ten MQ-1/9 aircrew have been removed from flight duties over the past four years due to aversion to killing.[14]

In *On Killing* Grossman states he was unable to find a single instance of a combatant refusing to kill at his defined 'maximum range.' This study further increased the physical distance between attacker and target for the purposes of comparison, expanding beyond Grossman's 'maximum range' and redefined a new threshold.[15] Despite the increase, RPA aircrew were still found who both overtly and covertly refused to kill. Moreover, data provided by the

[14] Jeremy Haskell, 432 Wing Operational Psychologist, Creech Air Force Base, Nevada, email to author, January 8, 2015.
[15] See chapter three for further details.

medical community (removing at least 10 personnel due to killing aversion) provided further evidence of this issue's existence despite a physical distance exceeding the one portrayed in *On Killing*.

On the positive side of emotional response, four interview subjects reported euphoria lasting longer than 24 hours following at least one of their strikes. However, the euphoria emanating from these four RPA aircrew was focused on the mission success and eliminating threats to friendly forces as their source of their happiness vice the act of killing. A single interview participant expressed a desire to kill more and this subject was not one of the four euphoric subjects.

The variety of emotions coupled with fluctuations within many aircrew provides key evidence that robot-like operators void of emotion or understanding of their work does not accurately portray RPA aircrew involved in remote-killing. Instead, these RPA aircrew conflicted on killing resemble the Israeli snipers studied previously by Bar and Ben-Ari. Bar states, "Snipers continue to do their work in a cool and calm manner out of a full belief in the justice of their cause. Indeed, the belief that they are preventing the next terror attack or suicide bomber is a key motivator for them."[16]

The separation of emotions regarding combat and killing is also displayed in Col "Bud" Anderson's memoirs as a World War II fighter pilot.

> I enjoyed combat, which is not quite the same thing as saying that I enjoyed killing. Combat was exciting,

[16] N. Bar and E. Ben-Ari. "Israeli snipers in the Al-Aqsa Intifada: Killing, humanity and lived experience," *Third World Quarterly* 26, No. 1 (2005): 138.

> addictive, a test of our mettle and manhood -- a crucible in which men became a cut above the ordinary.[17]

Anderson's memoirs provide an avenue to explain the exhilaration of a successful mission, even the employment of weapons, juxtaposed against the harsh reality of killing for the RPA aircrew. Additionally, unlike Anderson, many RPA aircrew remain on station for hours after the kill and view the deadly aftermath of their strike--a reality seldom seen by bomber or fighter aircrew in previous wars.

In *An Intimate History of Killing*, Joanna Bourke identifies one variation in this theme of conflicting emotions. Bourke claims snipers find pleasure in their killing, "Because it enables men to display their individual skill in a war [Vietnam] that provided very few alternative outlets."[18] These characteristics can be seen in RPA aircrew as well. Literally hundreds of hours are spent accomplishing the benign, and relatively easy, intelligence-gathering mission. The skill required to employ weapons creates a challenge and a method to distinguish oneself from peers in a positive or negative light. Knowing that a personal reputation, and possibly the reputation of an entire squadron, rests on the outcome of a single engagement, aircrew feel an immense responsibility on their shoulders.

[17] Clarence E. Anderson, *To Fly and Fight: Memoirs of a Triple Ace* (Pacifica, CA: Pacifica Press, 1999), 140-141.
[18] Joanna Bourke, *An Intimate History of Killing: Face-to-face Killing in Twentieth-century Warfare* (New York, NY: Basic Books, 1999), 49.

Success, then, is a credibility boost for the aircrew involved and proof they have the mettle to think and act quickly during demanding weapons-engagement missions. In total, they gain personal satisfaction not only from the challenge of successfully navigating one of the most demanding scenarios they could execute as MQ-1/9 aircrew, but also from their increasingly positive reputation, or 'street cred,' as someone who knows their business and can be counted upon to get the mission done. This concept is clearly evident in the first-strike statistics where 93 percent of aircrew reporting a first-strike cognitive response claimed it was positive, regardless of their emotional or social response. One interview subject claimed, "Striking is street cred, whether you admit publicly or not."

Decompression Time

The individual stories relayed within Cases #2, #3, and #4 provided anecdotal evidence regarding decompression time as a confounding variable that further impacts psychological responses to killing by RPA aircrew. All three subjects experienced negative disruptive emotions following their first kill, and all three stated their squadron did not typically engage in post-mission socializing.

These indicators led to a review of all subject's first-strike emotional response compared against their squadron's preference for group socializing after a strike mission. Overall, only 24 percent of interview subjects reported post-strike socializing as 'common' in their squadron. However, across the subset of aircrew that reported post-strike socializing as common in their squadron, only 15 percent reported a negative first-strike response. Conversely, aircrew that stated their squadron did not typically socialize post-engagement reported a 36 percent first-kill negative emotional response rate. Statistical analysis was significant for this comparison (p=0.05) and subsequent odds ratios revealed that aircrew assigned to squadrons that do not typically socialize after a mission are over three times as likely to report a first-strike negative emotional response as those who do socialize. More strikingly, every person who reported a first-strike negative disruptive response was from a squadron that did not regularly socialize post-mission.[19] These case examples and subsequent statistical evidence provide convincing rationale that lack of decompression time via socialization with mentors and peers is correlated with an increase in negative first-kill psychological responses.

Leadership

Closely related to the post-strike socializing issue, leadership support to aircrew from front-line supervisors through squadron command clearly impact both the mental preparation for killing and the resulting rationalization and mental processes aircrew engage following at least their first kill. Although the exact impact was difficult to quantify via statistical methods, aircrew repeatedly noted the positive impacts of strong leadership support in ensuring they were

[19] There was one 'no response' of socializing for a negative disruptive subject because the interview went beyond allotted time and the question was not asked.

prepared beforehand and supported after a weapons engagement. Additionally, the case examples demonstrated clear examples where lack of leadership involvement in pre and post-mission events contributed to the duration of negative psychological responses.

Moreover, the seriousness of killing as a topic approached by the training group at Holloman Air Force Base is likely a key reason the inexperienced Pipeline demographic did not report statistically significant differences in their mental preparation or response to killing, further highlighting the importance of leadership involvement in the mental preparation among RPA aircrew.

Subject Age

Subject age, originally proposed as an independent variable for analysis, proved inconclusive but intriguing as a variable worthy of future consideration. Combined with the trend data from table C.1, age appears closely aligned with the rankings of negative psychological response. Every demographic that reported higher rates of negative psychological response was younger than its corresponding demographic pair.

- Pipeline: Average 9.3 years younger than Manned-Aircraft background
- No prior combat deployment: Average 6.9 years younger than pair
- Sensor Operators: Average 2.9 years younger than pilots
- Mobility/reconnaissance: Average 0.9 years younger than fighter/bomber

However, the amplitude of age variation and psychological response rates was inconclusive. For example, prior mobility/reconnaissance aircrew were the closest in age to their demographic pair, yet reported the most significant differences in negative psychological response trends for their first strike. Pipeline aircrew averaged the biggest age difference compared to aircrew with prior manned-aircraft experience, yet reported the fewest trend differences in negative psychological response.

Age remains a worthy independent variable for future analysis but its correlation to psychological response was inconclusive in this study. The only conclusive age-based evidence gained during this study was that younger aircrew play video games at higher rates than older aircrew, although the younger aircrew still did not exceed societal norms for video-gaming rate.

On the Character of Modern Warfare

> Fighting from behind a computer is not as emotionally potent as fighting on the battlefield.
> - Lambér Royakkers and Rinie van Est

While this study demonstrated that MQ-1/9 aircrew are mentally engaged in their deadly profession and psychologically impacted by killing, the quote above from Royakkers and van Est may also prove true. Physical and technological distancing of RPA aircrew from their targets may be reducing the potency of their engagement and subsequent reactions to killing in warfare as compared to other warriors and methods. However, without a comprehensive data set from which to compare MQ-1/9 aircrew to other killers, we cannot state for certain that RPA aircrew are more or less mentally engaged and psychologically impacted than their manned-aircraft counterparts or the sniper who kills from distances that were considered blasphemous several centuries ago.

