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DRONES IN MILITARY WARFARE: THE MORAL AND EMOTIONAL IMPLICATIONS OF AN EMERGING TECHNOLOGY

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Abstract

While there has been increasing interest in the organizational and technological issues related to emerging technologies, the moral challenges triggered by their use has received relatively little attention. In this paper, we study how emerging technologies raise moral challenges for people interacting with them by disrupting the meaning of their work. Specifically, we examine how drones ? an emerging technology in warfare used to remotely attack targets from offsite command centers ? disrupted the nature of work of military personnel and created moral issues. To address the challenges of working with drones and coping with these tensions, we examine 43 personal diaries from current and former military personnel working for the U.S. Air Force's ?drone program.? Drawing on observations, interviews, private diaries and internal documents, we explain how individuals struggle with emotional ambivalence ? the simultaneous pull of oppositional positive and negative emotions ? in interacting with drones and suffer moral injury but suppress displaying their emotions in a highly regimented military setting. We develop a model that describes the triggers and conditions under which actors experience emotional ambivalence and moral tensions from interacting with a technology that disrupts the meaning of their work, and the strategies they deploy to reconstruct their work as meaningful. We advance theory on the ?humane' aspect of emergent technologies by illuminating the moral and emotional implications for people interacting with these technologies.

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INTRODUCTION

"It is forbidden to kill; therefore all murderers are punished unless they kill in large numbers and to the sound of trumpets." (Voltaire)

Emerging technologies can lead to morally contentious outcomes by reshaping human interactions. One example is the increasing use of "Unmanned Aerial Vehicles" (drones) in modern warfare (Martin and Sasser 2010; Mulrine 2008), which has transformed conventional warfare requiring troop movements and extensive preparations to launch an attack. Drone operators, described as "cubicle warriors" (Gregory 2011, p. 192), sit in safe climatized offsite command center rooms, such as in the outskirts of Las Vegas, Nevada, and execute high precision strikes on remote targets with the click of a button (Gregory 2011). While the technology is praised for its surgical precision and regarded as the "cleanest weapon of warfare" in a virtuous war (Boyle 2015) and can deal with asymmetric warfare and reduce collateral damage vis-a-vis conventional warfare, it is also contentious. Drones have been criticized for detaching operators from warzones and dehumanizing brutal warfare by making it look like a "PlayStation" videogame that lowers the threshold of using violence (Gregory 2011; Paust 2009). Not surprisingly, drones have attracted widespread criticism, especially for "signature strikes" conducted against Iran's military leader Soleimani in 2020, ISIS leader al-Baghdadi in 2019, and a 16-year-old U.S. boy at dinner in Yemen in 2011.

Research on human interactions with emerging technologies has addressed a variety of issues, such as how virtual work distances workers from the physical referents of their models and changes the organization of work (Bailey, Leonardi and Barley 2012), how online communities are generative to knowledge collaboration (Faraj et al. 2011), and how opaque algorithms reshape occupational boundaries through novel forms of coordination and control (Faraj, Pachidi and Sayegh 2018; Kellogg, Valentine and Christin 2019). Interactions with emerging technologies, and particularly contentious ones, prompt significant shifts in how "people experience work in their daily lives" (Barley, Bechky and Milliken 2017; Barley and Kunda 2001, p. 77), such as by their behaviors being rendered hypervisible (Leonardi and Treem 2020).

While such changes to the nature of work-induced by new technologies can augment work, they can also create emotional and moral challenges for people interacting with them. However, few studies have focused on these challenges. As new technologies often enter realms without adequate guidelines on their governance, they can be morally contentious and emotionally demanding. Consider Uber, whose labor model's claims of freedom, flexibility, and entrepreneurship for its drivers are contradicted by drivers' experiences of anxiety and powerlessness (Möhlmann et al. 2020; Rosenblat 2018). A human "boss" is replaced by control through constant electronic surveillance and algorithms that favor the corporation over drivers by creating information and power asymmetries (Faraj et al. 2018; Pachidi et al. 2020). Artificial intelligence (AI) augments work but also compromises privacy (Munoko, Brown-Liburd and Vasarhelyi 2020), exacerbates bias, and generates feelings of learned helplessness (Lindebaum, Vesa and den Hond 2020).

To sum, emerging technologies can strip work of its core essence and raise questions about its moral legitimacy—being seen as desirable, proper, or appropriate (Rosso, Dekas, and Wrzesniewski 2010; Suchman 1995)—which evokes strong emotions. Despite a growing interest in emotionality in management studies (e.g., Huy et al. 2014; Voronov and Weber 2016; Zietsma et al. 2018), we still need to learn more about the emotional and moral side of human interaction with emerging technologies. How do people cope with the emotional and moral challenges of an emerging technology that changes the nature of their work?

The contentious use of drones in modern warfare is a fertile setting to examine this question. To this end, we conducted an inductive, qualitative study of military professionals working for the U.S. Air Force in drone (UAV) operations. We draw on unsolicited personal diaries, interviews, field observations, and archival data on the drone program. Members of the Air Force share a strong sense of duty to serve their country under a sacralized military doctrine. The drone program has revolutionized warfare by moving away from the costly invasions of foreign territories to remotely conduct surgical attacks on selected targets (Gregory 2018; Schwarz 2018). Since 9/11, the drone program has been pivotal to the Air Force, and military drones have been described as the "weapon of choice" by U.S. presidents and "the most important weapon development since the atomic bomb" (Singer 2010). From 2008 onwards, more UAV (drone) pilots have been trained than

jet fighter pilots. Violence in classical war with "skin in the game" is deemed acceptable, and even heroic, as opposing parties share a degree of risk. In contrast, drones have been described as a "weapon of cowards," and drone warfare as the "Taylorism of war," which is morally unconscionable or even dishonorable (Gregory 2018).

Our findings reveal that military personnel feel a sense of discomfort about the use of the new technology that allows both *distance* (e.g., remotely attacking targets) and *proximity* (e.g., becoming close to targets by observing them over prolonged periods). However, they perceive the technology in different ways. Some people perceive it as part and parcel of their profession and higher-order purpose, such as protecting their country from danger. Others, despite being professionally trained to control their emotions in difficult situations (e.g., de Rond and Lok 2016; Kahn 2019), suffering emotional distress arising from executing surprise drone strikes on targets from offsite locations. Through extended surveillance conducted from their "safe" office in a high-security U.S military base, drone operators develop a level of intimacy with their remotely located targets. "You're further away physically but you see more" is a common narrative (Gregory 2011). Drone operators also witness brutal scenes, such as watching their targets and civilians die. As drone technology brings both advantages (e.g., being precise and safe for the "good guys") and infringes moral values (e.g., being unjust and cowardly), it triggers conflicting emotions, which we term "emotional ambivalence." This refers to the simultaneous experience of "mixed feelings," arising from being "torn between conflicting impulses" (Ashforth et al. 2014; Pratt 2000; Rothman et al. 2017). We find that emotional ambivalence is amplified in organizations with strong social controls and sacralized doctrines (e.g., the military), where a culture of silence prevents the display of emotions. Rather, many people cope by suppressing their feelings in public, and instead, expressing them through writing personal diaries that reveal their conflicting emotions and coping strategies to "get the job done."

