THE DISTANCE PARADOX: REAPER, THE HUMAN DIMENSION OF REMOTE WARFARE, AND FUTURE CHALLENGES FOR THE RAF

By Dr Peter Lee

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Abstract: Since the advent of air power more than a century ago, the relationship between shooter and target has been characterised by steadily increasing physical and psychological distance. The advent of remotely piloted air operations in the twenty-first century, such as those conducted using the MQ-9 Reaper, produces a distance paradox: the physical distance of the crews from operational theatres now extends across continents, while the visual, emotional and psychological distance to their targets has regressed to that experienced by First World War aircrew. This paper reflects on key human aspects of remote air operations through the experiences of Reaper personnel, linking current challenges to historical precedent, and identifying future challenges that will need to be addressed to optimise performance and resilience in the decades to come.

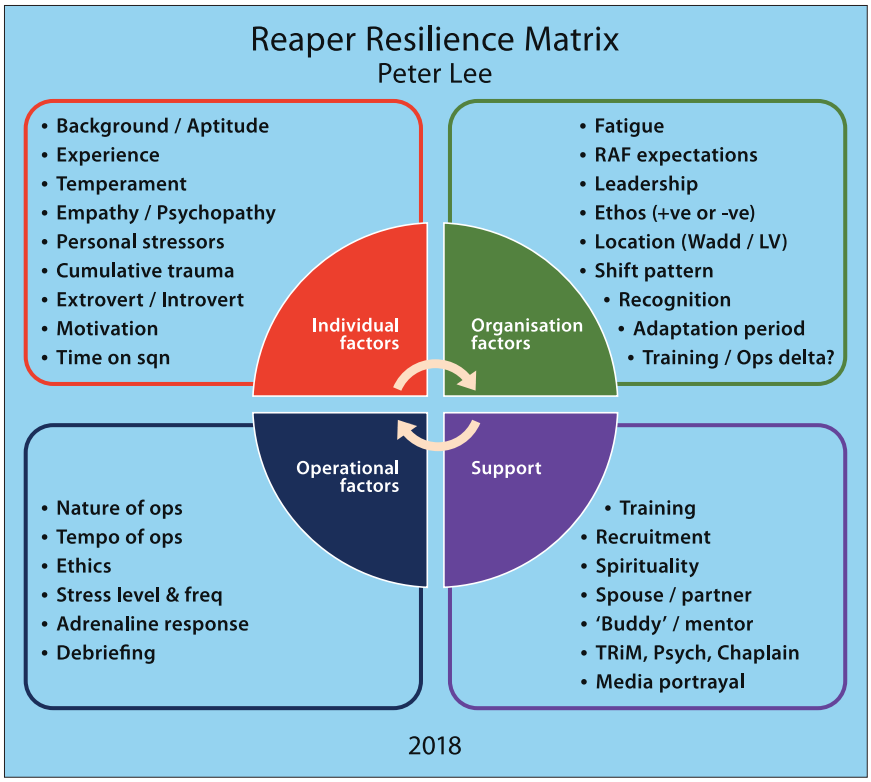
RAF MQ-9A Reaper, 2014. © Crown Copyright.

INTRODUCTION[1]

In the final decade of the Royal Air Force's first hundred years of existence, the addition of the MQ-9A Reaper to its inventory has brought both operational benefits[2] and public controversy.[3] In 2007 the Reaper was introduced as an Urgent Operational Requirement for Operation Herrick in Afghanistan.[4] By 2014, the Reaper's dual Intelligence, Surveillance and Reconnaissance (ISR) and Attack capabilities had proved to be so effective and indispensable that it was brought into RAF Core Capability.[5] To staff this new capability, personnel were brought together from a range of flying backgrounds – including the Harrier, Tornado F3 and GR4, Nimrod, Hercules, and various helicopters – and none. Individuals were drawn from the RAF, Royal Navy, Army and Royal Marines, to develop and apply the Reaper's ability to remotely deliver air power effect in counter-insurgency operations, initially in Afghanistan and latterly in Iraq and Syria. The disparate backgrounds and experiences of Reaper personnel have resulted in squadron cultures that have often reflected the dominant previous experiences and personal ethos of those involved.

The purpose of this paper is to reflect on key aspects of the human operator dimension of remote air operations through the experiences of Reaper personnel, linking current challenges to historical precedent, and identifying future challenges that will need to be addressed to optimise performance and resilience in the decades to come as the Reaper is eventually succeeded by the Protector.[6] This article forms part of a wider study entitled, 'Royal Air Force Reaper: 21st Century Air Warfare from the Operators' Perspective',[7] the major output of which was a book entitled *Reaper Force: Inside*

Britain's Drone Wars.[8] Empirical, qualitative data was collected between July 2016 and February 2018, and comprises observational field research with 13 and 39 Squadrons and 90 semi-structured interviews with members of the RAF Reaper community.[9] In the course of the data gathering, recurring factors that could contribute to sustained, long-term participation in operations, otherwise referred to as 'resilience', were identified. From this coding of notes and observations emerged the following Reaper Resilience Matrix:



There is not the scope within this paper to address every element of this matrix. However, several of the factors identified here will be explored below to understand some current and future challenges in the human dimension of RAF remotely piloted air operations.

The first section will provide a brief historical overview showing how physical and psychological distance in weapon use by air, land and maritime forces increased in tandem over time.[10] Snipers, special forces, fast jet crews, intelligence personnel and others have experienced elements of this dynamic. However, this study focuses on remotely piloted aircraft and their crews: a point raised by Killeen and Jordan in 2013

and expanded upon here.[11] The subsequent sections will consider the potential effects of this visual intimacy and the re-humanising of targets on operators, introducing physical, emotional and psychological responses. The final section will pose questions about the costs and benefits of empathy with human targets, before a discussion about moral injury and the extent to which the previous factors might contribute to its occurrence or prevention.

AIR POWER, DISTANCE, AND KILLING

For the first 90 years of the RAF's existence, from its creation on 1 April 1918 to the advent of the Reaper MQ-9A and the formation of 39 Squadron in 2007, the trajectory of the relationship between shooter and target in the delivery of air power has been characterised by steadily increasing physical and psychological distance. Part of the psychological distancing is, for psychologist Albert Bandura, the use of 'euphemism' in what he sees as the mechanism of moral disengagement by military drone operators: 'Euphemistic language in its sanitising and convoluted forms cloaks harmful behaviour in innocuous language and removes humanity from it'.[12] His notion of 'harmful behaviour' seems to extend to all killing, including strikes against legitimate combatants which might save other lives on the ground. He refers to some of the euphemistic terminology used in the US drone community: 'touchdowns… jackpots…personality strikes…signature strikes', as well as 'collateral damage' (the unintended, accidental or indirect killing of civilians), the latter also being used by RAF Reaper personnel.[13] Bandura's argument about the use of euphemism is, to a significant extent, echoed in the empirical research with military veterans conducted by Grossman.[14] The practical result of the use of euphemistic language is to provide emotional distance between the shooter and the human target.