Rather, this study provides utility in demonstrating that the mental engagement with warfare and psychological reaction to killing still exists among contemporary warriors and has not been reduced to zero in the MQ-1/9 community as claimed by several authors. The continuing ethical and moral relativism society uses to place new weapons and methods on the battlefield are in plain view with the MQ-1/9; perhaps even more so given the ability for the general public to view killing via RPA as quickly as one can type "MQ-1 Strike" into a Google search query. But this fact has not reduced the psychological engagement among the aircrew to zero, or even to an amount small enough that we should begin to question their ability to comprehend warfare and killing despite the vast distances involved.

This grander context suggests that MQ-1/9 simply represent another step in the evolution of distance-based warfare. We should have anticipated the cries of airmen, soldiers, and statesmen lamenting the morphing of contemporary warfare into a video game devoid of seriousness and lacking any recognition of the noble warrior traditions currently in use. They echo the slow acceptance rates of previous weapons and methods for much the same rationale. Chapter one provided examples of bowmen, riflemen, machine-gunners, and submariners all experiencing similar critiques as they were introduced onto the battlefield and grudgingly accepted. RPA aircrew have fared no better or worse in this regard.

This cycle of *critique-accept-repeat* is a trend that has persisted for centuries. The once-critiqued operators of today's manned aircraft and their civilian leaders have found themselves thrust to the mountaintop of moral leadership, and it has become their turn to pass judgment on the next evolution of technological progress represented by weapon-laden RPAs. Some have accepted MQ-1/9 as a viable weapon of warfare. Others remain skeptical, and a few wish for a return to a time where only manned aviation was welcome in the skies.

This continuing process is not inherently good or bad, it just *is*. If the trends established by hundreds of years of history continue, we shall soon enough have MQ-1/9 pilots critiquing the next evolution in warfare (perhaps in cyber or automation) for its lack of warrior tradition and psychological connection between combatants. That is, unless, the mantle is never passed to RPA aviators because their weapons and craft have been banned from the battlefield, effectively ending the community and the careers of those who operate the MQ-1/9. While a desirable outcome for some, it is highly unlikely given the proven utility of these aircraft, their sensors, and their weapons.

In the discussion and debate regarding RPAs and killing, the biggest issue society failed to notice was the ability for technology to both *separate* and *connect* the warrior to the fight. Developing a myopic focus on the negative aspects of technological advancement in warfare via RPA caused us to lose sight of the grander picture, completely missing new opportunities and characteristics of remote-warfare. Technology is clearly *connecting* MQ-1/9 aircrew to warfare in ways that demand change in the way society views technology in RPAs and subsequent warfare methods and weapons. The current theories presented in chapter three focus on physical and technological *distancing*, but hardly a word is mentioned regarding *connection*.

Perhaps the video clip itself should shoulder much of the blame for this shortcoming. The public can easily view an RPA strike video via the internet that lasts five to thirty seconds and might be set to music. Under these circumstances, it becomes easy to think of killing via MQ-1/9 as less-than-serious and almost game-like to the aircrew. But the internet video lacks the additional sensory inputs of voice, data, and cockpit displays that connect the aircrew to the ground forces they support. Additionally, these short video segments lack background and context on the mission and the many hours spent preparing before the decision to kill was relayed to the aircrew. The superficial aspects of the video itself provide an easy avenue to declare that war has become a video game when one does not comprehend or have access to the rest of the story.

Even veteran fighter pilots with no RPA experience are at risk of viewing MQ-1/9 operations as a video game because they do not possess first-hand knowledge of vast array of sensory connections that bring the RPA aircrew into the fight. Recently, an F-16 pilot with years of fighter experience and several combat deployments was invited to sit in an MQ-9 cockpit and observe a Close Air Support (CAS) training mission. The mission consisted of a small group of friendly ground forces entering a hostile village and coming under fire from over a dozen enemy, requiring immediate CAS assistance and weapons from an MQ-9. Following the sortie, the F-16 pilot was asked what he thought about the mission.

> It *felt* like CAS. Even though we were sitting in a box on the ground miles away from the action, I could feel my heart rate rising and my adrenalin start flowing when those friendlies took fire. It was real and I did not think it was going to be like this. It was a lot like being in the F-16.

The F-16 pilot recognized the similarities between his manned aircraft and the MQ-1/9, but only *after* experiencing combat through the eyes and ears of the MQ-1/9 system. Prior to this episode, this F-16 pilot's experience with killing via RPA was restricted to watching post-strike videos in the same manner as most other personnel curious about RPA operations. Simply, he was unaware of the ability for the technology inherent in the MQ-1/9 system to mentally *connect* him to the battlefield.

Overall, we must leave the question of how far the mental engagement to warfare and resulting psychological response has shifted in the MQ-1/9 to future studies that can reliably compare the MQ-1/9 aircrew versus other actors in warfare. For now, we can only state with certainty that MQ-1/9 aircrew are demonstrating a mental engagement to warfare and psychological response to killing that conclusively proves warfare has not been reduced to an abstract version of itself, a video game, in the RPA world.

SUMMARY

Characterizing modern warfare through the lens of RPA aircrew projects the image of engaged, yet conflicted, warriors deeply concerned about their performance, mission success, and the safety of the ground forces they support. The research began with a seemingly simple question, "How does killing from a distance psychologically influence RPA aircrew?" The responses, however, were increasingly complex, as aircrew with nearly identical backgrounds experienced very different emotions to similar events while aircrew with vastly different backgrounds largely experienced similar reactions to killing. Aircrew found themselves feeling both positive and negative emotions from the same event, and aircrew who felt very little for some engagements were brought to tears while recalling others. Moreover, some of the most significant psychological responses occurred when aircrew did not kill during their mission.

In general, independent variables chosen for analysis provided little statistical significance, yet trend data and detailed case examinations provided compelling evidence that indicates differences across several variables chosen for analysis. Across *Man* independent variables, sensor operators, Pipeline aircrew, and aircrew lacking a prior combat deployment consistently reported higher rates of negative psychological response categories compared to their demographic pairs. Aircrew with prior mobility/reconnaissance background provided surprising results; feeling the most psychologically unprepared for combat among any demographic and thereafter reporting the highest rate of negative psychological responses across three categories in the emotional and social domains.

Machine independent variables were insignificant in this study. Aircrew using high-definition cameras reported no increases in psychological response across any category when measured against response rates for the standard-definition video. *Mission* independent variables were also mixed in their explanatory power. As an independent variable, target familiarity demonstrated no quantitative or qualitative features that impacted aircrew psychological response rates. Mission-specific events, however, demonstrated the highest rate changes in psychological response for the entire study. Specifically, mission-specific events which included friendly forces in danger, near or actual collateral damage, and near or actual unintended casualties provided statistically significant and qualitative evidence of correlation with higher rates of psychological response. Among this group, missions with friendly forces in danger resulted in the highest psychological response rates for any independent variable measured in the study.

Regardless of psychological response, one theme was found to be evident across all cases; RPA aircrew are mentally engaged in their mission and acutely aware of the reality their weapon system imparts on a world several thousand miles away. All RPA aircrew seem completely ensconced in the knowledge that their aircraft, weapons, and resulting destruction is real, regardless of the distance involved or the medium in which they view their work. Their work, while largely conducted through a technological aperture to the combat environment, is not a video game to the aircrew involved. Technology has allowed them to physically separate themselves from the battlefield, but connects them in a psychologically significant fashion.

Recommendations

Based upon the findings and conclusions presented in the previous chapter, several recommendations are presented for consideration. The recommendations are broken into two categories.

1) Within the MQ-1/9 community
2) External to the RPA community

Within the MQ-1/9 community

1) Standardize and increase proactive measures to better prepare future MQ-1/9 aircrew for the psychological aspects of remote-killing

Two factors will markedly increase the number of Pipeline aviators in the MQ-1/9 community over the next several years, likely resulting in an overall increase in the aggregate total of negative psychological responses if no changes are made. First, approximately one-third of the current MQ-1/9 population consists of Pipeline aircrew, but the USAF has shifted to an accessions plan that will focus almost exclusively on Pipeline aircrew.[1] Second, the overall MQ-1/9 population is continuing to grow, leading to increases in Pipeline aircrew, independent of changes to the overall accessions plan.[2]

As the numbers of Pipeline aircrew and aircrew without a prior combat deployment increase within the RPA community, we should anticipate

[1] Michael Lewis, Headquarters United States Air Force, AF/A3O, email to author, October 3, 2014

[2] In personnel terms only, the community is forecast to grow by at least 30% in the next 3-5 years. (Source: Author).

increases in the total number responses across the following negative categories:

1) Negative psychological responses in the emotional, social, and cognitive domains.
2) Feelings of mental disconnection.
3) Feelings of psychological unpreparedness for killing.