Our findings allow us to make three contributions. First, we bring an emotional perspective (e.g., Voronov and Vince 2012) to the literature on emerging technologies. We seek a greater appreciation of the role of emotions in the literature on emerging technologies from which they are conspicuously absent.

Emotions supplement cognitions, materiality and power as a way through which people experience technologies as meaningful and morally legitimate.

Second, we provide a model of the triggers and consequences of emotional ambivalence following the introduction of an emerging technology that brings advantages but also disrupts the meaning and moral legitimacy of work. Building on Hirschman's (1970) framework of exit, voice, and loyalty, we explain how organizational actors use different strategies to cope with the emotional ambivalence they experience, and how they attempt to restore the meaning and legitimacy of their work. While "ambivalence is inherent in organizational life" (Rothman et al. 2017, p.34), our model shows how working with emerging technologies can generate emotional ambivalence and how actors cope with it.

Third, we show the value of a novel methodology—the analysis of unsolicited diaries—to shed light on the moral and emotional side of working with emerging technology. While writing personal diaries described as a "technology of the self" (Foucault 1982; McDonald 1996) is a time-honored and culturally sanctioned way of animating innermost feelings (Klein and Boals 2001), we show their value in capturing the conflicting emotions that people experience, but try to control (Ashkanasy et al. 2000), regulate (Huy and Zott 2018), or suppress (Jarvis et al. 2019) in their interactions with technology.

THEORETICAL MOTIVATIONS

Management scholars have long studied how technologies affect human interaction (Leonardi and Barley 2010; Orlikowski and Scott 2008; Perrow 1967) and the nature of work (Barley et al. 2017). Emerging technologies and their virtual lure (Bailey et al. 2012) are pervasive—from virtual assistants serving as front-desk employees (Gustavsson 2005), online communities sharing knowledge (Faraj et al. 2011; Faraj et al. 2016), and AI taking over many tasks of erstwhile human domains (von Krogh 2018). Technology has fundamentally altered our lives (Zammuto et al. 2007) from the way we work, communicate, and manufacture things to how we engage in financial transactions and fight wars, often sparking intense and polarized debates among policymakers, business leaders, and workers themselves regarding the technology's impact on human welfare.

While there has been longstanding interest in the organizational and technological issues related to emerging technologies, and mostly from a socio-cognitive perspective (Orlikowski and Gash 1994; Tripsas and Gavetti 2000), few studies have examined how emerging technologies raise emotional and moral challenges for people by disrupting established work practices. For instance, the use of AI in policing has led to the "datafication" of the field and a shift from reactive to proactive policing. On the one hand, the use of predictive analytics for surveillance may reduce bias, increase efficiency, and improve prediction accuracy (Kellogg et al. 2019). On the other hand, it may reify bias and deepen societal inequality, while also reducing police autonomy and impersonalizing the communal aspects of the job (Brayne 2017). This raises emotional and moral challenges for police interacting with AI and predictive analytics.

People often seek positive meaning in their work as being worthy, moral, and fulfilling (Blustein 2019; Rosso et al. 2010), especially when leaders advance ideologies of work as having deep moral value (Kunda 1992) and providing a sense of fulfillment (Kahn 2007; Michaelson et al. 2014). Emerging technologies may not only change the nature of work for employees but also disrupt its underlying meaning and moral legitimacy (Suchman 1995). While technologies have been argued to be "ethically neutral" (Kaplan 2004, p. 227), they embody interests and ideologies (Bailey and Barley 2020; Pinch and Bijker 1987) and impinge on the moral values of people interacting with them. Because "emotions are linked to personal and moral values," such impinging evokes strong emotions (Roeser 2018). To understand the role of emotions that arise from interacting with an emerging technology that disrupts the nature of work, it is important to consider the burgeoning work on emotions in organizational and management scholarship.

Emotions, Context, and Distressful Environments

The study of emotions has gained increasing attention among management scholars (Ashkanasy, Humphrey and Huy 2017; Fan and Zietsma 2017; Sanchez-Burks and Huy 2009; Voronov and Vince 2012) as "emotions accompany all social actions, providing both motivation and goals" (Jasper 1998, p. 397). Emotions are affective evaluations that function as the "glue binding people together and generating cognitive commitments" (Turner and Stets 2005, p. 1), influencing both individual and group interactions (Hochschild 1979; Zietsma et al. 2018). *Social emotions* refer to emotions such as belonging, trust, respect, liking, bonding

and their opposites (Fan and Zietsma 2017). *Moral emotions* pertain to what feels right and wrong, or good and bad (Fan and Zietsma 2017; Kroll and Egan 2004). They are "feelings of approval and disapproval based on moral intuitions and principles... the satisfactions we feel when we do and feel the right (or wrong) thing, such as compassion for the unfortunate or indignation over injustice" (Jasper 2011, p. 287). Moral emotions are intertwined with people's legitimacy judgments (the affective dimension) about what feels right or wrong (Huy, Corley and Kraatz 2014).

Individuals experience emotions, but from a sociological lens, the manner in which they experience or express them is conditioned by social norms, beliefs, and conventions (Fan and Zietsma 2017; Huy and Zott 2018; Voronov and Weber 2016). Socially shared norms shape which emotions are appropriate to express or not in a particular situation described as feeling rules (Hochschild 1979) or display rules (Ekman and Friesen 1975). In her study of flight attendants, Hochschild (1979) showed how actors regulate their emotional display to conform to organizational demands for specific emotive demeanors (an air hostess putting on a smile even when distressed). Normative expectations thus influence the emotions that people are "supposed" to feel and display in particular situations (Turner and Stets 2005).

Organizational contexts shape how people handle their emotions (e.g., Huy 2002; Kahn and Rouse 2020). In some contexts, people regulate their emotions, be it for their wellbeing or to achieve a specific goal such as mobilizing resources (Gross 2015; Huy and Zott 2018; Kahn 2019). In other contexts, they conceal their emotions (Zietsma et al. 2018) by engaging in emotional "self-censorship" (Edmondson 1999). Emotional displays differ from physiological experience (Jarvis 2017), and emotional self-censorship may be induced by rigid social controls in order to "protect" oneself (Kahn 2019). Such distressful organizational contexts such as the ethnographic observations by de Rond and Lok (2016), and Fraher et al. (2017) on medical and military personnel and the military operating in warzones, reports a "culture of silence," where participants suppress their emotions and do not share them even with colleagues, despite confronting brutal situations. These studies illustrate the need to exercise strong emotional control (Fraher et al. 2017; Kahn 2019) and focus on "getting the job done."