The reason for this use of euphemism in the delivery of air power, or in any other element of killing in war or armed conflict, is to help facilitate an activity – killing – that is difficult for even many hardened military personnel. Grossman points out that 'there is within most men [and women] an intense resistance to killing their fellow man [or woman]', going on to observe that 'throughout history the majority of men on the battlefield would not attempt to kill the enemy, even to save their own lives or the lives of their friends'.[15] In his study, he presents evidence to demonstrate that only a small minority of combatants – throughout history and up to the present – are comfortable, or at ease, with killing, even in a life-threatening wartime scenario: 'The burden of killing is so great that most men try not to admit that they have killed. They deny it to others, and they try to deny it to themselves'.[16]

That trajectory of increasing distance in the air power 'killing' domain even precedes the RAF, starting with the Royal Flying Corps and Royal Naval Air Service in the First World War. The recollections of Major James McCudden VC provide a good indication of the distances involved in air-to-air combat a century ago. On 13 January 1918 he was flying

behind enemy lines at 17,000 feet when he spotted a two-seater enemy aircraft a few thousand feet below.[17] He idled his engine and, almost silently, glided down behind his unsuspecting target at 9,000 feet:

> [W]hen I got within good close range, about 100 yards, I pressed both triggers; my two guns responded well, and I saw pieces of three-ply wood fall off the side of the Hun's fuselage. Then the L.V.G. went into a flat, right-hand spiral glide until it hit the ground a mass of flying wreckage … I hate to shoot the Hun down without him seeing me, for although this method is in accordance with my doctrine, it is against what little sporting instincts I have left.[18]

Two separate indicators of distance are captured in these few words: physical distance and psychological distance. At the time of firing, McCudden was about 100 yards physically distant from the German aircraft he shot down. Then, afterwards, he watched the downed enemy aircraft hit the ground. Assuming that McCudden maintained his altitude at 9,000 feet, to give him an advantage in any subsequent air-to-air encounter, he would be watching from almost 3,000 metres vertically away from the crash site. In addition, psychological distance is indicated in two ways. First, he refers euphemistically to 'the Hun', rather than the 'pilot' or 'crew' or 'people'; and second, he describes 'a mass of flying wreckage', focusing on what happened to the aircraft rather than on the deaths of the crew. A few days later, after shooting down another German aircraft, McCudden described:

> This D.F.W crew deserved to die, because they had no notion whatever of how to defend themselves, which showed that during their training they must have been slack, and lazy, and probably liked going to Berlin too often instead of sticking to their training and learning as much as they could while they had the opportunity. I had no sympathy for those fellows, and that is the mental estimate which I formed of them while flying back to my aerodrome to report the destruction of my 43rd aerial victim.[19]

In this description, McCudden reduces the humanity of the crew he shot down, discursively imagining a pairing who 'deserved to die' for being 'slack', 'lazy' and too keen on having a good time in Berlin rather than training properly. One possible alternative explanation for McCudden's choice of words is that he was justifying their killing *to himself* on some psychological level and avoiding a possible alternative explanation: inexperienced crew with little or no chance against one of the RFC's – later RAF's – most effective pilots.

By the Second World War and afterwards, the dynamic of killing from the air had moved on considerably. That increasing physical distance, and accompanying sanitizing language, can be seen in Group Captain Leonard Cheshire's recollections from a

bombing raid against Cologne: 'If what we saw below was true, Cologne was destroyed... Cologne was burning, it was burning as no city in the world can ever have burnt, and with it was burning the morale of the German citizen'.[20] There was no possibility of seeing individuals from his bombing altitude even as Cheshire referred to the burning city below. His reference was to the burning of the *morale* of the German citizen and not to the burning of the German citizens themselves. Cheshire's use of language was consistent with the language of the official bombing directives issued to Bomber Command in the Second World War. A directive on 14 February 1942 to Acting Air Officer Commanding-in-Chief (AOC-in-C) Bomber Command, J.E.A. Baldwin stated: 'the primary object of your operations should now be focussed on the morale of the enemy civilian population and in particular, of the industrial workers'.[21] The directive does not demand that civilians themselves are targeted, merely that their *morale* is undermined, through the bombing (including incendiaries) of their homes and neighbourhoods in the way that Cheshire observed. Garret argues that the Air Ministry maintained 'and sustained [a] public fiction about Bomber Command's strategy' through vague references to undermining morale.[22] In October 1943 Arthur Harris, AOC-in-C, Bomber Command, encouraged greater candour about the reality of bombing and urged the Air Ministry to 'stop their public denials that the bombing campaign was focused on "the obliteration of German cities and their inhabitants as such".'[23] The use of language to either describe or obscure the activities and aims of Bomber Command was a point of sustained debate until the end of the war.

Over the same period, American political and military leaders similarly sought to deploy language in a way that presented their actions more favourably to the public. Hays Parks points out that there was little evidence that the USAAF was more accurate with its ''precision', 'pickle barrel', and 'pin-point' bombing' than the RAF's area offensive being conducted against Germany at the time.[24] There is, however, evidence of two things that the British and Americans had in common in their respective bombing campaigns. First, bombing altitudes were getting higher (25,000 feet),[25] thereby increasing the physical distance of the bomber crews from those they killed beyond that experienced by First World War aircrew. Second, the use of sanitising language, like 'area bombing', 'morale bombing', or 'carpet bombing', psychologically protected those involved from confronting the stark reality of killing civilians over entire city areas.[26] The use of language was a factor in emotionally distancing political leaders, military commanders and bomber crews – and the general public – from the 'killing' aspect of the bombing policies they undertook.

In the decades following the Second World War, the distances involved in the delivery of air power – especially air-to-ground attacks – continued to increase. In parallel, aircraft got faster and bombing runs took correspondingly less time. By 2003, the RAF had acquired the Storm Shadow stand-off cruise missile for use in Operation Telic. It could be fired from more than 500km away, typically against command and control

centres, airfields, communications hubs, ammunition storage and other key targets.[27] The Storm Shadow would officially enter RAF service in 2004, increasing the distance between aircrew and target – its 'fire and forget' pre-programmed capability providing parallel psychological distance from targets for those involved. At the same time, the US Predator remotely piloted aircraft programme was rapidly expanding – with embedded RAF personnel involved – placing aircrew thousands of miles away from not only their targets but from their aircraft as well. Then in 2007, the RAF re-formed 39 Squadron with the MQ-9A Reaper, officially joining the era of remotely piloted air operations.[28] The distance between shooter and target would appear to have reached new levels.

REAPER AND THE DISTANCE PARADOX

A sensor operator at a Reaper work station. © Crown copyright.

A number of now-familiar tropes emerged in the 2000s in popular and academic critiques of military drones like the Reaper. The 'Playstation mentality' meme is probably the best known of those representations of Reaper crews, with the claim that 'geographical and psychological distance between the drone operator and the target lowers the threshold in regard to launching an attack…Operators, rather than seeing human beings, perceive mere blips on a screen'.[29] Singer, similarly, argued that drone crews are 'disconnected' from the wars in which they conduct air operations.[30] Further, Olsthoorn referred to both the psychological and physical distance from their targets, as though the two are directly linked,[31] while Medea perpetuated the assumption that killing by drone strike from afar was somehow 'easier' than

conventional military killing.[32] These authors all appear to have assumed that the historical link between physical and psychological distance continued with US and UK remotely piloted air operations using the Predator and the Reaper. Further, limited primary research restricted authors' understanding of the acuity of the images that could be seen on the screens, and hence the mentally immersive nature of such operations. In contrast, in 2014, a report by the House of Commons Defence Committee acknowledged the All Party Parliamentary Group on Drones' concerns about the 'limited consideration of the psychological impact of drones *on operators* and those living in affected areas'.[33] However, public focus, and academic and media enquiry, concentrated on policy surrounding RPAS use and on those in affected areas, rather than on the operators.[34]