In planning for increased numbers of Pipeline aircrew, the RPA community should standardize and increase proactive measures to better prepare aviators for remote-killing. Regarding standardization, the pre-combat discussions and preparation that are currently conducted by the training squadrons should become a standard feature in the MQ-1/9 Initial Qualification Training (IQT) curriculum. Trainees are receiving this training informally at Holloman Air Force Base during MQ-1/9 IQT. These procedures should be standardized and codified into the IQT syllabus. Additionally, where logistically feasible, an introduction to the mental aspects of killing via RPA should be included in the Undergraduate RPA Training syllabus--providing an opportunity to engage with aircrew before they begin their MQ-1/9 IQT course. Standardization and codification of this program will better prepare RPA aircrew for the mental aspects of warfare and remote-killing prior to arrival at their combat squadrons. An additional benefit is further opportunity to identify individuals averse to killing before they are sent through the training course and arrive at their combat squadron.

Second, expansion of the proactive measures requires leadership support within the operational squadrons. Front-line supervisors play a critical role when mentoring their subordinates in preparation for a kill and supporting them after the mission. This important role should be expanded by ensuring front-line supervisors (through squadron commander) understand the role they play, receive training on the aspects of mentor/support they are expected to provide their subordinates, and encouraged (or required) to follow-through with their personnel on this issue.

The MQ-1/9 community should approach the psychological health of their aviators as both a personnel and mission imperative. While individual personnel are sometimes psychologically impacted by killing and deserve adequate support and care, the secondary effect is the risk to mission failure when aviators are unavailable for duty. Given today's budgetary constraints, a fully trained aviator in an operational squadron is a valuable asset that is extremely difficult to replace. Proactive measures such as these provide the double benefit of taking care of personnel while adding to combat capability by helping all airmen stay engaged in the fight.

Additionally, suggested 'target' psychological response rates can be derived from this study's demographic data on more-experienced aviators across the disruptive and unresolved categories in the emotional, social, and cognitive domains. For example, while 20 percent of Pipeline aircrew displayed a first-strike disruptive emotional response, both the prior manned aircraft and prior combat-deployment demographics reported no disruptive emotional responses. Reducing the Pipeline disruptive responses to zero would align the various aircrew demographics and reduce lost work-days due to mental issues among the Pipeline demographic.

While this approach is feasible for first-strike negative-disruptive and unresolved responses, further expansion to include all psychological responses, or at least all negative psychological responses is not recommended. As discussed in earlier chapters, the display of negative psychological responses short of those causing disruption or lacking resolution have not proven themselves to be such a horrible feature that they need to be completely stamped-out from the MQ-1/9 community. Negative psychological responses provide some measure of assurance that RPA aircrew exhibit normal psychological responses to killing and are mentally engaged in combat. This is especially true for ones that occur following mission-specific events such as friendly forces in danger and near or actual collateral damage.

2) Combat deployment and manned aircraft experience

Closely related to the proactive measures described above, the MQ-1/9 community should seek and develop opportunities for their aircrew to deploy into combat zones and also gain manned aircraft experience. Providing RPA aircrew an opportunity to experience warfare in the deployed environment is a method to enabling a better mental foundation for warfare, demonstrated to lower negative psychological responses to killing in this study. Similarly, experience in manned aircraft via an observer or cross-assignment program would also provide an avenue to lower negative disruptive and unresolved psychological responses to remote-killing.

These initiatives have the added benefit of providing RPA aircrew an experience in warfare and manned aviation that would better prepare them to integrate MQ-1/9 aircraft with manned aircraft in a combat environment. It would also greatly aid their understanding of the ground forces, their mission considerations, and the ground environment. As discussed previously, if RPA aircrew are reporting mental disconnection due to lack of interaction and planning with the ground forces, increasing combat deployments among RPA aviators provides a method to address this issue as well.

3) Reprioritize Mental Health Support Requirements

Given the relatively low operational psychologist manning across the RPA community and the data presented in this study depicting the aircrew and specific missions at highest risk for psychological response, the focus of the medical community should be adjusted accordingly. The top three areas recommended for focus are:

1) Missions where friendly forces were exposed to grave danger
2) Missions resulting in near or actual unintended casualties or collateral damage
3) Pipeline and sensor operator first strike

Armed with priority-built focus areas for mental health support, the medical community can adjust its approach to those aircrew expected to be at higher risk for negative psychological responses to killing.

4) Increase Post-Mission Socializing

As Grossman instructs in *On Combat*, a key structure to assisting warriors in dealing with their first kill is a mature, older comrade who stands ready to assist.[3] Veteran warriors are integral in helping younger personnel come to terms with war and taking life and one of the primary avenues for these discussions to occur is post-mission socializing. Unfortunately, post-mission socializing is not common across the MQ-1/9 community.

Given the statistical correlation between lack of socializing and negative psychological impacts due to killing, the operational community should seek ways to increase post-mission socializing among the aircrew and enable these veteran-yearling discussions. Post-mission socializing establishes a much less formal environment than post-mission debriefing, allowing an increase in discussion among all members of the crew and topics of discussion chosen by anyone. This type of socializing may assist some aircrew with mentally processing the mission and the reality of warfare. At a minimum, it provides

[3] Dave Grossman and Loren W. Christensen, *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*. 3rd ed. (Illinois: Warrior Science Pub., 2008), 171.

another opportunity to identify any individuals mentally struggling with the mission before they attempt to transition back to civilian life.

While operational tempo and unit manning present a significant challenge to post-mission socializing, some squadrons have managed to implement this as semi-standard practice. Cross-talk among operational leadership on this issue may prove a useful avenue to copying and implementing 'best practices' from the units that have managed to implement post-mission socializing. Given that the lack of post-mission socializing is primarily driven by low-manning levels and high operational tempo, operational and medical leadership should also use the correlation between psychological issues and lack of post-mission socializing as rationale for increased manning across the MQ-1/9 community.

5) Subsequent Study Focus Areas

As the case discussions demonstrated, extensive time between kills may be encouraging a form of mental complacency among the MQ-1/9 aircrew. Thereafter, rapid transition from intelligence gathering to weapons engagements may not provide adequate time for minds to re-engage on killing as a necessary aspect of their work.[4] In order to better understand this issue, future studies should incorporate mental complacency, or extended time between engagements, as an independent variable for characterization

[4] In chapter eight, Lord Moran provided a useful example of this concept from his time in World War I.

regarding psychological response to killing. Data-gathering on this aspect of operations should also focus on the temporal aspects of the transition between benign missions and weapons engagements.

Additionally, as previously discussed, aircrew age should also be incorporated into future analysis regarding the psychological responses to killing in remote warfare. Subject age was previously identified for this project, but logistical hurdles prevented inclusion.

6) *The Leadership Thread*

Woven throughout the previous recommendations is the focus on leadership and how it impacts individual aircrew charged with the mission of flying and fighting via MQ-1/9. Front-line supervisors through squadron commanders play critical roles in the mentorship, development, and support of MQ-1/9 aircrew charged with killing via RPA.

Leadership engagement is critical to ensure the psychological aspects of killing are covered in the MQ-1/9 Initial Qualification Training (IQT) syllabus. Moreover, during these events, operational leaders should be the ones presenting the majority of the lesson instead of the medical community. Putting leadership front-and-center during psychological training events stresses the importance of the topic as well as reinforces the notion that any aircrew, regardless of rank, duty position, or previous experience, requires preparation and training to kill via RPA. Leadership engagement at this early stage of an aircrew's career would also help remove the stigma of coming forward and self-identifying if individual aircrew later develop issues in their operational squadrons.

Across the operational squadrons, leadership involvement is a critical aspect that both prepares and supports MQ-1/9 aircrew. As Grossman claims, war-veterans (leaders) are the ones to show the way forward to the young aircrew. Front-line supervisors must ensure they are approaching killing with the mentality and mindset required by the squadron commander and set the atmosphere accordingly. Squadron commanders must ensure the atmosphere and culture remains serious and engaged, yet supportive of those who struggle with some aspects of remote combat. More must be done at the squadron level to provide social outlets (decompression time) following a strike, especially ones that include factors shown to increase chances of negative psychological responses such as friendly forces in danger.