To sum, a contentious emerging technology that changes the nature of work or muddies its moral legitimacy, creates mixed emotions among people that interact with it. The manner in which people manage their emotions is shaped by the organizational context and the social rules in place. Such mixed emotions have been described as "emotional ambivalence," which refers to being torn between conflicting emotions (e.g., happiness and fear) occurring at the same time and being "pulled" in different directions (Andrade and Cohen 2007; Ashforth et al. 2014; Pratt 2000; Rothman et al. 2017). On the one hand, people may experience positive emotions and derive "emotional energy" (Collins 2004) from the way in which they perceive the new technology as enhancing or augmenting their work. On the other hand, they may experience negative emotions, or even "moral injury" (Frankfurt and Frazier 2016; Ramsawh et al. 2014) emanating from work tasks perceived to be traumatic (Kahn 2019), morally problematic, or even illegitimate (Jarvis et al. 2019). In organizations characterized by strong social controls and a cultish compliance with professional norms and doctrines, people are expected to control their emotions and not openly display or share them. How then do people cope with the emotional and moral challenges of an emerging technology that changes the nature of their work?

METHODOLOGY

To address this issue, we draw on an inductive theory-building approach to study individuals in an organizational setting in which a new emerging technology has revolutionized modern warfare. Our primary data source draws on 43 unsolicited personal diaries by military professionals working for the United States Air Force in the Unmanned Combat Aerial Vehicles (UCAV) program. Personal diaries are intimate journals on their lived experiences and personal reflections and opinions. We complemented these diaries with interviews, participant observations, and archival documents.

Case Selection and Research Site: United States Air Force – "Drone Program"

The United States Air Force is the "aerial and space warfare service branch" of the United States Armed Forces, which is organized within the Department of the Air Force and belongs to the Department of Defense (DoD). The Air Force is regarded as the most technologically advanced worldwide. Besides its air and space operations, it provides air support for land and naval forces and aid for recovery missions in

the field (Internal document 29). The intensification of usage of UAVs in the past decade has strong implications for the ways in which the American army and the DoD conduct modern warfare. President George Bush at the time presided over what we know as the modern drone war beginning in 2004. By the end of 2008, there had been 46 strikes directed at killing "high value targets" (Internal document 120), often classified as enemy bomb-makers, which served to support American ground troops. With a decline in public support for the war on terror due to the mounting death toll of soldiers, President Obama promised to bring US ground wars to an end.

By the end of Obama's eight-year tenure as president, 542 strikes were recorded, and some news outlets had named him the "President of Drones" (Rogers 2019). Under President Trump, drone strikes continued in the quest for "precision warfare" to win global wars with little risk to American lives. Under Trump's administration, the procedures changed; for example, by classifying regions such as Yemen and Somalia as "areas of active hostilities" and altering the chain of command. This allowed strikes to be launched without direct presidential involvement in the decision-making loop (Schwarz 2018). The killing of Iran's most senior general in a 2020 attack by a highly powerful and lethal "Reaper drone" was the first time the U.S. had used the technology to kill another country's senior military commander on foreign soil. Given the increased importance of the drone program for DoD and the U.S. military, the need for qualified personnel flying, operating, and maintaining UAVs has surged.

Data Sources

Our principal data set comprises the personal diaries of individuals working for the drone program in the Air Force. Personal diaries are useful for capturing the thought processes and emotions not articulated in social settings (Radcliffe 2017). We also conducted interviews with diarists to understand their experiences, asked follow-up questions based on what they had written in their diaries, and conducted participant observations in the field and a study of internal documents. We conducted an ethnographical observation through visits to a military base (center of the drone program) on the outskirts of Las Vegas, Nevada, to get a feel of the contextual situation in which these diaries were written (see Table 1). The military sector has a dislike for the word "drone" and instead uses "unmanned RPAs" (remotely piloted

aircraft). Here we use the popular term, drones. This study was approved by the internal ethical board.

Diaries: Diaries, a form of personal document (Taylor and Bogdan 1984), were the primary data collection mechanism. As Balogun et al. (2003) point out, the "main strength of diaries lies in their ability to collect large amounts of real-time information from a wide group of respondents through time— particularly when it is necessary to capture reflections and perceptions either frequently or after unpredictably occurring events" (p. 201). Personal diaries allow comparison with other data sources by providing "an intimate view of organizations, relationships, and events, from the perspective of one who has experienced them him—or herself" (Bogdan and Taylor 1975, p. 7). This approach allows probing into insiders' accounts of a situation (Burgess 1984) while also tracking what participants actually do in the absence of a researcher (Perlow 1999). This approach was valuable in light of our research question to understand emotions in a context with social controls. They range from five months to nine years. The diarists recorded in situ their experiences, feelings, and personal accounts, and included personal reflections on their work, events, and lives, among other things (see Radcliffe 2017). We obtained consensual and voluntary access to the diaries written by focal actors. The diaries were written voluntarily, and the organization did not encourage, promote, or have access to them. They were for private use, similar to the diaries written by Anne Frank. The motivations of diary writing were strictly personal, some describing it as a "fun activity that I liked as a teenager" to "a way to talk to at least somebody which I picked up during my military time," and "a self-improvement technique that I read about online."

We used a snowball sampling approach (Biernacki and Waldorf 1981), i.e., "a study sample through referrals made among people who share or know of others who possess some characteristics that are of research interest" (p. 141). We did not directly ask diarists to participate given the sensitive nature of the information, but we relied on the unsolicited referral of individuals encouraging other colleagues to participate by sharing their diaries. Our experience of doing research in extreme settings, gave us legitimacy in being able to relate and "speak the same language," including our independent role as researchers (we do not hold any institutional ties to the Air Force, nor are involved in any consulting, education, or any other Air Force activity). We took special care to uphold the trust placed in us, as these

diaries contained the actors' innermost thoughts and reflections. We anonymized the data to protect the diarists' identities and those of the people they talked about. Given the sensitive nature of some diaries' contents and data protection issues, we refrain from referring to specific missions, procedures, and individuals. All handwritten diaries (14) were transcribed professionally.

Interviews: After reading the diaries several times, we invited the diarists off-base for semi-formal and in-depth interviews to follow up on emerging issues. The interview guidelines were designed in light of our research interest in their work in extreme contexts, their motivation to join the Air Force and specifically the drone program, and their experiences. The interviews lasted between 45 and 120 minutes. We used a critical incident method, asking the diarists about their individual experiences and significant memorable events (Chell 2004). Overall, we conducted 43 interviews, which were recorded and professionally transcribed verbatim. Four diarists preferred not to be recorded. In these four cases, we took detailed notes on the contents of the interviews after they were finished.

Ethnographical observation: To understand the uniqueness of the context, i.e., warzones, one author obtained consensual access to visit a military base in the U.S. several times over the course of study. She attended several "preparatory" meetings and training sessions in order to be equipped for the visit and learn the typical language spoken in the field. She also received a security clearance to observe the "daily activities" at the military base. She traveled to the base seven times over a period of six months, spending three to five days in a row to observe daily life, including night shifts. During field visits, the first author conducted and recorded "casual conversations" with members other than diarists to obtain immediate reflections on their activities, and recorded them as field notes within 24 hours. She also took part in activities outside the military base, such as friendly gatherings (e.g., barbeques and a local baseball game), which were also recorded in the field notes within 24 hours.