However, over that same period, the impact of remote operations – especially killing – on the crews who carry them out, has quietly but steadily grown as an area of interest and enquiry. In 2013, American former Predator pilot Brandon Bryant publicly shared his diagnosis of PTSD, becoming something of a *cause célèbre* in describing multiple kills – with apparent scant regard for the deaths of civilians – and the extremes of behaviour that he experienced outside the Ground Control Station.[35] More recently, USAF Imagery Analysts have been reported as experiencing varying degrees of mental trauma, and 'nearly one in five had witnessed a rape within the past year. Some airmen reported witnessing more than 100 incidents of rape or torture' according to USAF Wing Surgeon Lieutenant Colonel Cameron Thurman.[36] Then on 13 June 2018, the New York Times published a major investigative piece on the mental trauma experienced by US drone crews, asking whether some or all of these individuals could be suffering from 'moral injury'?[37] 'Moral injury' will be discussed below but an initial sense of this contested term is found in Nash et al's definition, which refers to '...changes in biological, psychological, social, or spiritual functioning resulting from witnessing or perpetrating acts or failures to act that transgress deeply held, communally shared moral beliefs and expectations'.[38]

Against this backdrop, the distance paradox experienced by Reaper personnel emerged right away in my research interviews, in their descriptions of events they had witnessed on the ground via the sensor suite on the aircraft. They were physically located at either Creech Air Force Base in Nevada or at RAF Waddington in Lincolnshire. Aircraft crews had never been so geographically far away from their targets, yet they witnessed and experienced events on the ground in great detail. In addition, those events were juxtaposed with the banalities of day-to-day family life:

> I am a parent governor for my local school and every year I volunteer to go away with the teaching staff and help the kids enjoy the great outdoors. It's only three days away but the kids get to abseil, canoe, pot-hole and do many other fun things. One year, I had a great time and thoroughly enjoyed the company of the

> children and the staff. Eighteen hours after I got back I was in work, watching a prisoner having his head cut off and being powerless to do anything about it. Oh how my life had changed – and not for the better – in such a short period of time! (Simmo – Sensor Operator)[39]

Comments like this and many others made it clear, subsequently reinforced over time, that the incidents which had the greatest impact on the Reaper crew members – not surprisingly – revolved around killing or serious physical harm. These either involved their own use of weapons and killing (or seriously harming) enemies on the ground, or having to watch as atrocities (including beheadings or other executions) were perpetrated, while powerless to intervene. At maximum camera resolution, the view the Reaper crews have of these events is now not much different to the 100 yards or so distance between aerial combatants in the First World War described previously. More significant is that First World War aircrew who shot down enemy aircraft were visually further away when the target aircraft crashed on the ground than are observers of a Reaper Full Motion Video (FMV) feed today.

Blair and House say of this phenomenon in remote air operations: 'We hold that the operative distance is not physical distance, but cognitive distance. For remote warriors, *Cognitive Combat Intimacy (CCI) is a relational attachment to a human target mediated by sensor resolution and dwell time, or duration of observation*.'[40] This concept of Cognitive Combat Injury has both advantages and disadvantages. Positively, it recognises the mental engagement of the Reaper pilot, sensor operator and mission intelligence coordinator. It also encapsulates the cognitive intimacy of the authorising officer and senior mission intelligence coordinator, imagery analysts in intelligence agencies, and commanders with a live video feed. Potentially more negatively, that intimacy is somewhat removed from the constant distance-intimacy paradox at the heart of remote warfare. The paradox itself is a factor in creating, for some, a cognitive dissonance between the physical distance and safety enjoyed by the Reaper crew, and the emotional intimacy and psychological threat. In the example of 'Simmo' above, his physical distance from a war zone enabled him to pursue relaxing educational and family activities as a school governor, while on his return to work the Reaper Full Motion Video feed brought him great visual and psychological intimacy with a beheading victim.

Grossman observes that 'During strategic bombing [in the Second World War] the pilots and bombardiers were protected by distance and could deny to themselves that they were attempting to kill any specific individual'.[41] Geographical distance and the security of a Ground Control Station provide the ultimate physical protection for Reaper crew members. However, the clarity and persistence of the close-up views they see do not afford them the denial and psychological protection that Grossman argues the bomber crews experienced in the Second World War. Crucially, significant time and effort goes

into ensuring that *specific, identified individuals* are killed. Days, weeks and even months have gone into observing particular High Value Targets in Afghanistan, Iraq and Syria.

Historically, an important means of enabling the killing of enemies is through psychological distancing and dehumanisation, and there is an extensive literature on the phenomenon. At the extreme end of this 'dehumanising' spectrum are atrocities against the Jews in the Second World War, which 'originates from the delegitimization of the Jews by the Nazi regime',[42] and the Cambodian genocide in the 1970s. Mass killing of innocents – or non-combatants, to use a less loaded term – requires a high degree of dehumanisation which strips the victim of self-hood, identity, culture and intrinsic value.[43]

In his use of language, McCudden's words (quoted earlier in this paper) conform to a pattern of behaviour and use of language in relation to killing in war. Bandura states: 'By camouflaging pernicious activities in innocent or sanitizing parlance, the activities lose much of their repugnancy. Soldiers "waste" people rather than kill them'.[44] Hence, a century ago McCudden described watching the German L.V.G. aircraft going into a spin and crashing, rather than write about killing the crew. Further, 'Self-censure for cruel conduct can be disengaged by stripping people of human qualities... They are portrayed as mindless "savages," "gooks," and other despicable wretches'.[45] Or, in McCudden's case – consistent with the language and attitudes in that particular war at that time – he shot down 'the Hun'.

If it is even partially correct that combatants have previously dehumanised their enemies in order to kill them, the approach often breaks down with the visual intimacy of killing from a Reaper. One Reaper pilot – a highly experienced former fast jet pilot – describes some of the dynamics involved in the humanising of a potential target, and the visual and psychological intimacy it entails:

> [W]e may watch 'Target A' for weeks, building up a pattern of life for the individual: know exactly what time he eats his meals; drives to the Mosque; or uses the ablutions – outdoors of course! This is all-important for the guys on the ground. However, what we also see is the individual interacting with his family – playing with his kids and helping his wife around the compound. When a strike goes in, we stay on station and see the reactions of the wife and kids when the body is brought to them. You see someone fall to the floor and sob so hard their body is convulsing. A conventional aircraft often doesn't have the endurance [in the air] to witness this.[46]

The level of visual detail afforded the Reaper crew, and the sustained surveillance involved in this example, does not allow the individuals involved to deny that the enemy has a family, or a fully rounded life. If part of that life is devoted to insurgency

warfare, then it is viewed in a broader context. Those involved not only see the actual killing in detail, they also see the immediate consequences: recovery of a body or body parts, family reactions, funerals, and so on. Such potentially traumatic visual stimuli is not unique to the Reaper Force but there is not the scope here to explore the similar experiences of online sex-crime police investigators, war photographers, defence intelligence analysts, or Facebook and YouTube online moderators.