Finally, squadron leadership must not be held accountable for these concepts in a vacuum. They require dedicated training as well to learn the best methods to mentor and support subordinates through stressful and traumatic events. This training is truly where the value of an operational psychologist can be best utilized. Instead of trying to support and mentor an entire wing of aircrew (over 1,000 personnel) as individuals, the medical community should shift focus to arming operational leadership with more effective tools to mentor and support aircrew and identify those who may require in-depth assistance.

This method puts boots on the ground across every squadron, every day, instead of waiting and hoping a small group of highly-trained personnel can intercede at the right moment. These moments are happening across the RPA enterprise every single day, and engaged leadership from front-line supervisors through squadron commanders provide the best opportunity to address the topic in a timely and professionally acceptable manner.

External to the RPA community

1) *Engage in public dialogue*

The data in this study clearly demonstrate MQ-1/9 aircrew are mentally engaged in combat, treat their work with a high sense of professionalism, are psychologically impacted by killing, and do not play video games at exorbitant rates. However, much of the contemporary published information and opinion regarding RPA aircrew is contradictory to these findings. If authors such as Calhoun, Coker, and Royakkers provide the sole voice on this topic, the United States public and elected officials are at significant risk to start believing RPA aircrew consist primarily of game-playing, desensitized killers that have no mental grounding for warfare and never give a second thought to killing 'blips' on their computer screen. Commonly held beliefs regarding RPA aircrew also indirectly reflect upon the entirety of the US Air Force and other branches of the armed forces.

The United States places a sacred trust in the armed forces to protect and serve in the best interests of the nation at the direction of civilian leadership. If the United States public believes its military forces are treating warfare as a game instead of a serious instrument of national power, the trust between a nation and its military stands grave risk of erosion. How can a military be trusted if its members give no thought to the taking of human life or consider killing a big video game?

The United States Air Force (USAF) should take proactive steps to address and enter the public discussion regarding RPAs in combat. Important issues such as video-game mentality, desensitization to violence, and inability to comprehend death require the voice of the informed to provide input. Studies such as this provide adequate information to speak objectively on these topics from a fact-based argument that was built on a foundation of academic rigor.

This study, however, is not enough. As Captain Joseph Chapa rightly points out in his article, "Remotely Piloted Aircraft and War in the Public Relations Domain," information regarding RPA operations is rarely available from the USAF.[5] The USAF *institution* needs to address the critiques by the aforementioned authors. This RPA study provides much of the factual material to support a change in perception regarding RPA aircrew. But, based on several years of critiques, articles, and interviews that have supplied ill-informed perceptions regarding the psychology of killing via RPA, a single author professing the opposite is unlikely to completely swing the pendulum of opinion in the opposite direction.[6] A more direct and impactful approach would be for the USAF to weigh in on this topic from its position of experience

---

[5] Joseph O. Chapa, "Remotely Piloted Aircraft and War in the Public Relations Domain," *Air and Space Power Journal* (September - October 2014): 30.

[6] There have been singular voices professing the opposite opinion. Strawser's book, *Killing by Remote Control*, takes a middle-of-the-road approach to the mentality of killing via RPA. Arizona State University professor Nancy Cooke has stated, "When people say this [killing via RPA] is just a video game, nothing could be further from the truth for them. They see the body parts." (See Julie Watson, "Emotional Toll Taxes Military Drone Operators Too, *Washington Times*. September 29, 2014.)

and knowledge based in part on the results of this study. This provides the best chance to properly inform the public and elected leadership on exactly how the military service charged with fighting in winning in the air domain approaches warfare in the 21st century. More importantly, it serves to underpin trust in the larger military as an instrument of national power that approaches each mission with the required sense of professionalism, duty, and gravitas required in a democratic society.

2) *Comparative study between Manned and Unmanned Aircraft*

> For the pilots, war had become almost entirely cerebral, not visceral; it required them to invest little emotional energy into the task at hand. Almost immune from danger, they clocked up the hours in the sky like business executives.[7]
>
> - Christopher Coker

The quote above from *Warrior Geeks* is not another critique regarding the lack of mental engagement of MQ-1/9 pilots. Instead, it describes the mental psyche of B-1 aircrew engaged in the early days of the War on Terror. Interestingly, the quote draws several parallels with the critiques of RPA aircrew despite oft-assumed vast differences between manned and unmanned aircraft.

[7] Christopher Coker, *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War* (New York, NY: Columbia University Press, 2013), 120.

Future research projects on the psychology of killing should consider comparison of MQ-1/9 aircrew and manned aircraft crews. Documenting these differences could provide useful data to help further understand how the character of modern warfare is changing as technology continues to shift the combatants farther away from the point of physical engagement. While this study took the first step by separating aircrew with prior combat and manned-aircraft experience from the Pipeline aircrew, more could certainly be done with this topic. Fighter and bomber aircraft that launch from *within* the combat theater (A-10) and those that more often fly *over-the-horizon* to the combat theater (B-1/B-2) both provide an opportunity for useful comparison to each other and the MQ-1/9.

3) *Think beyond the MQ-1/9*

> War is a social creation. The rules actually observed or violated in this or that time and place are necessarily a complex product, mediated by cultural and religious norms, social structures, formal and informal bargaining between belligerent powers, and so on.[8]
>
> - Michael Walzer

As discussed in chapter one, assailants have been slowly receding from each other for thousands of years. At almost every evolution, mankind has loathed the increased separation between attacker and target, wished for a

[8] Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* (New York, NY: Basic Books, 1977), 43.

return to the 'golden-days of yesteryear,' but eventually overcame moral, ethical, and emotional objections and adopted the new technology based on rational grounds. Thereafter, a new societal standard was established and when the next warfighting evolution occurred, the previously loathed method assumed the mantle of the 'golden-age.' Perhaps no example better illustrates this cycle than the English longbow. Within the span of a few hundred years, the English longbow went from a hated weapon that was cause for removal of archer's fingers to one so ingrained in the English psyche that passionate requests were made to keep the longbow instead of adopting the newfangled musket. Max Boot's observation in *War Made New* seems especially perceptive on this point, "In no profession is the dread of innovation so great as in the army."[9]

In short time we may very well be lamenting of the 'golden-days of yesteryear' where MQ-1/9 pilots actually flew their aircraft with a stick and rudder while sensor operators were required to demonstrate individual skill in maintaining crosshairs on a target. New technology will enable cyber-warfare to a point of computer-clicks resulting in death and destruction that we may never see, never knowing how an enemy was dispatched. Computer printouts will replace the requirement for aircrew to conduct grisly bomb-damage assessments. So-called pilots will press 'go' on their screens and then do nothing more than monitor the aircraft while it executes a mission for hours or

[9] Max Boot, *War Made New: Technology, Warfare, and the Course of History, 1500 to Today* (New York, NY: Gotham Books, 2006), 465.

days, killing dozens in the process. Human beings are kept in, or monitor, the control loop to intercede only if something seems awry.

The technology to make such a leap does not reside in a far-away fantasy land. Much of it is here, awaiting practical application to warfighting machines and their masters. The experiences of MQ-1/9 aircrew have taught us that physical distance should not be the focus of future debates since we have stretched the distance beyond previously thought limits, yet still observed significant mental engagement in warfare among its actors. Instead, we should be focusing our discussion on the automation of warfare with specific emphasis on the identification of valid targets, the decision processes leading to a weapon engagement, and the ultimate responsibility for the taking of human life. The MQ-1 and MQ-9, despite their dizzying array of technological advances in warfare, still adhere to traditional principles of warfare regarding target identification, clearance to engage, and ultimate responsibility for weapons employment. Next-generation combat systems stand ready to automate some, or all, of these processes. The key question remains: *As a society, which facets of war-making are we willing to automate with technology?*

The time for those discussions is at hand that we might make informed and deliberate decisions on how technology assists our ability to make war. We must avoid a repeat of the MQ-1 story where the moral, ethical, and psychological impacts of an evolution in warfare debate began *after* the technology was fielded and had killed hundreds. Arming the MQ-1 in 2001 placed the United States in an uncomfortable position indeed. Consider the ramifications if this study had determined that all RPA aircrew treat warfare like a video game and are completely desensitized to killing. The continued use of such weapons and personnel would place the United States in a morally dubious position. But how would the United States pull these successful machines from the battlespace if they are, in fact, so vital to national security? More importantly, how would the United States explain to the international community that these machines should have never been fielded in the first place? Thankfully, this has not occurred, although the factual data on this topic is emerging over ten years *after* the aircraft were weaponized. We need to engage in deliberate discussion and debate about the future of warfare to ensure the next evolution does not cross the precipice before we are ready for it.