Documents: We got access to internal documents that reflected different activities, training syllabuses, information pamphlets, and PowerPoint presentations. In total, we gained access to 2,937 documents, including annual reports, information for pre-deployment, mission briefings, reports on PTSD prevention, and redacted dissertations written by military personnel (e.g., on MQ-9 Reaper remotely piloted

aircraft). We also gained access to archival documents on the drone program covering strategic activities, legal and ethical aspects, mission preparation documents, and operational procedures.

Data Analysis

We followed a theoretically sensitized inductive approach (Glaser and Strauss 1967; Strauss and Corbin 1998). We iterated between data, emerging themes, and theories throughout our analysis (Locke 2001). We were intrigued by how an emerging technology altered traditional warfare. Our hunch pointed to changes in the nature of work and the mixed feelings these generated. We followed a five-step analysis process.

First, we familiarized ourselves with the specificities of working in extreme situations and the "drone war," delving into work addressing the military, recent missions, and political and societal debates on this topic. We consulted news articles and press releases from institutions associated with the drone war, including the focal organization, and other organizations operating in similar contexts, such as the UN and Human Rights Watch (e.g., Human Rights Watch 2008). We used NVivo to identify key themes and sub-themes.

Second, we elucidated the changes in the nature of work through the drone program. We created tables and timelines, stating background information, important key events, and mission experiences (Van de Ven and Poole 1990) for the different diarists. The development of chronologies revealed that individuals agonized over reconciling different feelings when reflecting on their work with drones. This early analysis also revealed a tension, that respondents described as a "paradox," to be on an Air Force base in the middle of Nevada, but also entrenched in missions such as in Afghanistan, Pakistan, and Yemen. Actors frequently pointed to "mixed feelings" ranging from pride, belonging, and liking, to hate, shame, and mistrust when describing their work. We began our analysis with open coding of the textual database, and engaged in a first round of *in vivo* coding by staying true to the terms and phrases used by our informants (Locke 2001). The frequent and explicit use of the terms "changes," "close by and far away," "technological," "social," "legal," and "right and wrong" facilitated the selection of passages in texts. We categorized the *in vivo* codes into a set of categories for subsequent comparative analysis (Locke 2001).

Third, we collapsed similar codes and created first-order categories, which enabled us to move from

provisional to advanced categories (Locke 2001). We noticed that actors frequently referred to "not sure if the drone program is a good or bad thing" and "doubtful that we make the world a safer place by using the 'the safest weapon of warfare.'" Actors agonized about being "pulled" and "torn" between a sense of pride and shame. Such statements about social and moral emotions led us to further probe the triggers of emotional ambivalence, as well as how actors experienced and responded to it. We identified and grouped different aspects of changes in the nature of work that triggered emotional ambivalence, i.e., (1) technological aspects, (2) rules of engagement and procedures, (3) social aspects, and (4) legal aspects. We identified how these four changes in the nature of work were disrupting its core meaning and moral legitimacy. Actors questioned: "Am I still a soldier considering the changes?" (Diary 20), and "What are the moral standards of my doing?" (Diary 29).

Fourth, we explored the actors' response strategies. Drawing on the diaries written in situ by focal actors provided us with a detailed elaboration into the world of individuals working in a setting characterized by the need to "remain silent" and exert "emotional control" at work. In this step, we also recognized differences in response strategies to emotional ambivalence. We identified two different response strategies. One group engaged in (1) adding and modifying meaning, and a second group engaged in (2) upholding the status quo. When further synthesizing our data, we noticed that the response strategies changed over time, and a third response strategy emerged, i.e., (3) leaving the Air Force as a "last resort." At this point, we identified a link between our findings and Hirschman's (1970) work on loyalty, exit, and voice. Adding and modifying meaning mainly pertains to loyalty but with traces of "voice" (as actors are wary of expressing emotions or airing grievances given the high social control), upholding the status quo to "loyalty," and leaving to "exit." We engaged in axial coding to identify relationships among different categories (Strauss and Corbin 1998). Going back and forth between data and theory, and following common practice (e.g., Corbin and Strauss 1990), we compared our respondents' reports, discerning differences across time and groups and generating theory-driven second-order categories.

Finally, we collated our derived categories into a theoretical model to understand how individuals manage emotional ambivalence arising from changes in the nature of their work. We initially developed

alternative theoretical models, which we 'tested' by returning to the empirical data and subsequently synthesizing those aspects that most closely matched our observations. We conducted member checks (Lincoln and Guba 1985) for our findings and model that we discussed with various diarists on several occasions during and after data collection.

-------Insert table 1 and 2 here-------

FINDINGS: THE EMOTIONAL SIDE OF AN EMERGING TECHNOLOGY

Introduction of an emerging technology

Amid geopolitical developments, such as the partial withdrawal of ground troops in Iraq and Afghanistan, demands on the drone program have escalated. In the Air Force, this led to an increase in training drone pilots, operators, and other personnel involved in drone operations to deploy precision strikes with the aim of "kill[ing] the bad guys" while purportedly saving the "good" (Rogers 2019, p. 3). The latest UN report (2020) refers to this progressive transformation as the "second drone age," with 102 countries active in the "drone war," stating drones are "[…] now more capable of targeted killings both near and far, drones are becoming stealthier, speedier, smaller, more lethal and operable by teams located thousands of kilometers away" (p. 5). This allows military drones to stay airborne for more than 20 hours, traveling distances of over 1,000 km at about 300 km per hour. Such drone systems with sophisticated hardware and software collect massive amounts of data (e.g., observational data on the movement of troops or insurgents), as well as private conversations conducted on mobile phones and computers.

A dominant theme to emerge from our data reflected growing ambivalence among actors with regard to the nature of work with new demands, procedures, and rules of engagement for the drone program. For example, respondents frequently shared how these changes affected them in profound ways:

> "[Our] work is all of a sudden so different through the usage of UAVs as we no longer travel to the war zone physically. We are not gone for weeks and months but have a kind of 9-5-job in the desert of Nevada. I am no longer a war hero but a desk junkie operating a drone a thousand miles away […] We are all moved from the 'Air Force' to 'Chair Force'. [I am] in need of a thick skin to press those buttons [to launch strikes]." (Interview 31)

Others state that "the drones have changed everything. They have changed the U.S. Air Force, for what it stands and what it is. We are no longer the Air Force but the Drone Force" (Interview 39); and

"Everything changed through UAVs, rules of engagement, tactics, techniques, procedures but also how I feel as a soldier. Less certain if the changes are for the better" (Interview 11).

Four types of changes in the 'nature' of work for drone program participants

From our data analysis, four specific themes emerged in relation to changes in the nature of work and the origins of emotional ambivalence among actors working in the drone program: (1) technological aspects, (2) rules of engagement and procedures, (3) social aspects, and (4) legal aspects.