POTENTIAL IMPACTS OF REMOTE WARFARE

If Bandura is correct, the visual and emotional intimacy of Reaper operations will bring its own psychological challenges because it is 'difficult to mistreat humanized persons without suffering personal distress and self-condemnation'.[47] Before accepting his argument, however, the word 'mistreat' should be qualified. In the context of military operations, it may be the case that killing another human being is an appropriate operational and ethical act that can result in personal and professional satisfaction. Such a response does not preclude the possibility of sadness or regret that a child may have been left without a parent who happened to be an enemy combatant. Responses to the taking of life in war are complex and individualised. Having spent so much time with so many Reaper personnel, whose responses to conducting remote operations ranged from apparently unaffected to significantly affected – with the majority somewhere in between – a new question emerged: ***Why are some crew members able to operate for five, six, even seven years consecutively, while others seem exhausted after two?*** I will go as far to suggest that the answer to this question – and only the beginning of an answer is offered in this paper – will shape the human dimension of remote air operations, and therefore the culture of the RAF itself, long into the future.

The most consistent response to how long a Reaper crew member could or should operate without an extended break, came in the interviews with spouses and partners: somewhere between two-and-a-half and three years.[48] Vet 18, a former Reaper Squadron Commander, had reflected on this question for years and concluded that, although the answer would always be individualised, 'None will *happily* make it to the end of two tours.'[49] Underpinning almost every discussion with operators and spouses/partners about longevity on the Reaper Force was fatigue: a constant tiredness that was rooted in long days on a 'six days on, three days off' work pattern that rarely worked out so neatly or generously. 'He's tired *all* the time,' says Partner 20, a phrase that is repeated so often during interviews it could be the unofficial Reaper Force motto. But in the background of the 'fatigue' discussions, a common link to operations and weapon use also emerged – especially where human targets were involved. Partner 19 tried to explain his wife almost collapsing, in tears, onto the floor when she got home after an extended, intense period of Reaper activity: 'I put it partly down to exhaustion and partly down to the operation she was conducting that day.' Partner 12 echoed those sentiments, while also explaining the reason her husband persevered: 'the physical impact on his body, lack of sleep, constant mental exhaustion – just not getting "down

time". That's what I worried about most. But I don't think he thought about doing anything else – that was just his job.' The role itself, for the vast majority of Reaper personnel, is as professionally and personally fulfilling as it is demanding.

SHOOTING, KILLING AND PHYSICAL RESPONSE

The physiological effects of conducting lethal missile or bomb strikes is one area where the experiences of Reaper crew members consistently contradict public claims that they are somehow emotionally distant, remote game-players. Almost all crew members described adrenaline spikes – sometimes almost overwhelmingly powerful – and rapid heart-rates in the build-up to, and execution of, a weapon strike, though for some these lessened over time. In July 2016 I observed my first lethal missile strike in real time in a 39 Squadron Ground Control Station, while sitting immediately behind the sensor operator as he guided a Hellfire missile onto his human target: an ISIS fighter on a motorbike. As the missile struck, hitting and killing the target, the sensor operator – who had been holding his breath for the half-minute duration of the missile flight – exhaled with relief and exclaimed: 'My heart's beating out of my chest!'[50] That link between heart-rate, adrenaline spike and weapon firing is highly prevalent among crew members, and can be especially tense for those new to shooting and killing.

Jeff, an RPAS(P),[51] was building up to his first missile strike, just a couple of days after he had qualified as Combat Ready: 'My heart has never gone so fast. I've done a lot of silly things in my time that has raised my heart rate quite considerably, but not like this.' However, actual weapon firing – depending on the operational environment, Rules of Engagement, and proximity of non-combatants – might only happen once for every five or six times the pilot starts the process of getting all the authorisations for a strike, or is called in for a potential strike. For most crew members, just beginning the process prompts a spike in adrenaline. Ross gives a detailed insight and adds a further dimension to the personal dynamics in a weapon strike:

> [W]hen you've had a 'decent' strike event you go through a process of extreme adrenaline. It gets to a peak…you ride the crest, the strike happens, then you come down as the adrenaline subsides. The occasions when a strike doesn't happen – maybe because there are civilians around – is what causes you issues. When you have to leave a threat out there to cause harm or kill people. You don't get that kind of pressure release.[52]

That fight-or-flight arousal seems counter-intuitive because the Reaper crews themselves are not in physical danger. However, it is prompted because they also know that in many situations, if they are not absolutely precise with their shots, non-combatants or allied forces on the ground, or both, will die. Compounding that pressure is the awareness that multiple audiences are watching in real time, from the Operations Room on the Squadron, to the CAOC in Qatar, to other intelligence agencies who are

gathering (or providing) information. Vet15 describes being very aware – during lethal weapon events – of the current and subsequent audience: 'lots of people are watching what's going on. You can't hide things because they are visible to people who have the access to the [live video feed of the incident] you are dealing with'.[53]

Experimental psychologists have studied – and continue to study – human performance under pressure. Beilock and Carr offer an insight into how 'audience awareness' might affect performance: 'Distraction-based accounts of suboptimal performance propose that performance pressure shifts attentional focus to task-irrelevant cues—such as worries about the situation and its consequences. In essence, this shift of focus changes what was single-task performance into a dual-task situation'.[54] Knowing that under the well-intended squadron and RAF culture of learning from one another's mistakes (or successes), and the fact that the video of your strike will be shown publicly in morning briefing, adds significant pressure to an already adrenaline-fuelled situation for some operators. Repeated high adrenaline spikes during the course of a shift, combined with pressure from continuous, intense external scrutiny, is one possible factor in the extreme fatigue some Reaper personnel experience. Grossman describes the 'parasympathetic backlash' that soldiers experience after the fight-or-flight response activates and spikes of adrenaline are released: 'The parasympathetic backlash occurs as soon as the danger and the excitement is over, and it takes the form of an incredibly powerful weariness and sleepiness on the part of the soldier'.[55] This qualitative research indicates a variation of response across Reaper personnel when it comes to both adrenaline response and parasympathetic backlash, which is – in turn – influenced by training, experience, psychological conditioning over time, and individual physiological and psychological traits. Consequently, the next question for future research asks: ***How can physiological and psychological states be developed to maximise human performance in remote operations?***

VISUAL INTIMACY AND ITS CONSEQUENCES

While the pilots or crews of other aircraft types like the Typhoon or Tornado will experience the same physiological responses to weapon use as Reaper crews, further related areas for future research are prompted in remotely piloted operations: the greater degree of image acuity and sustained visual intimacy; the potential for visual trauma; and the extent to which visual and mental proximity to targets influences the dynamic of killing. In addition, as well as describing the physical, extreme adrenal response to a weapon strike, Ross (see above) also introduced another important factor in individual and collective Reaper culture and identity – that of 'protector' or 'guardian'.[56] Self-identification with a protective role can be in either the immediate and specific sense of direct intervention as a self-defence action (i.e. defence of non-combatants or 'friendlies' on the ground), or in a more general sense of protecting societies in Syria/Iraq from the ideology and behaviour of ISIS and its fighters. The protective role has a strong ethical basis and is a powerful motivator for Reaper

personnel. It also opens up the possibility of either psychological harm or moral injury if individuals feel that they have failed to protect those that they feel responsible for.