4) *Updates to the Theory of Physical and Technological Distancing*

In 1813 Benjamin Constant lamented the character of warfare, claiming war had lost its glory and had become unnatural due to the distances involved.[10] Two-hundred years later we find ourselves having much the same discussion about remotely piloted aircraft and their applications in 21st century warfare. According to much of the current theory, the aggregate result of

[10] John Nef, *War and Human Progress: An Essay on the Rise of Industrial Civilization* (Cambridge, MA: Harvard University Press, 1950), 337.

distancing across continents via RPA reduces warfare to shooting 'blips on a screen' with no forethought required and no chance of resulting psychological response. The research data collected for this project provides substantial evidence refuting a theory of mindless killing, imploring a theory adjustment to include technology as providing a capability to both *separate* and *connect,* depending on how it is implemented.

In the case of RPA aircrew, viewing their targets through a video screen undoubtedly provides a measure of technological separation. However, this same RPA technology provides aircrew an emotional *connection* to the battlefield that closes the distance between shooter and target. Although this project failed to uncover the exact causal factors driving this change (picture quality and time observing target were specifically investigated), the link is undoubtedly present based on the gathered evidence.

Closing Thoughts

As the longbow overcame the advantages enjoyed by armored knights and steam abruptly ended the quiet solitude of sailing to meet one's enemy on the high-seas, so too does the advent of weaponized RPAs represent a risk to the current hierarchy among warriors and the military bureaucracies that administer them. Indeed, this is an important consideration among warriors and all democratic nations that support the raising of armies for their national defense. But the discussion must remain confound to the realm of factual knowledge and ideas constructed via logical inductive reasoning. Short of this threshold, we risk allowing emotional and bureaucratic influences to permeate the debate, polluting it to the point of nonsense.

In the sense of video games and their comparison to RPAs, this is already occurring. While the public debates the issue back-and-forth, RPA aircrew themselves are so astounded by the absurdity of the topic that most choose to avoid it altogether. At some point, we may find ourselves repeating the same sail-versus-steam argument, but this time in aerial warfare and manned versus unmanned aircraft. Years later we may come to realize that our strong convictions about warfare and weaponry were superseded long ago, but we were blinded by emotion or bureaucracy and failed to recognize the change occurring all around us. Alas, we were content to be left behind to enjoy the remainder of our days in outdated sailing craft. What a wonderful place to spend one's days if the national defense of the United States were not at risk in the decision.

Robert O'Connell describes the development and acquisition of military arms as primarily driven by human motives and considerations. He states, "An air force isn't an air force without manned warplanes."[11] Perhaps this study provides a small measure of paradigm-shifting thought: An air force must be more than the aggregate of its manned aerial assets; perhaps an air force can contain unmanned warplanes and still retain its understanding of warfare, of killing, and retain its warrior ethos. Perhaps.

[11] Robert L. O'Connell, *Of Arms and Men: A History of War, Weapons, and Aggression* (New York, NY: Oxford University Press, 1989), 11.

APPENDIX A.
RPA WEAPONS ENGAGEMENT INTERVIEW

DEMOGRAPHICS.

1. What is your duty position?
2. Hold old are you?
3. What is your rank?
4. Are you married? Kids?
5. How long have you been assigned to MQ-1/9?
6. Do you have military experience prior to MQ-1/9?
    a. Did you deploy in previous military job?
7. How long have you been assigned to current base?
8. ACC, AFSOC, ANG, or other?
9. Do you have a deployment in MQ-1/9? If yes, when?
10. Do you play video games?
    a. First person shooter?
    b. How many hours per week (average over last 3 months) do you play?

COMBAT ENGAGEMENT

1. Have you employed a weapon from the MQ-1/9?
    a. If yes, how many times?
    b. Describe the most recent event(s), or one that sticks out in your mind.

2. Thinking about all your weapon engagements in general, how familiar were you with the target prior to engagement?

3. Were friendlies in danger or taking casualties during, prior, or after any of your engagements? Details?

4. Thinking about your weapons engagement in general, who is the ultimate authority to employ weapons?

5. Thinking about your weapon engagement(s), describe any collateral damage, if any, which resulted.

6. Did your system use High Definition Video for any engagements?
    a. Has your impression changed with high definition video? How does the additional fidelity change your impressions? (Make it more real, etc.)

7. In general, were your weapon engagements conducted for just cause & followed applicable Rules of Engagement (ROE)? (Just Cause is the application of force under national authority that is necessary for national and/or international interests)?

8. Are there any missions where you came close to employing, but didn't, that stick out in your mind? Why?

9. Have you ever opted-out of a shot or mission, or wished you could've opted out?

10. In general, do you conduct a debrief following weapons employment? Describe them

11. In general, do you and/or your squadron gather in the bar, flight room, etc. following a weapon engagement to socialize and discuss the day's events? If so, how often?

12. Do you need to decompress following a typical day? Y / N What have you found to be most helpful to decompress and/or compartmentalize at the end of your work-day?

SOCIAL, COGNITIVE, AND EMOTIONAL RESPONSES

EMOTIONAL

1. Do you remember having an emotional response after your first engagement? If so, can you describe it? You may have experienced more than one emotion. Some examples may include joy, triumphant, surprise, distressed, & reflective.
    a. Can you describe how your feelings may have changed between immediately afterward, 1-2 weeks afterward, and 1-2 months afterward? Does the event still bring up emotion more than a year later?

    b. If you've had multiple engagements, are your immediate emotions different now than your first engagement? If so, describe how they are different.

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

c. Did you feel prepared psychologically for your first engagement?

COGNITIVE

1. Do you view those who've employed and those who haven't employed in different categories? If so, how are these groups different?

2. Have your weapon engagements resulted in you approaching work, and RPA operations specifically, differently? If so, how do you think you've changed since you've engaged?

3. Describe your sense of mission accomplishment following an engagement. Some common responses may be mission completion, sense of helping friendlies, sense of eliminating enemy, sense of a good job done by yourself and squadron.

SOCIAL

1. Have you noticed changes in your social relationships since your weapon engagements? Remember that many people have noticed a change in their social relationships as a result of RPA shift-work, but I am interested in hearing your thoughts on relationship changes since weapons engagements.

2. Has your family, friends, or co-workers stated they noticed a difference in you following weapons engagement? If so, how did they perceive any changes?

ADDITIONAL QUESTIONS

1. Do you feel mentally disconnected due to the distance involved in employing weapons?

2. How have you maintained a sense of realism for what you are seeing on the screen during weapon engagements? How do you prevent it from becoming a video game?
   Stupid Question, Y / N?

3. What do you think about the work you are doing in remotely piloted aircraft? Has your view changed since employing weapons? If so, how? Do you like/love working in RPA?

4. How do you make sense of this type of warfare?

5. Do you feel like you have a warrior ethos? Do you need a warrior ethos to be successful?

6. Is there anything else you'd like to add?

APPENDIX B. Institutional Review Board Approval

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY (AETC)

MEMORANDUM FOR LTCOL JOSEPH L. CAMPO

FROM: HQ AU/CFA

SUBJECT: Protocol F50436-2014-008E Exemption Approved

1. HQ Air University certified Exempt Determination Official considered your protocol, *From a Distance: The Psychology of Killing with Remotely Piloted Aircraft,* for exemption from IRB oversight. The study is approved as exempt in accordance with 32CFR219.101(b) (2). Your AU Control Number for the interview instrument is AU SCN 14-076 which expires 6 Aug 15. Place the following statements at the bottom of your recruitment material: "Approved: F50436-2014-008E". Please note that the USAFA Authorized Institutional Official, HQ USAFA/CV and the Surgeon General's Research Oversight & Compliance Division, AFMSA/SGE-C review all USAFA IRB actions and may amend this decision or identify additional requirements. The Air University's DoD Assurance Number is F50436, expiration date 12 September 2014.