Change in the nature of work 1: Technological aspects. Drones have significantly altered the way in which war is conducted, with the Air Force leading the way when it comes to technical sophistication. One respondent stated with a strong sense of pride in our first field trip to the base: "Welcome to the goddam best drone program in the world" (Field note 10), and a colleague noted: "If I give you the specs [specification] of what we are capable of doing, any insurgent around the globe is shitting in their pants. The latest reaper is a beauty, oh boy" (Field note 10). Many noted how drones allow tactical advantages, describing them as an "ideal tool" to "support the troops on the ground." At the same time, they also pointed out that their equipment and infrastructure might look less "Sci-Fi" than it is portrayed in popular media. "Our computers are clunky, many monitors, and let's say user experience and beautiful interface didn't cut the priority list" (Field note 10).

The drone program removed the need for the "direct involvement" of personnel, i.e., geographical proximity to an active war zone. The subsequent deployment of armed drones has made the "optical detachment" even more complete (Schwarz 2018). Most missions are controlled by a group of drone operators through a satellite link in ground control stations at an Air Force base, such as the one in the outskirts of Las Vegas, Nevada. Actors are assigned different groups and "target packages" (Internal document 29) with regard to the information content and purpose, ranging from solely observational goals to launching a potentially lethal strike. An informant reflected on the geographical proximity to the target.

> "We are in absolutely no danger here [in Nevada]. We walk into our compartments depending on your assignment, which is mostly assigned to Afghanistan or Pakistan. You step foot into your 'office of the day' for the next 10-12h before your hand over your work package to the next incoming crew. […] This one step brings you in an entirely different part of the world and a different

time zone. All of a sudden you are tracking the movements of a group in South Waziristan and you are asked to do a flyover or do a follow-up on a group of objects [suspects]" (Interview 29).

While our respondents described their workstations with changing assignments as less problematic, many shared the tensions and the realization of "what you are actually working on" when they left the base (Interview 20). They described their emotional turmoil when in mundane surroundings as "the true problem" (Interview 10), which was also described as the "PlayStation mentality" (Boyle 2015, p. 106). This refers to the moral distance between the operators and target areas. One drone pilot noted:

> "It is a surreal feeling the moment you step out of the control room, within minutes you are no longer in a combat zone but on your way back home to your family in peaceful America. Maybe doing a quick stop at Walmart to pick up some groceries for the BBQ planned or get a slushy. Minutes before you were gathering intel in Pakistan. This transition is the hardest part of the job because one has no such switch button in the head to change from being in Pakistan to your daughter's birthday party in a second later, or a fight with your wife because you forgot to take out the trash. We are expected to change from a war setting to happy family life in an instant." (Interview 09)

Actors described this fast-paced "context switching" as highly problematic, despite their praise for the technological advancements and their appreciation for spending more time closer to home and their families. At the same time, they expressed frustration at "not being able to support on the ground with physical presence when it is most needed, and you almost feel useless sitting in the U.S. and you wish to be in action with your boots on the ground" (Interview 21).

Another key technological issue was mistrust in the reliability of a potentially lethal technology. It was extremely risky to conduct drone missions in bad weather conditions, such as the risk of icing the wings, and bad weather (e.g., rain and thick clouds) resulting in "making the bird [drone] useless" (Interview 30). In informal conversations, actors often complained about how technological glitches, such as the frequent loss of satellite links, lags in information transmissions, and bad image quality, resulted in costly mistakes killing innocent people or not "being able to do shit [provide assistance to ground troops]" (Interview 10). Such glitches were reported in an official Air Force inquiry into a 2010 drone-related incident in which over 20 Afghani civilians were killed. An Air Force officer in the official hearing noted:

> "Not to trust birds [drones], and I say that honestly, sir, in our community we have been brought up to believe we can rely on the Preds [Predators], and ISR [Intelligent, Surveillance, Reconnaissance] for good intel [specification]." (USAF 2001: 001507)

Despite such misgivings, actors also noted being impressed by drones' technological capabilities. They experienced positive feelings such as pride in the technological sophistication of drones, and negative feelings of having "lost the skin in the game" with no time spent in conflict zones (Interview 15), extreme "context-switching" during a day, and frequent glitches.

Change in the nature of work 2: Rules of engagement and procedures. Another key change in the nature of work was change in the "rules of engagement," routines, and procedures associated with drone technology. Actors drew on different examples, such as changes in the "definition of targets" and "too much information," but also how their engagement was "super powerful in protecting our troops" and brilliant for "situational awareness" to "make sure our boys are coming back home safe" (Interview 10). Unlike conventional warfare in the Airforce, where people have little information about "what happens on the ground below," actors found it extremely challenging to closely monitor people that they knew were living their last moments and about to be killed (Diary 22). One diarist (pilot) reflected:

> "The biggest problem is […] we are required to watch humans dying. Making sure they are actually dead. When we send a missile down, we never really know if there are causalities and civilians involved. And seeing a little human being last seconds before it all ends [life], especially if it's a child is just cruel. […] And then we hover above to see if they are still moving, or running away, if we can PID [Positive identification, e.g., weapons] or we were just wrong again in sending down another hellfire missile" (Diary 33).

Actors could closely observe deadly accidents, describing them as "problematic," especially when involving young children, women, or the elderly were involved. At the same time, the death of young male children was considered "less problematic as they will be future insurgents and we can probably justify that are male in combat age whatever that exactly means" (Interview 07). Two sensor operators noted: "We have a way of making our statistics look pretty. It is all about how you define accidents" (Interview 25), and "Since Trump is in power, we don't report them altogether. They simply do not exist" (Interview 28).

Many described the lack of information in their "target packages" and scant follow-up information on previous drone missions to be "problematic" and creating mistrust. It was described as "unsatisfying" as "everything is only on a 'need to know-basis'" (Diary 41). This was especially the case for missions involving human casualties. One operator noted: "It is increasingly unsettling me not knowing if we got the

right target or not and nobody is providing us with follow-up information. They don't trust us?" (Diary 30). Our respondents reported the "need to know" basis of missions and feeling "disturbed when Trump went on national TV in a press conference, airing classified video footage from last strikes, and blabbering out classified intel on various sensitive missions" (Interview 41). Others noted that when it came to classified intelligence, "Fox [TV channel] seems to know more than me about my own job" (Diary 24).

This imbalance between "front-row seat to dying" and "no follow-up information" paired with "sketchy and blurring lines of the definition of targets" triggered feelings of disapproval, anger, and outrage. At the same time, they expressed satisfaction about having a big impact when supporting colleagues on the ground or "removing one more Tali [Taliban] from the world" (Fieldnote 36).