A 2014 King's College London study of mental health in UK Armed Forces found 'no evidence of a tidal wave of deployment related mental health problems'.[57] There was no specific focus on Reaper operators in that study, which found:

> There is no evidence that the length of a single tour, or number of tours, has had an adverse effect on Service personnel's mental health, provided that Harmony Guidelines are followed. When the actual tour length exceeds the expected length, it has a substantial adverse impact on mental health and also alcohol misuse.[58]

Experiences of individuals with multiple, continuous Reaper operational tours may prompt new findings in a follow-up study. However, with PTSD rates for personnel deployed on the ground in Afghanistan between 2007-9 reported at 6.9%, anecdotal evidence from my Reaper research interviews do not suggest much variation from that level. This, in turn, does not – yet, anyway – diverge from levels of PTSD in civilian populations, with Norris and Slone, concluding: 'It is clear that only a fraction of people who are exposed to trauma develop the full syndrome of PTSD. Thus, despite the high prevalence of trauma exposure around the world, the lifetime prevalence of PTSD is no more than 7%'.[59]

On the Reaper Force, like any diverse population, a range of responses to traumatic incidents has emerged. At one end of the spectrum, a small number of cases of PTSD have been reported. Towards that end of the spectrum, Toby, a former sensor operator, presented himself at the mental health unit of a Ministry of Defence Hospital Unit (MDHU). He has a traumatic memory that affects him but 'I don't have enough ticks in the boxes for it to be full PTSD... I still have the odd dream where I wake up with the 'bang' of a particular explosion'.[60] Rory, another sensor operator, encapsulates the mixed feelings of many crew members, who live with extreme tiredness, regularly witness horrific events, and yet see these as a 'normal' part of life on the Reaper Force. He observes, of himself and others:

> If anybody on the Reaper fleet says it doesn't affect them, then they're lying. It does. It has to. But I really enjoy what I do and I don't think I would change anything about the last five years with the Reaper. Five years is more than enough in one go. I am well aware that I am probably six to twelve months overdue a rest – just physically and psychologically.[61]

Many others have echoed that sentiment: there are effects, but these are bearable for most of the people, most of the time. However, over time the number of traumatic, or potentially traumatic, events accumulate: sights that cannot be unseen, incidents that

stick in the mind. To add to the complexity of individual experiences on the Reaper Force, there are a small number of those who are apparently unaffected, or just minimally affected, by their experiences. Ken is no longer flying the Reaper but the influence of his experience persists:

> If I ever watch a TV programme such as Traffic Cop with camera footage from a helicopter, I immediately feel my heart rate start to increase and my mind will start to plan how best to conduct a weapon engagement on whatever person or vehicle is being tracked. Having spent several years looking at the world from, quite literally, a different angle, that perspective is, evidently, ingrained within my psyche and without hesitation is a skill-set that I am subconsciously eager to continue to employ. In all honesty I perversely miss the satisfaction and thrill of thinking on my feet, then planning and conducting a successful engagement; I'm content to say I actually enjoyed it.[62]

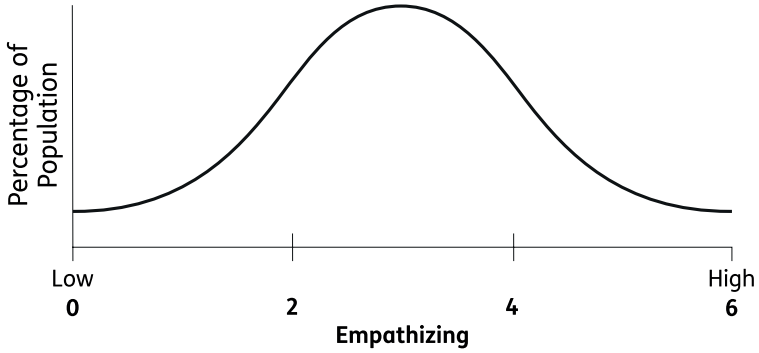
In a separate interview, Ken's wife reinforced what he had said: that he seemed relatively unaffected, given his experiences, and that he had enjoyed his time on 39 Squadron. Only a very small number of former Reaper personnel were as adamant as this about their enjoyment levels and the lack of impact upon them.

One of the difficulties, then, in making sense of individual reactions across the Reaper squadrons is that there is no common pattern of behaviour or response. It would appear that those with a fast jet background – who had been trained to use, or actually used, weapons – were generally well equipped to cope with the reality of killing and viewing traumatic incidents. They will have had the advantage of a lengthy fast jet training over several years where, from the outset, they would know that shooting and killing would be part of their future. Inculcation into Harrier or Tornado culture and operations would include that life and death dimension, which would not be found in the same way on maritime patrol, transport, or most helicopter fleets (except Apache). However, and contradicting that generalisation, others have come from non-kinetic backgrounds – and without the years of psychological conditioning that comes with it – and excelled on the Reaper, both in technical proficiency and in psychological endurance. Trying to make sense of this inconsistency prompts another question for future research: ***To what extent can individuals be socialised and conditioned to conduct lethal operations or observe traumatic events from Reaper, and to what extent do inherent levels of empathy shape individual responses?*** From all of the interviews and collective engagement with Reaper personnel and spouses/partners, I would suggest that individuals' inherent capacity for empathy is part of the mental wellbeing equation.

EMPATHY AND LETHAL OPERATIONS: COSTS AND BENEFITS

The vast majority of people experience empathy: 'Affective or emotional empathy is when you feel along with the other person'.[63] McGregor summarises the work of Baron-

Cohen in both the Empathy Bell Curve (shown here), and his 6-point Empathy Spectrum (below):[64]



Empathy Spectrum:

Point 0	No empathy and hurting others means nothing to them
Point 1	Capable of hurting other people but feels some regret if they do so
Point 2	Has enough empathy to inhibit them from acts of physical aggression
Point 3	Compensates for lack of empathy by covering it up
Point 4	Low to average empathy
Point 5	Slightly higher than average empathy
Point 6	Very focused on the feelings of others. An almost unstoppable drive to empathize.[65]

As the Empathy Bell Curve and Empathy Spectrum suggest, there is typically a small number of people in a population who experience an overwhelming degree of empathy with others (Point 6 on the spectrum). Two interviewees shared how they had each, independently, reached a point where they could no longer kill a human target, even when that person was positively identified as an enemy fighter, a legal target, and the strike was correctly authorised. Jake described his thought process in choosing which of two people to strike, in a shot that his crew was legally authorised to take but which could not hit both targets with the same missile or bomb: 'What right do I have to decide which one of you is going to live for another sixty years, have children and grandchildren, and which one of you is going to have your life ended right now? Do I have the right to make that decision?'[66] His language and tone indicated a strong capacity for empathy – putting himself in their places – which influenced his thinking and actions.

Meanwhile, at Point 0 or 1 on the spectrum there are a small number who react the opposite way, with little or no empathy (or the capacity to somehow disengage it), and are able to kill with little or no personal approbation. Consider the self-description from a Special Forces soldier: 'In a fight, physical or verbal, it felt like I was detached. It was almost like I was watching myself in slow motion and thinking clearly about

what needed to be done and how I was going to do it. There was no fear, no emotional connection to what was happening'.[67] On two occasions, almost identical descriptions of being 'in the zone' before and during a Reaper weapon strike have been shared with me. In February 2018, one very experienced crew member[68] described being 'absolutely cold' and his heart-rate 'barely moving' when striking a human target (while also confirming that he complied with ROE). Was that Reaper crew member congenitally predisposed and lacking empathy, or conditioned over time and through experience? Or a combination of those factors?