2. Demographic data will be collected, but won't include any personally identifying information. All study participants are currently assigned in an RPA Pilot position and meet all reliability requirements for duty. Any further data collection outside of this population will require additional approvals.

3. If you have any questions please contact the AU POC for Human Research Protection Program (HRPP), Sophie Ryan at 334-953-4166; DSN 493-4166 or sophie.ryan.1@us.af.mil

RYAN.SOPHIE.E A.1175040052

Digitally signed by RYAN.SOPHIE.E A.1175040052
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=RYAN.SOPHIE.E A.1175040052
Date: 2014.08.06 12:39:23 -05'00'

SOPHIE E. A. RYAN, GS-13
HQ AU POC for HRPP
Chief, Institutional Effectiveness

DISTRIBUTION A. APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.

Appendix C
Summary of Key Findings

The Reality of Warfare

- MQ-1/9 aircrew feel mentally engaged in combat despite the vast distances involved.

MQ-1/9 Aircrew Psychological Response to Killing

- MQ-1/9 Aircrew are psychologically impacted by remote-killing. 94 percent of interview respondents reported a first-strike psychological response in the emotional, social, or cognitive domain.

- Aircrew that felt psychologically unprepared to kill were more likely to report negative psychological reactions to their first-kill.

    - Pipeline aircrew (lacking any prior military experience) reported the second highest rate of feeling psychologically unprepared to kill, but the results were statistically insignificant. Direct action in the training program for Pipeline aircrew is likely raising their mental preparation to similar levels of other more-experienced aircrew.

- Aircrew were repeatedly emotionally conflicted with killing. 22 percent that reported a first-strike emotional response reported both positive and negative emotions for the same event.

Man Independent Variables

- Pipeline aircrew, sensor operators, and aircrew lacking prior combat deployment experience all reported trend data and statistically significant increases in negative psychological responses to their first-kill as compared to pilots and more-experienced MQ-1/9 aviators.

- Prior mobility/reconnaissance aircrew reported higher negative rates of psychological responses to killing than prior fighter/bomber pilots and felt more psychologically unprepared to kill than any demographic, including Pipeline aircrew.

Machine Independent Variables

- The addition of High Definition video in the MQ-1/9 community has not resulted in appreciable changes in psychological responses to killing.

Mission Independent Variables

- Tracking a target for a significant period of time prior to killing has not resulted in appreciable changes in psychological responses to killing among MQ-1/9 aircrew.

- Mission-specific events bring the highest chance of psychological response (both positive and negative) to killing.

    - Missions supporting friendly forces in danger reported the highest emotional response rate of any variable analyzed for the study.

    - Aircrew supporting friendly forces in danger or missions with near or actual collateral damage or unintended casualties were three to seven times more likely to experience a negative emotional response than those conducting their first-kill.

Additional Findings

- Approximately 4 percent of aircrew claim to have opted-out of a strike due to aversion with killing. Half of these personnel are covertly manipulating the flying schedule to avoid leadership detection of their aversion.

- Decompression via post-mission socializing was found to have statistically significant impact on negative psychological responses. Aircrew assigned to squadrons that do not typically socialize after a mission are over three times as likely to experience a first-strike negative emotional response as those who do socialize.

- Technology is providing MQ-1/9 aircrew a capability to both emotionally *separate* and *connect* to their combat environment.

- Leadership support to aircrew from front line supervisors through squadron commanders are impacting both the mental preparation for killing and the resulting rationalization and mental processes individual aircrew go through following at least their first kill. Leadership support is critical to the mental well-being of MQ-1/9 aircrew.

Video Game comparisons to MQ-1/9 Aircrew

- RPA aircrew average 2.4 hours of video gaming per week in their personal time

- MQ-1/9 aircrew do not consider operating an RPA akin to playing video games.

Bibliography

Academic Papers

Fitzsimmons, S., K. Sangha. "Killing in High Definition: Combat Stress among Operators of Remotely Piloted Aircraft." University of Limerick. http://www.cpsa-acsp.ca/papers-2013/fitzsimmons.pdf

Wells, Mark Kendall. "Aviators and Air Combat: A Study of the U.S. Eighth Air Force and R.A.F. Bomber Command", (PhD dissertation), July, 1992.

Articles

Anderson, Craig A., Akiko Shibuya, Nobuko Ihori, Edward L. Swing, Brad J. Bushman, Akira Sakamoto, Hannah R. Rothstein, and Muniba Saleem. "Violent Video Game Effects On Aggression, Empathy, And Prosocial Behavior In Eastern And Western Countries: A Meta-analytic Review." *Psychological Bulletin* 136 (2010): 151-73.

Arkin, Ronald C. "The Case for Ethical Autonomy in Unmanned Systems." *Journal of Military Ethics* 9 (2010): 332-41.

Bandura, Albert. "Moral Disengagement In The Perpetration Of Inhumanities," *Personality and Social Psychology Review* 3 (1999): 193-209.

Bar, N. and E. Ben-Ari. "Israeli snipers in the Al-Aqsa intifada: Killing, humanity and lived experience," *Third World Quarterly* 26, No. 1 (2005):133-152.

Bowden, Mark. "The Killing Machines." *The Atlantic*. August 14, 2013. Accessed January 15, 2015. http://www.theatlantic.com/magazine/archive/2013/09/the-killing-machines-how-to-think-about-drones/309434/.

Boyne, Walter J. "How the Predator Grew Teeth," *Air Force Magazine*, July 2009: 42-45.

Brennan-Marquez, Kiel. "A progressive defense of drones". May 24, 2013. http://www.salon.com/2013/05/24/a_progressive_defense_of_drones/

Burger, Jerry M. "Replicating Milgram: Would People Still Obey Today?" *American Psychologist* 64, no. 1-11 (2009): 1-11.

Butterfield, L., W. Borgen, A. Maglio, N. Amundson. "Using the Enhanced Critical Incident Technique in Counselling Psychology Research," *Canadian Journal of Counseling* 43 (2009): 265-282.

Calhoun, Laurie. "The End of Military Virtue," *Peace Review* 23: 377-86.

Chapa, Joseph O. "Remotely Piloted Aircraft and War in the Public Relations Domain," *Air and Space Power Journal* (September - October 2014): 29-46.

Chappelle, W., T. Goodman, L. Reardon, W. Thompson. "An Analysis of post-traumatic stress symptoms in United States Air Force drone operators," *Journal of Anxiety Disorders* 28 (2014): 480-487.

Chappelle, W., K. McDonald, L. Prince, T. Goodman, B.N. Ray-Sannerud and W. Thompson. "Assessment of Occupational Burnout in United States Air Force Predator/Reaper Drone Operators." *Journal of Military Psychology*, October 13, 2014.

Chopko, B.A. "Posttraumatic Distress and Growth: An Empirical Study of Police Officers," *American Journal of Psychotherapy* 64 (2010): 55-72.

Creamer, M., P. Burgess, P. Pattison. "Cognitive Processing in post-trauma reactions: Some Preliminary Findings," *Psychological Medicine* 20 (1990): 597-604.

Detert, James R., Linda Klebe Treviño, and Vicki L. Sweitzer. "Moral Disengagement In Ethical Decision Making: A Study Of Antecedents And Outcomes." *Journal of Applied Psychology* 93 (2008): 374-91.

Fontana, Alan, and Robert Rosenheck. "A Model of War Zone Stressors and Posttraumatic Stress Disorder." *Journal of Traumatic Stress* 12 (1999): 111-26.

Flanagan, John. "The Critical Incident Technique," *Psychological Bulletin* 51 (1954).

Frostling-Henningsson, Maria. "First-Person Shooter Games as a Way of Connecting to People: Brothers in Blood." *CyberPsychology & Behavior* 12: 557-62.

Galliott, Jai C. "Uninhabited Aerial Vehicles And The Asymmetry Objection: A Response To Strawser." *Journal of Military Ethics* 11 (2012): 58-66.

Greitemeyer Tobias. "Intense acts of violence during video game play make daily life aggression appear innocuous: A new mechanism why violent video games increase aggression." *Journal of Experimental Social Psychology* 50 (2014): 52-56.