Change in the nature of work 3: Social aspects. A third change in the nature of work pertains to the social aspects of work vis-à-vis conventional warfare. Such social aspects were characterized by changes in social group cohesion, organizational culture, and the types of "relationships" with colleagues, as well as with those being surveilled and targeted at the same time. Actors described reduced interaction among different group members and lack of engagement at a personal level during lunch breaks or occasional cigarette breaks. People mostly "keep to themselves at work, come in, go to their container with their usual colleagues but other than this there is no interaction" (Interview 39). One respondent described it as "silent and no private connection or stuff happening outside" (Interview 18). We also observed such social alienation at work where different members sat separately during lunch breaks, even if they could join others, focusing on their plate and sitting alone for the remainder of the break. When we followed up on these observations, actors stated that what we saw "was absolutely normal." A drone operator pointed to this lack of collegial interaction as, "People stick to themselves, maybe going with one max two to eat but most people don't talk during breaks. Mostly one is in their own zone" (Interview 07). Those with previous experience "on the ground" appeared to be rueful. Many noted a lack of "typical brotherhood" formed on overseas missions from months of sharing bunk beds with little privacy and becoming "members for a lifetime" (Interview 20). Actors noted how bonds developed in the battlefield crossed over into their private lives through attending weddings, godfathering a colleague's child, or naming their own child after a fallen

friend, stating, "the least I could do" (Interview 12). In the drone program, there was no such camaraderie: "We are not team Spartans in here. For many, it seems to be just a job that helps to pay bills, but there is no pride to be part of the platoon […] or striving to be the best platoon" (Diary 16).

While there was little social cohesion *within* the drone team, drones allowed personnel to form new and different kinds of social relationships with people they were assigned to observe, surveil, and target. Actors described this as "taking part" in local social life through almost live footage. While this was described as advantageous for their work by creating "great situational awareness," it also allowed them a peek into the mundane life of locals appearing in the background on screens.

> "Can observe that school is starting again. The three boys from that house directly at the river, we always call them Huey, Dewey, and Louie [as in a popular cartoon show], they are always up to some youthful shenanigans. Last week on way to the morning prayer, they seemed to have flattened the tires of the neighbor's truck and watched from a safe distance how the old man cursed and blamed his sons. Looking forward to what they are up to this week. They remind me of my youth back at the farm in Idaho doing stuff with my brothers" (Fieldnote 23).

Others described similar experiences of "feeling part of their lives," noting, "I have been watching their family life for a substantial time. I attended the wedding of their second youngest son, the burial of their aunt, and several cousins after one of our strikes" (Diary 19). A sensor operator illustrated such social bonding. "Sometimes it goes even that far, when we are bored during nightshifts when not much is going on, we fly over Michigan [nickname given to a rural area in Afghanistan, characterized by lakes] and check up on Kim [Kardashian] and update on her recent boy drama" (Interview 23).

While prolonged observation brings actors "closer" to potential targets, they also noted downsides to this "continuous big brother watching" (Diary 29). For instance, they expressed their pent-up rage of having to witness how insurgents or terror groups moved into villages and used violence against people, "without being able to help or literally do anything" (Diary 29). A diarist described:

> "The moment I can see with my bird how that MF [profanity] comes, pulls her dress up, and puts his dick in her pressing her against the wall. I can see how she is fighting back; he gives her a knock with his rifle. Can see how she is screaming. Can hear it without actually hearing it. […] I know calling JSOC [Joint Special Operations Command] makes no sense. Best not even to state in the report afterwards as will be classified as weak. We are not going to launch a missile just to blow this fucker, but this is what I want to do." (Diary 34)

Such experiences were described as "particularly difficult in a setting where emotions are unwelcome" (Interview 10). From "not fighting side by side" and instead "sitting side by side in front of monitors" (Interview 12), actors reported feeling askance about their colleagues. One drone operator noted that the trust, respect, and liking within the group was "at an all-time low" (Field note 39). Many lamented a lack of belonging and not being bound by a "typical brotherhood as when you've been with the boys in Iraq. Here we are a bunch of strangers doing office work detached from actual war" (Diary 18). Some even questioned why colleagues joined the drone program. "One has to wonder why he decided to work here and not in the real war? Or was it a demotion because he screwed up somewhere else?" (Diary 15). However, they did not confront others about their motivations to join the program.

Change in the nature of work 4: Legal aspects. A fourth change in the nature of work pertains to its legal aspects. It led actors to question the purpose and legal foundations of war and their work, the definition of what is "morally good and bad," or "right and wrong," and the definition of target areas as reflected by statements like "We can strike everywhere it pleases us." As one actor put it bluntly: "Is that actually legal what we are doing here? Who gave us the power to play god in Afghanistan?" (Diary 10). In a diary entry, a pilot reflected on the legality of the assignment and the very personal role in that process.

> "Who are we to play God to decide with a joystick in a compound thousands of miles away to execute somebody without a fair trial or any interrogations whatsoever? It was different when I had skin in the game and was on the ground in Helmand [Afghanistan]. […] And after all, who gave me the right to do it? How do I really know that guy is an asshole?" (Diary 29).

Others cited the increasing media coverage on the drone program as an additional "headache" that caused anxiety. For example, a diarist reflected that a television documentary he watched in the early days of this tenure in the drone program made him reflect on the legality of war describing his trust in the organization, but at the same time, the surprise about the potential violation of international law.

> "I trust our bosses make sure that we [Air Force] do the right stuff and we have all the rights to do so. […] They [documentation] stated that we [Air Force] violate international law and sovereignty of different states by flying attacks in their countries. […] I was not aware of this at all. I thought we are the good guys and we have all the reason and backing to actually engage in fights in different countries" (Diary 23).

Actors had issues with the secrecy associated with people on their "target list" and not knowing "who and how (someone) ends up on my desk" (Diary 07). Most missions are "kill" missions without a chance for the targets to defend themselves or have recourse to law and courts.

> "They have no chance to present their case and defense. How do I know that this is actually an insurgent and the stuff in his truck under the sheet isn't stuff for the harvest in his backyard and not to blow someone up? Just cause [he] wears a greyish kameez shalwar [traditional male clothing in parts of Afghanistan and Pakistan] like everybody else?" (Diary 04).

Actors described the shift toward more lethal missions and the lack of due process as deeply disturbing. Diarists cited the development of the so-called "Drone War 2.0" and the lack of a legal framework as a cause for concern, particularly when considering other countries involved in drone technology While actors shared a sense of belonging in the Air Force and pride in the organization, including trust in the "rightness of missions," they also expressed misgivings after their own immersion in the drone program and exposure to external reports. Some went as far as to note, "Very ashamed we define any male above 12 as a combatant. This cannot be legal. If so, half of the US is a military aged male" (Diary 21).

Disruption in Meaning, Problematization of Moral Legitimacy, and Emotional Ambivalence

Actors struggled with how this emerging technology changed the nature of their work in terms of its technological aspects, rules of engagement and procedures, and social and legal aspects. They frequently asked, "Am I still a soldier?" and "Is my work legitimate?" These changes took out the core meaning of work and impugned its moral legitimacy, creating mixed feelings. We thus subsume the four changes under 1) change in core meaning, 2) problematization of moral legitimacy, and 3) emotional ambivalence.

Disruption in the core meaning of "being a soldier"

Participating in the drone program took the essence out of "being a soldier" and participants lacked "feeling like a war hero" (Interview 41). While some actors expressed positive feelings such as "We won't lose any friends anymore if we use RPAs (remotely piloted aircraft)," "no more funerals to go to," and "surveillance much better now," many lamented not seeing themselves as soldiers anymore and not being treated as respectfully as colleagues "who actually travel to the front line." A drone operator noted:

"After Iraq, I got a medal for my service, even a bonus. There was a whole welcome kerfuffle at the airbase; we got treated like stars, like celebrities. […] Never shook so many hands than there. The lady in the local hair shop gave me a free haircut. Now after working 12 months at Creech nobody could give a damn about my service…People seem to think just because I sit in front of a computer, I don't do anything dangerous. Ok maybe not physical but they don't know that I have killed more people here [in the U.S.] and seen and watched dying, than during my whole tour in Iraq" (Diary 13).