The previous two examples appear to be rare, with the overwhelming majority having a capacity for empathy somewhere between the extremes that not only allowed them to conduct Reaper operations but helped them to do so. Empathy can play a number of roles in day-to-day squadron life and the conduct of operations. Empathy can be a powerful motivator, especially in a protective role, in providing personal and professional fulfilment on the Reaper Force. It can also lead to powerful self-questioning if that protective instinct is violated. For Jamie, a mission intelligence coordinator, protecting allies on the ground in Afghanistan was a strong motivator, rooted in his own prior experience out on the ground. His first weapon event was against a Taliban vehicle that was transporting explosives, but resulted in several civilian deaths, which he observed in detail.[69] His thoughts at the time capture both his desire to make a positive difference through his work, and the immediate impact upon him when his aims and expectations were violated: 'How did I find myself in this situation? I joined the Reaper Force to make a positive difference after the shit I experienced on the ground in Afghanistan. How did my first weapon event turn into a nightmare, an awful nightmare?'[70] As well as watching the initial impact, Jamie and the crew also continued observing the area for hours afterwards and watched the bodies being removed from the destroyed vehicle.

More research will be needed to more fully understand the extent and role of empathy in enabling or limiting individual ability to conduct lethal, remote air operations. Lawrence *et al* set out to measure empathy, with some success. However, they caution that 'it is important to tease out the different kinds of emotional reactivity and distinguish between empathic and other types of emotional responses'.[71] Separately, Head explores the costs of empathy in the international political arena with the aim of demonstrating 'how it is frequently costly for those who make the ethical-political choice to engage in empathy in situations of conflict and political violence'.[72] This cost will vary according to the degree of empathy of the individual concerned and, potentially, the degree to which an incident also reflects or violates personal ethics. Every situation has the potential for great complexity. For example, a Reaper pilot might have a high capacity for empathy and be strongly affected by witnessing a public beheading that (s)he was unable to disrupt. As well as the potential for visually-mediated mental trauma [note: trauma is not assured], core ethical principles may be violated, thereby inducing a dissonant state. It is such a violation

of personal ethics or core beliefs that prompt the final consideration in this paper: the possibility of moral injury among Reaper personnel.

MORAL INJURY

The term 'moral injury' (Nash *et al*'s definition having been set out earlier in the paper) has gained significant public and academic profile in the twenty-first century. Edgar Jones points out that 'there is no agreed definition of moral injury', which makes the subject difficult to explain and explore from the outset.[73] In an extensive and growing literature, Drescher *et al* suggest: 'The term that has been used to describe the impact of various acts of omission or commission in war that produces inner conflict is *moral injury*'.[74] Meanwhile, Frankfurt *et al* refer to it as 'a transdiagnostic syndrome that describes the uniquely deleterious impact of committing or failing to prevent acts during warfare that involve violations, transgressions, or betrayals, of commonly accepted boundaries of behavior'.[75] All of these definitions presuppose a moral dimension to war, usually with each side claiming moral superiority over the other,[76] and each morality offering the possibility of violation.

The moral context for RAF Reaper operations is bounded by *jus in bello* in the operational domain and by the UK government's *jus ad bellum* justification for deploying air power against anti-government forces such as the Taliban in Afghanistan, ISIS in Iraq and Syria, and against the Syrian government in response to the use of chemical weapons.[77] While air strikes have had some public support, it has not been overwhelming. For example, in December 2015 Prime Minister David Cameron proposed extending attacks against IS from Iraq to Syria.[78] While 48% of respondents in one poll supported the action, with 30% opposed, there was not a clear majority in favour.[79] Moral injury becomes possible, according to Drescher, Frankfurt and others if social norms and the moral framework of a combatant is violated, either by an action, or lack of action, on their part. It also becomes possible if they witness acts that breach personal morality, such as the witnessing of atrocities like executions, rape or murder that the combatant cannot prevent.

Numerous variables are associated with moral injury: PTSD symptoms, self-injury, demoralization and self-handicapping.[80] Further, and more obviously linked to the term 'moral injury', Maguen and Litz suggest 'an act of serious transgression that leads to serious inner conflict because the experience is at odds with core ethical and moral beliefs'.[81] Other factors that are linked to moral injury include: shame, guilt, transgression of spiritual or religious beliefs, self-condemnation, social problems, trust issues, spiritual/ existential issues.[82] This very brief summary highlights the possibility that the concept of moral injury is in danger of being extended so far as to be too vague to be of practical or explanatory use. However, for the purpose of meaningful application to members of the Reaper Force I suggest that 'moral injury' is most likely to be applicable in the following situations: powerless witnessing (unable to intervene

to stop a heinous act); observations that grievously violate the watcher's social norms and core beliefs (for example, beheadings); and unintended ethical transgression (such as unintentional harming of a non-combatant). Consider three examples that could *potentially* contribute to moral injury, so defined.[83]

First, where individuals have witnessed in close detail the deaths of, or physical harm to, allied combatants or non-combatants for whom they feel a protective responsibility, but were powerless to intervene because of legal constraints (ROE), potential secondary threats to yet other allies or non-combatants, or because they could not see or anticipate the threat to life.

> That flash on the screen [as their vehicle exploded], and the feeling of impotence, just stayed with us. Our job was to provide overwatch on these guys, to protect them. We had been staring, looking for anything that might be a threat. But there was a big puddle over the junction, and the soldiers with their hand-held detectors couldn't see [the IED] underneath. That whole incident has stuck with me. I'm not saying I have PTSD, but I'm saying that I get how some people are affected that way.[84] (Johnny, Pilot)

Second, the violation of social norms. Sensor operator Jake struggled with the idea of taking life, but also struggles with the fact that he eventually adapted to it. Despite being able to make the logical, intellectual calculation of the relative moral benefit in killing jihadists who would otherwise inflict harm on others, the taking of life left a deep impression on him: 'I hate the fact that I've killed people. I hate the fact that I've taken life in a very calculating manner. But I also hate the fact that I seem to be able to live with it now'.[85]

Then, third, there is unintended ethical transgression – even where all of the legal and operational checks and approvals have been correctly observed. Jamie, mentioned above, and his crew had acted on the best available intelligence when they destroyed the Taliban vehicle full of explosives, yet still had to live with the unintended civilian deaths:

> I wanted to continue because for me it was always for some greater good. And degrading the enemy's capability was the primary role. Certainly not to injure or kill anybody that wasn't the enemy, and certainly not women and children, that's for sure. I never knew how I'd feel if that would happen, and again it's difficult to explain. You never forget. You never want to forget.[86]

Much work continues to be done on 'moral injury', and it is offered here as a potential explanation of some responses by Reaper personnel to experiences while conducting remote air operations. This paper argues that the immersive visual, emotional and

psychological aspects of Reaper operations plays a part in individualised responses to surveillance activities and weapon events in recent counter-insurgency actions. In relation to the foregoing sections and arguments, two factors relating to moral injury are suggested here for further future study. They emerged during data gathering by the author with several members of the Reaper Force, and assume that individualised capacity for empathy is an important consideration. First, that moral injury may be caused to more empathetic members of the Force by the way that less empathetic individuals speak about the enemy and killing. And second, for highly empathetic individuals (see empathy bell curve), ethics education is important in order for them to make sense of their actions in an operational-ethical context. For less- or non-empathetic individuals, ethics education may be even more essential, so that they can appreciate – intellectually if not emotionally – how they can negatively impact upon their colleagues. Such research may well provide insights and understanding that translates to other situations where visually traumatic events are encountered, from military imagery analysis to civilian website content moderators.