Griffiths, M. "The Role of Context in Online Gaming Excess and Addiction: Some Case Study Evidence," *International Journal of Mental Health Addiction* 8 (2010): 119-125.

Killmister, Suzy. "Remote Weaponry: The Ethical Implications." *Journal of Applied Philosophy* 25 (2008): 121-33.

Koenen, K., S. Stellman, J. Sommer Jr., and J. Stellman. "Persisting Posttraumatic Stress Disorder Symptoms and their Relationship to Functioning in Vietnam Veterans: A 14-Year Follow-Up," *Journal of Traumatic Stress* 21 (February 2008): 49-57.

Lemmens, J., S. Patti, M. Valkenburg, and J. Peter. "The Effects of Pathological Gaming on Aggressive Behavior." *Journal of Youth and Adolescence* 40, no. 1 (2011): 38-47.

Loo, Robert. “Post-shooting Stress Reactions Among Police Officers,” *Journal of Human Stress* (Spring 1986): 27-31.

Maguen, S., B. Lucenko, M. Reger, G. Gahm, B. Litz, K. Seal, S. Knight, and C. Marmar. “The Impact of Reported Direct and Indirect Killing on Mental Health Symptoms in Iraq War Veterans,” *Journal of Traumatic Stress* 23, No. 1 (February 2010): 86–90.

McCarthy, E. “What are Drones Doing to Us?” *America*, April 2, 2013. http://americamagazine.org/content/all-things/what-are-drones-doing-us

Miller, Laurence. “Officer-Involved Shooting: Reaction Patterns, Response Protocols, and Psychological Intervention Strategies,” *International Journal of Emergency Mental Health* 8 (2006): 239-254.

_____________. “Critical Incident Stress Debriefing for Law Enforcement: Practical Models and Special Applications,” *International Journal of Emergency Mental Health* 8 (2006): 189-201.

Mulrine, Anna. “Unmanned drone attacks and shape-shifting robots: War's remote-control future,” *The Christian Science Monitor,* October 22, 2011. http://www.csmonitor.com/USA/Military/2011/1022/Unmanned-drone-attacks-and-shape-shifting-robots-War-s-remote-control-future

O’Connell, Mary Ellen. “Flying Blind”, *America* 202 (March 15, 2010): 10-14.

Porter, G., V. Starcevic, D. Berle, and P. Fenech. “Recognizing Problem Video Game Use,” *Australian and New Zealand Journal of Psychiatry* 44 (2010): 120-128

Otto, J.L. and B. J. Webber. “Mental Health diagnoses and counseling among pilots of remotely piloted aircraft in the USAF,” *Medical Surveillance Monthly Report* 20 (March 2013): 3-8.

Quarantelli, E.L., R. Dynes, “Response to Social Crisis and Disaster,” *Annual Review of Sociology* (1977): 23-49.

Quintana, Elizabeth. “The Ethics and Legal Implications of Military Unmanned Vehicles,” *Royal United Services Institute for Defence and Security Studies*, 2008.

Royakkers, Lambér and Rinie van Est. “The cubicle warrior: the marionette of digitalized warfare,” *Ethics and Information Technology* 12 (2010): 289–296.

Smith, C., M. Chesnay. “Critical Incident Stress Debriefings for Crisis Management in Post-Traumatic Stress Disorders,” *Medicine and Law* 13 (1994): 185-191.

Snow, B., J. Stellman, S. Stellman, and J. Sommer Jr. “Post-Traumatic Stress Disorder among American Legionnaires in Relation to Combat Experience in Vietnam: Associated and Contributing Factors,” *Environmental*

Research 47 (1988): 175-192.

Swank, Roy, and Walter Marchand. "Combat Neuroses," *Archives of Neurology and Psychiatry*: 236-247.

Swanson, S. "War is no Video Game - Not Even Remotely," *Breaking Defense*, November 18, 2014.

Thomas, J., J. Wilk, L. Riviere, and D. McGurk. "Prevalence of Mental Health Problems and Functional Impairment Among Active Component and National Guard Soldiers 3 and 12 Months Following Combat in Iraq," *Archives of General Psychiatry* 67 (2010):614-623.

Tonkens, Ryan. "The Case Against Robotic Warfare: A Response To Arkin," *Journal of Military Ethics* 11 (2012): 149-68.

Trevino, Linda K., and Stuart A. Youngblood. "Bad Apples In Bad Barrels: A Causal Analysis Of Ethical Decision-making Behavior," *Journal of Applied Psychology* 75 (1990): 378-85.

Watson, Julie. "Emotional Toll Taxes Military Drone Operators Too." *The Washington Times*. September 29, 2014.

Zucchino, David. "Drone Pilots Have a Front-row Seat on War from Half a World Away." *The Los Angeles Times*, February 21, 2010.

Books

Anderson, Clarence E. *To Fly and Fight: Memoirs of a Triple Ace*. Pacifica, CA: Pacifica Press, 1999.

Bandura, Albert. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall, 1986.

Bergin, Kenneth G. *Aviation Medicine; Its Theory and Application*. Bristol, CT: Wright, 1949.

Boot, Max. *War Made New: Technology, Warfare, and the Course of History, 1500 to Today*. New York, NY: Gotham Books, 2006.

Bourke, Joanna. *An Intimate History of Killing: Face-to-face Killing in Twentieth-century Warfare*. New York, NY: Basic Books, 1999.

Brodie, Bernard, and Fawn McKay Brodie. *From Crossbow to H-bomb*. Bloomington, IN: Indiana University Press, 1973.

Clausewitz, Carl Von, and J. J. Graham. *On War*. New York, NY: Taylor & Francis, 2004.

Coker, Christopher. *Waging War without Warriors?: The Changing Culture of Military Conflict*. Boulder, CO.: Lynne Rienner Publishers, 2002.

Coker, Christopher. *Warrior Geeks: How 21st-century Technology Is Changing the Way We Fight and Think about War*. New York, NY: Columbia University Press, 2013.

Craven, Wesley Frank, and James Lea Cate. *The Army Air Forces in World War II*. Volume V. Chicago, IL: University of Chicago Press, 1948.

Creveld, Martin van. *Technology and War: From 2000 B.C. to the Present*. New York, NY: Free Press, 1989.

Creveld, Martin van. *The Transformation of War*. New York, NY: Free Press, 1991.

Dower, John W. *War without Mercy: Race and Power in the Pacific War*. New York, NY: Pantheon Books, 1986.

Ehrhard, Thomas P. *Air Force UAVs: The Secret History*. Arlington, VA: Mitchell Institute Press, 2010.

Gabriel, Richard A. *No More Heroes: Madness and Psychiatry in War*. New York, NY: Hill and Wang, 1987.

George, Alexander L., and Andrew Bennett. *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press, 2005.

Glover, Jonathan. *Humanity: A Moral History of the Twentieth Century*. New Haven, CT: Yale University Press, 2000.

Gray, J. Glenn. *The Warriors: Reflections on Men in Battle*. 2d Harper Torchbook ed. New York, NY: Harper & Row, 1959.

Grinker, Roy R., and John P. Spiegel. *Men under Stress,* Philadelphia, PA: Blakiston, 1945.

Grossman, Dave. *On Killing: The Psychological Cost of Learning to Kill in War and Society*, Boston, MA: Little, Brown, 1995.

Grossman, Dave, and Loren W. Christensen. *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*. 3rd ed. Illinois: Warrior Science Pub., 2008.

Grotius, Hugo, and Francis W. Kelsey. *The Law of War and Peace: De Jure Belli Ac Pacis Libri Tres*. Indianapolis, IN: Bobbs-Merrill, 1925.

Hardy, Robert. *Longbow: A Social and Military History*. New York, NY: Arco Publishing, 1977.

Hastings, Max. *Bomber Command*. New York, NY: Dial Press/J. Wade, 1979.

Holmes, Richard. *Acts of War: The Behavior of Men in Battle*. New York, NY: Free Press, 1985.

Kahn, Paul W. *The Paradox of Riskless Warfare*. Lanham, MD: Rowman & Littlefield, 2003.

Marshall, S. L. A. *Men against Fire; the Problem of Battle Command in Future War.* Washington: Infantry Journal, 1947.