Those who had served in conventional warfare noted that being on a real battlefield was a source of pride and admiration, but once they joined the drone program, they had lost this respect. An operator noted, "There are days I am ashamed of what I do," and most even hid their involvement in the program.

Second, actors noted the perpetual dimension of "enduring war" and how "the globe became the battlefield" (Interview 09). The typical work schedule at Creech Base consisted of a minimum eight-hour shift for six days in a row, followed by three days off. We met one pilot after work for a coffee off base. "Our birds run 24/7, 365 days a year. Wasn't it supposed to be that a war has a mission or purpose?" (Field note 65). Our analysis suggests that actors felt deeply distressed about the disruption in their work, moving from short-term assignments overseas followed by long "decompression phases" to a "constant war at a relentless pace" (Diary 29). "War becomes my daily job. The concept of war has changed" (Diary 40). However, they appreciated having more time with family, even if it required jarring context switching.

Third, despite being part of the "new 21st century war," working in the drone program was considered a second-rate military career (Internal document 236). The lack of recognition of drone pilots was seen by many as a "career suicide," a "dead-end job," or a "de facto demotion." The first "generation" of pilots that were "asked" to join the drone program were "medically disqualified pilots" at the "bottom of the Air Force barrel." While being a fighter pilot was an esteemed professional identity, popularized in movies like *Top Gun*, "drone pilot" was an emasculated concept requiring no bravery or physical endurance. The Air Force had only recently established a career path for drone pilots (Internal document 560).

Fourth, participation in drone warfare received neither recognition nor accolades. Attempts to recognize and reward participants were quickly shot down. In 2013, the then Defense Secretary Leon Panetta announced a new medal, "The Distinguished Warfare Medal," for recognizing contributions that "directly impact on combat operations, but that do not involve acts of valor or physical risk that combat

entails" (Panetta, 2013). However, this medal—the first new one since World War II—received backlash from veterans group denigrating it as a "Nintendo medal," and it was quietly withdrawn by the new Defense Secretary. It was argued that no medal of merit should be ranked above that of valor and risk to life. The DoD recently announced that drone pilots were eligible for existing medals and certificates (e.g., Distinguished Flying Cross), but these needed to indicate merit in non-combat roles and cyber operations.

Problematization of the moral legitimacy of work

The legal muddiness of drone warfare impugned its moral legitimacy. Actors often referred to it as both legitimate and illegitimate. They reported a sense of pride and moral satisfaction from "taming" dangerous groups, such as ISIS, and being able to "take out" current and future enemy insurgents ("evil Taliban") that were responsible for the senseless deaths of civilians in terrorist attacks by often stating that "every dead Tali [Taliban]" was a good thing. Drone technology allowed operators to protect coalition forces on the ground and go after insurgents that attempted to get away after an attack. In a heavily redacted doctoral thesis written by an Air Force lieutenant, the author concluded that "[…] they [mission commanders] saw more battles, saved more lives, and killed more insurgents and terrorists than their airborne peers, and they cherished the relationships they developed with supported ground forces" (Cullen 2011, p. 200). They were thus doing something morally good for the "civilized world," and making the West, especially America, stronger for the sake of global peace and prosperity.

Others questioned the definition of legitimate targets (e.g., 12-year-old males) and what seemed an "arbitrary" authorization of attacks in any area designated as a threat. One drone pilot stated, "By now we hunt wherever in the world we like. We don't care about active warzones any longer and we pick targets which haven't been declared" (Informal conversation 23). "It seems our moral standards have changed since RPA is in town" (Diary 13). Actors often shared their deep moral angst from witnessing deadly "accidents," but being kept in the dark about their mission's eventual outcome.

The account above illustrates how changes in the nature of work—technological, social, procedural, and legal—changed the core meaning of work and problematized its moral legitimacy. Participants had

mixed feelings about these changes, and emotional ambivalence emerged as a key theme from our analysis. We describe below how respondents themselves expressed such mixed feelings.

Emotional Ambivalence from Disruption in Meaning and Moral Legitimacy

Actors described getting "mixed feelings," torn between the positive and negative feelings about their work being disrupted by drone technology that made it hard to discern between good and evil. A sensor operator noted, "I feel both negative and positive about the drone program" (Interview 10). One diarist stated, "The lines of good and bad are blurry. On which side are we standing?" (Diary 20), with actors citing different reasons for the "mixed feelings" (Interview 01). In previous wars, the rules and procedures were less complex and easier to follow. "I mean it was always very clear who was good and bad in the past. Hitler was bad, Saddam was bad, Al-Qaida is bad, Daesh is bad…but now lines are so much more blurred" (Diary 40). In an informal conversation, a drone pilot described the good and the bad.

> "Although using drones can be described as the perfect tool of war…it is clean, relatively precise, and we don't need to send many men into the battlefield, it created huge problems for the American Air Force. What we used to stand for, we are all of a sudden not anymore. [....] It is much messier, blurring lines and much less accurate and with no casualties, as claimed." (Field notes 87)

Continued engagement in the drone program led to a search for answers to "find peace," as actors struggled with the changed meaning of their job and not "knowing if this is good or bad what I am doing." One drone pilot noted, "There was a void that I felt which I had to fill, and the organization wasn't willing or didn't have the ability to fill it" (Interview 19). A sensor operator noted: "At one point after one has had one's own cruel experiences, one comes to the point where you have to evaluate your own moral stance of what the heck you think about all this" (Interview 10). Another operator wrote:

> "It is inevitable to ask the question would I be able to kill this person also face to face. Or am I ok taking somebody's life in cold blood without a chance to run away, fair trial and share his version of the story? (Diary 19).

To varying degrees, all actors reported this "moment" of questioning the meaning and morality of their work. While some cited one particular "pivotal" event (e.g., a major strike that went wrong), others stated it was rather a process of "weeks that I had this question in mind of where I actually stand" (Interview 22) and of "going-back-and forth between my conscience and the sheer fact we live in a brutal world" (Diary 20).

Responses to Emotional Ambivalence

We identified three different coping strategies that actors employed to cope with emotional ambivalence, even if this meant leaving the drone program altogether: (1) adding and modifying meaning, (2) upholding the status quo and ignoring troubling emotions, and (3) exiting the organization.

Adding and modifying the meaning represents a strategy employed by most (23) of the actors involved. In response to the lack of meaning in their work, actors actively modified or added new meaning to working for a military organization. This strategy involved acknowledging that the organization (Air Force) was unamenable to change. For example, actors reasoned, "There are just certain rules of the game that cannot be changed. So, it is our task to see meaning again in our work" (Interview 22).