CONCLUSION

There have been enormous technological advances in the delivery of air power since the First World War days of the Royal Flying Corps, the Royal Naval Air Service and the advent of the RAF. Despite the technical developments that enable the Reaper to be operated across continents, war and air operations remain essentially human activities. This paper has focused on that human dimension, identifying emotional, psychological and moral complexities that emerge from the distance-intimacy paradox of remote air warfare. Yet even though much has changed, much remains the same. In March 1917, James McCudden reflected, in a language and tone that is now often parodied: 'sometimes one sits and thinks, "Oh, this damned war and its cursed tragedies."'[87] Yet a year later and not long before his own death he shot down an enemy German aircraft and recorded: 'As I looked at the machine I saw the enemy gunner fall away from the Hannover fuselage. I had no feeling for him for I knew he was dead'.[88] Even in the culturally coded language of the early twentieth century, the change in character and mental condition over time can be detected.

The close-up views afforded to Reaper personnel as they conduct ISR and strike operations makes the act of taking human life more visually intimate and therefore more psychologically and emotionally involving than it has ever been before for aircrew in the history of the RAF. It is important not to assume that psychological harms are either inevitable or long-lasting for everyone involved: they are not. However, it is equally important to recognise that a new dynamic has been introduced to the delivery of air power that can negatively impact on remote operators – on some more than others, and for reasons we do not yet fully understand. As the RAF enters its second century, the distance paradox brought about by the advent of the Reaper should not be underestimated, especially if remotely piloted aircraft are set to outnumber manned

counterparts in the coming years. The potential jeopardy of manned air operations is replaced by increased psychological and emotional jeopardy in remotely piloted air operations. This could be dangerous in an organisation that has, throughout its history, deliberately downplayed emotional and psychological risks and reactions almost to the point of parody. *Per ardua ad astra*, states the motto of the RAF: 'through adversity to the stars'. For RAF remote aircrew in the next hundred years, adversity – and achievement – will take place on the ground. Supporting and developing those remote operators is the next great challenge.

NOTES

[1] I would like to thank Alfie Macadam for his assistance in literature searching during his research placement week with me in June 2018.
[2] House of Commons Defence Committee, 'Remote Control: Remotely Piloted Air Systems – current and future UK use: Government Response to the Committee's Tenth Report of Session 2013–14', 20 July 2014, p. 14, **https://publications.parliament.uk/pa/cm201415/cmselect/cmdfence/611/611.pdf**, accessed 28 May 2018.
[3] Ben Farmer, 'RAF Reaper drone interrupts Islamic State public execution', *The Telegraph*, 16 May 2017, **https://www.telegraph.co.uk/news/2017/05/16/raf-reaper-drone-interrupts-islamic-state-public-execution/**, accessed 12 May 2018; BBC, 'Syria war: MOD admits civilian died in RAF strike on Islamic State', **https://www.bbc.co.uk/news/uk-43977394**, accessed 3 May 2018.
[4] HC 772 Defence Committee, 'Written evidence from the Royal Aeronautical Society', 15 September 2013, para. 24, **https://publications.parliament.uk/pa/cm201314/cmselect/cmdfence/772/772vw13.htm**, accessed 20 May 2018.
[5] House of Commons Defence Committee, 'Remote Control' p. 15.
[6] Ministry of Defence, 'New investment in counter terrorism for UK Armed Forces', 4 October 2015, **https://www.gov.uk/government/news/new-investment-in-counter-terrorism-for-uk-armed-forces**, accessed 8 May 2018.
[7] 'Royal Air Force Reaper: 21st Century Air Warfare from the Operators' Perspective', University of Portsmouth Research Ethics Committee Protocol E365, approved 21 October 2015, Ministry of Defence Research Ethics Committee Protocol 707/MODREC/15, approved 1 July 2016.
[8] Peter Lee, *Reaper Force: Inside Britain's Drone Wars* (London: John Blake Publishing, 2018).
[9] 90 interviews were conducted as follows: 45 current crew members (at the time of interview); 21 former crew members from both squadrons; 24 spouses and partners. The military participants included both women and men and ranged in non-commissioned officer rank from Corporal to Warrant Officer, and in officer rank from Flight Lieutenant to Wing Commander.
[10] A good starting point for further study is Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society*, revised edition, (New York: Bay Back Books, 2009).

[11] Damian Killeen and David Jordan, 'RPAS: Future Force or Force Multiplier? An Analysis of Manned/Unmanned Platforms and Force Balancing', *Air Power Review*, Vol. 16, No. 3 (2013) pp. 22-23.
[12] Albert Bandura, 'Disengaging morality from robotic war', *The Psychologist*, Vol. 30 (February 2017) p. 39.
[13] Ibid., p. 41.
[14] Grossman, *On Killing*.
[15] Ibid., p. 4.
[16] Ibid., p. 91.
[17] James B. McCudden, *Flying Fury* (Poland: Amazon Fulfilment, 2009) p. 219.
[18] Ibid.
[19] Ibid., p. 224.
[20] Leonard Cheshire, *Bomber Pilot* (London: HarperCollins, 1975) p. 135.
[21] Charles Webster and Noble Frankland, T*he Strategic Air Offensive Against Germany 1939-1945 Vol. IV* (London: Her Majesty's Stationery Office, 1961), Directive on 14 February 1942, p. 144.
[22] Stephen A. Garrett, *Ethics and Airpower in World War II: The British Bombing of German Cities* (New York: St. Martin's Press, 1993) p. 32.
[23] Ibid., 1993, p. 32-3.
[24] W. Hays Parks, "Precision' and 'area' bombing: Who did which, and when?' *Journal of Strategic Studies*, Vol. 18, No. 1 (1995) p. 146-7.
[25] Ibid., p. 148.
[26] I have written elsewhere about the ethics of the German city bombings and explored the nuances of 'intention', unintended consequences, and so on. There is not the scope here to reprise those arguments. See Peter Lee, 'Return from the Wilderness: An Assessment of Arthur Harris's Moral Responsibility for the German City Bombings', *Air Power Review*, Vol. 16, No. 1 (Spring 2013) pp. 70-90; Peter Lee and Colin McHattie, 'Churchill and the bombing of German cities 1940 - 1945', *Global War Studies* Vol. 13, No. 1 (2016) pp. 47-69.
[27] Gerald Wright, 'The Storm Shadow Cruise Missile', *UK Defence Journal*, 20 October 2015, **https://ukdefencejournal.org.uk/the-storm-shadow-cruise-missile/**, accessed 8 June 2018.
[28] MQ-9A Reaper, *Royal Air Force*, **https://www.raf.mod.uk/aircraft/mq-9a-reaper/**, accessed 15 June 2018.
[29] Chris Cole, Mary Dobbing and Amy Hailwood, *Convenient Killing: Armed Drones and the 'Playstation' Mentality* (Fellowship of Reconciliation: Oxford, 2010) p. 4.
[30] Peter W. Singer, *Wired for War* (New York: Penguin, 2009) p. 332.
[31] Peter Olsthoorn, *Military Ethics and Virtues: An interdisciplinary approach for the 21st century* (New York: Routledge, 2011) p. 126.
[32] Medea Benjamin, *Drone Warfare: Killing by Remote Control* (New York and London: OR Books, 2012).
[33] House of Commons Defence Committee, 'Remote Control: Remotely Piloted Air