McNeill, William Hardy. *The Pursuit of Power: Technology, Armed Force, and Society since A.D. 1000*. Chicago, IL: University of Chicago Press, 1982.

Milgram, Norman A. *Stress and Coping in Time of War: Generalizations from the Israeli Experience*. New York, NY: Brunner/Mazel, 1986.

Milgram, Stanley. *Obedience to Authority: An Experimental View*. New York, NY: Harper & Row, 1974.

Moran, Charles McMoran Wilson. *The Anatomy of Courage*. Boston, MA: Houghton Mifflin, 1967.

Nadelson, Theodore. *Trained to Kill: Soldiers at War*. Baltimore, MD.: Johns Hopkins University Press, 2005.

Nef, John U. *War and Human Progress: An Essay on the Rise of Industrial Civilization.* Cambridge, MA: Harvard University Press, 1950.

O'Connell, Robert L. *Of Arms and Men: A History of War, Weapons, and Aggression*. New York, NY: Oxford University Press, 1989.

Orwell, George. *My Country Right or Left 1940-1943: The Collected Essays Journalism & Letters of George Orwell (Collected Essays, Journalism and Letters George Orwell).* Boston, MA: Nonpareil Books, 2000.

Peebles, Curtis. *Dark Eagles: A History of Top Secret U.S. Aircraft Programs*. Novato, CA: Presidio, 1995.

Picq, Charles Jean Jacques Joseph, and John Nesmith Greely. *Battle Studies; Ancient and Modern Battle,* Harrisburg, PA.: Military Service Publication., 1947.

Shalit, Ben. *The Psychology of Conflict and Combat*. New York, NY: Praeger, 1988.

Sherman, Nancy. *The Untold War: Inside the Hearts, Minds, and Souls of Our Soldiers*. New York, NY: W.W. Norton, 2010.

Singer, Charles. *A History of Technology*. Oxford: Clarendon Press., 1956.

Strawser, Bradley J. *Killing by Remote Control: The Ethics of an Unmanned Military*, New York, NY: Oxford University Press, 2013.

Tarn, W. W. *Hellenistic Warfare and Naval Developments*. Cambridge, MA: Cambridge University Press, 1930.

Turner, Jonathan H., and Jan E. Stets. *The Sociology of Emotions*. Cambridge, UK: Cambridge University Press, 2005.

Turner, Jonathan H. *Human Emotions: A Sociological Theory*. London, UK: Routledge, 2007.

Walzer, Michael. *Just and Unjust Wars: A Moral Argument with Historical Illustrations*. New York, NY: Basic Books, 1977.

Walzer, Michael. *Arguing about War*. New Haven, CT: Yale University Press, 2004.

Wells, Mark K. *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*. New York, NY: Routledge, 1995.

Whetham, David. *Ethics, Law and Military Operations*. New York, NY: Palgrave Macmillan, 2010.

Yenne, Bill. *Attack of the Drones: A History of Unmanned Aerial Combat*.

St.Paul, MN: MBI Publishing, 2004.

Zaloga, Steve, and Ian Palmer. *Unmanned Aerial Vehicles: Robotic Air Warfare, 1917-2007*. Oxford, UK: Osprey, 2008.

Briefings/Point Papers/Memos/Messages

432nd Wing. Mission Export Brief, PowerPoint presentation, January 2014.

Chappelle, W. "2012 Occupational Health Stress Screenings with USAF RPA Units - Supplemental Analysis." PowerPoint Briefing, 2012.

Haskell, J. "Psychology of Remote Combat," PowerPoint Briefing, 2014.

Haskell, J. "Warrior Mindset," PowerPoint Briefing, 2014.

Headquarters US Air Force (AF/A2CU), RPA Task Force, "RPA Fast Facts," 1 February 2011.

Government Documents

Headquarters United States Air Force. *United States Air Force RPA Vector: Vision and Enabling Concepts 2013-2038*, February 17, 2014.

Interviews/E-mails/Speeches

Haskell, Jeremy, 432 Wing Operational Psychologist, Creech Air Force Base, Nevada, email to author, October 2, 2014.

Hines, Ken. "Good and Bad Questions About Drones in Warfare" (lecture, *Drones In Focus Conference*, Boston College), November 15, 2014.

Hoehn, Mark 49th Operations Group Commander, interview with author, September 15, 2014.

Lewis, Michael, Headquarters United States Air Force, AF/A3O, email to author, October 3, 2014.

Ortega, H. "Combat Stress in Remotely Pilots/UAS Operations," (interview, *The Brookings Institution*, February 3, 2012).

Roosevelt, Franklin D. "Annual Message to Congress on the State of the Union," January 6, 1941.

Manuals, Instructions, Directives, and Other Publications

Technical Order (TO) 1Q-1(M)B-1, MQ-1B and RQ-1B Flight Manual, Change 11, 14 Jan 2008.

Reports

The 9/11 Commission. *Final report of the National Commission on Terrorist Attacks upon the United States*, Washington, D.C.: US Government Printing Office, 2004.

Army Medical Command, Office of the Surgeon General. *Mental Health Advisory Team (MHAT) V Operation Iraqi Freedom 06-08*, February 14, 2008.

Historical Studies Branch, USAF Historical Division. *Combat Crew Rotation: World War II and Korean War*. Maxwell Air Force Base, Alabama, January 1968.

Chappelle W, A. Salinas, K. McDonald. *Psychological health screening of USAF remotely piloted aircraft (RPA) operators and supporting units.* Paper presented at the Symposium on Mental Health and Well-Being Across the Military Spectrum, Bergen, Norway, April 2011. http://ftp.rta.nato.int/public/PubFullText/RTO/MP/RTO-MP-HFM-205/MP-HFM-205-19.doc

Chappelle, W., K. McDonald, and K. McMillan. *Important and critical psychological attributes of MQ-1 Predator and MQ-9 Reaper pilots according to subject matter experts*. Wright-Patterson AFB, OH: U.S. Air Force School of Aerospace Medicine, 2011.

Chappelle, W., K. McDonald, B. Thompson, and J. Swearengen. *Prevalence of high emotional distress and symptoms of post-traumatic stress disorder in U.S. Air Force active duty remotely piloted aircraft operators (2010 USAFSAM survey results)*. Wright-Patterson AFB, OH: U.S. Air Force School of Aerospace Medicine, 2012.

Chappelle, W., and K. McDonald. A*ssessment of Occupational Burnout in United States Air Force Predator/Reaper Remotely Piloted Aircraft "Drone" Operators.* (unpublished draft manuscript).

_____________. *Symptoms of Psychological Distress and Post-Traumatic Stress Disorder in United States Air Force "Drone" Operators* (unpublished draft manuscript).

Fisher, C. *Telewarfare and Military Medicine*, Air Force Medical Support Agency, September 30, 2011. http://www.sg.af.mil/shared/media/document/AFD-120306-017.pdf

Kulka, R., W. Schlenger,, J. Fairbank, R. Hough, B. Jordan, C. Marmar, D. Weiss. *Contractual Report of Findings from the National Vietnam Veterans Readjustment Study*, November 7, 1988.

Lenhart, A., S. Jones, A. Macgill, "Adults and Video Games," *Pew Internet and American Life Project,* December 7, 2008.

Michael R. Thirtle, Robert V. Johnson, John Birkler, *The Predator ACTD: A Case Study for Transition Planning to the Formal Acquisition Process* (Santa Monica, CA:RAND, 1997).

Ouma, J., W. Chappelle, and A. Salinas. *Facets of occupational burnout among U.S. Air Force active duty and National Guard/Reserve MQ-1 Predator and MQ-9 Reaper operators,* Wright-Patterson AFB, OH: U.S. Air Force School of Aerospace Medicine. 2011.

United Nations General Assembly, Fourteenth session, Human Rights Council. *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions,* prepared by Philip Alston, May 28, 2010.

U.S. Army, Office of the Surgeon General. *Medical Statistics in World War II*, U.S. Government Printing Office, 1976.

U.S. Forces Afghanistan, Office of the Command Surgeon. *Mental Health Advisory Team (MHAT) 6, Operation Enduring Freedom 2009, Afghanistan*, November 6, 2009.

Web content

General Atomics Aeronautical Systems MQ-9 Reaper, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=16040

MQ-1 Predator http://www.af.mil/information/factsheets/factsheet.asp?id=122