Systems – current and future UK use', Vol. 1, 25 March, (London: The Stationery Office Limited, 2014) p. 42 (*italics added for emphasis*).
[34] International Human Rights and Conflict Resolution Clinic (Stanford Law School) and the Global Justice Clinic (NYU School of Law), *Living Under Drones: Death, Injury and Trauma to Civilians from US Drone Practices in Pakistan* (September 2012) **https://chrgj.org/wp-content/uploads/2016/09/Living-Under-Drones.pdf**, accessed 5 June 2018.
[35] Matthew Power, 'Confessions of a Drone Warrior', *GQ*, **https://www.gq.com/story/drone-uav-pilot-assassination?currentPage=4**, accessed 1 June 2018.
[36] Sarah McCammon, 'The Warfare May Be Remote But The Trauma Is Real', *NPR*, 24 April 2017, **https://www.npr.org/2017/04/24/525413427/for-drone-pilots-warfare-may-be-remote-but-the-trauma-is-real**, accessed 7 June 2018.
[37] Eyal Press, 'The Wounds of the Drone Warrior', *New York Times*, 13 June 2018, **https://www.nytimes.com/2018/06/13/magazine/veterans-ptsd-drone-warrior-wounds.html**, accessed 14 June 2018.
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[39] Lee, *Reaper Force*, p. 266-7. Pseudonyms are used throughout in accordance with my Research Ethics protocol. Ranks are omitted unless relevant to the point being made, and no participants asked for their gender to be obscured or anonymized.
[40] Dave Blair and Karen House, 'Avengers in Wrath: Moral Agency and Trauma Prevention for Remote Warriors', 12 November 2017, *Lawfare*, **https://www.lawfareblog.com/avengers-wrath-moral-agency-and-trauma-prevention-remote-warriors**, accessed 20 June 2018. This paper is highly recommended reading for the detail of its psychological insights which are not addressed here.
[41] Grossman, *On Killing*, p. 78.
[42] Chaiara Volpato and Alberta Contarello, 'Towards a social psychology of extreme situations: Primo Levi's If This is a Man and social identity theory', *European Journal of Social Psychology*, Vol. 29 (1999) p. 252.
[43] Herbert G. Kelman, 'Violence without moral restraint: Reflections on the dehumanization of victims and victimizers', *Journal of Social Issues*, Vol. 29, No. 4 (Fall 1973) pp. 25-61.
[44] Albert Bandura, 'Moral Disengagement in the Perpetration of Inhumanities', *Personality and Social Psychology Review*, Vol. 3, No. 3 (1999) p. 195.
[45] Ibid., p. 200.
[46] Lee, *Reaper Force*, p. 170.
[47] Ibid.
[48] Methodology note: these were consistent but *qualitative* observations made in interviews with 24 spouses and partners, and not rigorous, quantitative measures.
[49] About 5 years in total.
[50] Lee, *Reaper Force*, p. 59.

[51] RPAS(P) – an individual who was recruited to the Reaper Force and trained specifically as a Reaper pilot, as opposed to a pilot of another aircraft type who transferred across.
[52] Lee, *Reaper Force*, p. 111.
[53] Interviewee Vet 15 is a veteran of the Reaper Force.
[54] Sian L. Beilock and Thomas H. Carr, 'On the Fragility of Skilled Performance: What Governs Choking Under Pressure', *Journal of Experimental Psychology*, Vol. 130, No. 4 (2001) p. 714.
[55] Grossman, *On Killing*, p. 69. There is not the scope in this paper for a full study of this phenomenon.
[56] At a research feedback session with 13 Squadron on 14 November 2017, in response to my observation of the importance of the 'protector' role for Reaper and its personnel, a Royal Marine attached to the Squadron suggested 'Guardian' as his alternative, preferred way of conceptualising the Reaper role.
[57] King's Centre for Military Health Research and Academic Department for Military Mental Health, 'The Mental Health of the UK Armed Forces', October 2014, p. 2, **https://www.kcl.ac.uk/kcmhr/publications/Reports/Files/mentalhealthsummary.pdf**, accessed 25 June 2018.
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[59] Fran H. Norris and Laurie B. Slone, 'Understanding Research on the Epidemiology of Trauma and PTSD', *PTSD Research Quarterly*, Vol. 24, No. 2-3 (2013) p. 4.
[60] Lee, *Reaper Force*, p. 296-7.
[61] Ibid., p. 299.
[62] Ibid., p. 294.
[63] Simon Baron-Cohen, *The Science of Evil: On Empathy and the Origins of Cruelty* (Philadelphia: Basic Books, 2012) cited in Jane McGregor, 'The Highly Empathetic', T*he Society for Research into Empathy, Cruelty & Sociopathy*, May 2018, **http://www.sorecs.org/blog/**, accessed 20 June 2018.
[64] Ibid.
[65] Ibid.
[66] Lee, *Reaper Force*, p. 165-6.
[67] Kevin Dutton and Andy McNab, *The Good Psychopath's Guide to Success* (London: Bantam Press, 2014) p. 18.
[68] Research visit to squadron. For anonymity I will not even give his crew position.
[69] The 2011 CIVCAS incident was acknowledged by the RAF and MOD. It is described in full from Jamie's perspective in the chapter, 'CIVCAS', Lee, *Reaper Force*.
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[71] E. J. Lawrence, P. Shaw, D. Baker, S. Baron-Cohen and A. S. David, 'Measuring empathy: reliability and validity of the Empathy Quotient', *Psychological Medicine*, No. 34 (2004) p. 919.
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[73] Edgar Jones, 'Moral injury in time of war', *The Lancet*, Vol. 391, 5 May 2018, p. 1767, **www.thelancet.com**.
[74] Kent D. Drescher, David W. Foy, Caroline Kelly, Anna Leshner, Kerrie Schutz, and Brett Litz, 'An Exploration of the Viability and Usefulness of the Construct of Moral Injury in War Veterans', *Traumatology*, Vol. 17, No. 1 (2011) p. 8.
[75] Sheila B. Frankfurt, Patricia Frazier, and Brian Engdahl, 'Indirect Relations Between Transgressive Acts and General Combat Exposure and Moral Injury', *Military Medicine*, Vol. 182 (Nov/ Dec 2017) e. 1950.
[76] An example of contested moral superiority can be found in Tom Smith, Peter Lee, Sameera Khalfey, and Vladimir Rauta, 'Understanding the Syria Babel: Moral Perspectives on the Syrian Conflict from Just War to Jihad', Studies in Conflict and Terrorism, forthcoming 2018. Cited by permission of author.
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[78] IS [Islamic State] previously called ISIS – Islamic State in Iraq and Syria.
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[81] Shira Maguen and Brett Litz, 'Moral Injury in Veterans of War', *PTSD Research Quarterly*, Vol. 23, No. 1 (2012) p. 1.
[82] Ibid., p. 1-2.
[83] To reiterate, these examples are illustrative and not definitive. There are too many complicating factors that would have to be excluded for moral injury to be confirmed.
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[85] Ibid., p. 172.
[86] Ibid., p. 111-12.
[87] James B. McCudden, *Flying Fury* (Poland: Amazon Fulfilment, 2009) p. 130.
[88] Ibid., p. 239.