Actors thus found a way of reconciling themselves to this new form of remote technological warfare. Although they attempted to find meaning within the group, efforts to seek help from supervisors and seniors fell on deaf ears. All such requests were "quickly muted and there was no interest from any side to provide help" (Interview 05). Our respondents confessed that discussing emotions or mental health issues was a taboo topic that "does not belong in the military." They were told to "man up" as "a soldier never shows any weakness" (Diary 23). Voicing emotional distress was not "customary" nor "appreciated in the military." Instead, actors were required to figure it out on their own. A sensor operator stated that he found new meaning in thinking of how drone technology was helping local civilians and that they could, if necessary, "bomb the Taliban to show them who is boss" (Interview 29). A drone pilot wrote in his diary:

> "I am not here to serve the U.S. but make sure little girls like my daughter can go to school around the world. I can be a force of positive change in the world by taking out the bastards of the world one by one. […]. AF [Air Force] has to change because it will be all UAV wars. AF must change in the long run to stay competitive and I can be part of this change" (Diary 05).

Similarly, other actors explained that drone warfare had the same goal as conventional warfare— weaken or destroy the enemy—even if the *means* were different. Drones were described as like any other technological tool but more precise and targeted, causing relatively less collateral damage than conventional warfare and aerial bombing that also killed civilians and unintended targets. Plus, drones made warfare safer for the "good guys." One diarist found "meaning" and was able to continue working for personal reasons.

"I fucking regret the Iraq invasion. We were so wrong. […] I lost so many brothers on the battlefield. […] RPA war is fucked up too, we get wrong people and there is no end to it. […] After end of shift I touch the wobble head of Brian [fallen soldier on a joint mission] and know again why I am fucking doing this pressing-button-war. For him! […] We'll continue this war forever. There is no end mission goal. […] I… don't believe in this shit anymore but [do it] for my [fallen] brothers" (Diary 10).

Actors drawing on this strategy moved from mission-specific goals to privately motivating causes, such as "in the name of my fallen brothers" or "helping little girls go to school," or "making the world a better place." They looked for meaning outside their narrow mission. A technician shared his struggle:

"I shifted my own understanding of what I am doing here. If you ask me if I am ok with killing people. I am ok with killing Tali [Taliban]. Every dead Tali [Taliban] is one less Tali. Yes, I fucking struggle when we get children. Disgust, anger, sadness doesn't even cut it. […] But yes, I am ok if somebody dies by accident if they are in proximity of an insurgent. I mean would you hang with a drug dealer, Nazi, or murderer? What do you expect? I actually don't see myself anymore as a soldier for the USA, but the world. We need to clean the world and remove all those fuckers threatening the Western world and freedom. Not everyone needs to believe in Islam" (Field note 28).

Thus, drone warfare was perceived as being consistent with the military understanding, whose core meaning could be stretched to accommodate remotely conducted warfare.

Upholding the status quo and ignoring troubling emotions refers to a strategy employed by a group of actors (20), in which they purposely disregarded the perceived lack of meaning of their work or their discontent. This meant resorting back to the core meaning of being a soldier and the overarching goal of protecting lives and safeguarding the country against evil forces. In an interview, a drone operator shared the importance of the sanctity of the chain of command and the importance of following organizational hierarchy.

"Where will we land if we question each and every step of the chain. This is how it ran over hundreds of years. We have to trust the system although this sometimes is of course not so easy as to when you are paid to watch children die […]" (Interview 42).

Other actors shared similar sentiments, citing the sanctity of the military tradition, chain of command, and the higher order goals of the military, which helped them to overcome the ambivalence they experienced. This strategy was to disregard any negative feelings from engaging in drone warfare and uphold the ethos of their profession to cope with the emotional ambivalence they experienced. In an informal conversation after a shift, a member shared that coping strategies varied over time.

"To be frank, I have thought about leaving because this UAV stuff is a whole new ball game and tough shit, but in the end am a trained soldier. I belong to the military and serve my country. It is not

my job to decide this or that. I am here to get the shit done. Follow orders and protect the United States of America and ensure that our children can go safe to school tomorrow" (Informal talk 13).

This strategy of upholding meaning was different from adding meaning, as they did not try to justify the use of drones. Rather, they simply upheld the sanctity of the military doctrine to carry out orders in line with the chain of command, as this was what they had signed up for. They often reminded themselves of the need for impassive emotional control, as was inculcated during their training.

Exiting represents the third response strategy in which actors could not come to terms with the disruption of their work by the drone program. They drew upon it as the last resort once they were not successful in deploying the first two strategies. In total, 14 decided to leave the organization from which 9 had been in the "upholding the status quo" group, and the rest from "adding and modifying meaning." Actors noted that they could "no longer emotionally control and avoid their actual feeling of disappointment in the military system and what we are actually engaging in" (Interview 10). Some got disillusioned and decided that their "only option was to leave the Air Force." One member noted, "I could not find a way to motivate myself to go to work." Actors in this group "saw no other alternative than leaving," despite trying. Another actor noted, "I tried to find meaning in this work again, but I simply couldn't" (Diary 07). He further stated:

> "I know of colleagues who have been highly skeptical about our job [in the drone program] but they found meaning again in some other job, or the military mission, or just ignored what is actually going on and did not ask themselves the question what the heck we are *actually* doing here" (Interview 07).

Others cited the loss of purpose due to the moral "unfairness" of the drone program as the main reason to leave the Air Force: "I saw no purpose in my job any longer" (Diary 02). As one described:

> "I can't handle the fact that people are killed because of our fuck-up, and then we send our lawyers in with mourning money and we have to make sure they [providing consolation money] are not being killed by locals. [...] and then we have the fucking guts to give the same amount for a loss of life and a destroyed car [for example in a hellfire attack (reference to a 2010 incident report) relatives received 5,000 USD for loss of life of the family member, and 5,000 USD for a destroyed car]. How to explain this to any taxpayer? We kill them only to then give them money for killing [them]." (Diary 13)
> Actors reported they were unable to "reconcile" those different experiences and had a deep sense of

discomfort from being involved in something not in line "with my understanding of what fair means" (Interview 04). Working in the drone program had severe effects on many actors, including sleep

deprivation, post-traumatic stress disorders, and drug abuse. Many noted "wanting to forget" and "peace of mind" as reasons.

In summary, our analysis allowed us to identify how actors engaged in different response strategies in order to mitigate the emotional ambivalence they experienced. By drawing on one or more of these response strategies at different points in time, conflicted individuals attempted to cope with the emotional ambivalence they experienced and establish a "moral peace," in their own words.

TECHNOLOGY-INDUCED EMOTIONAL AMBIVALENCE AND COPING AT WORK

By drawing on data from multiple sources, including diaries written in situ, we develop a model of how a contentious technology changes the nature of work in at least four ways, unsettles its core meaning and moral legitimacy, and triggers emotional ambivalence, and how in turn, actors draw on different coping strategies in their attempt to repair meaning and legitimacy in their work (Figure 1). We aim to promote analytical generalization (Siggelkow 2007), i.e., to construct theoretical relationships from case findings.

-------Insert Figure 1 here-------

An emerging technology can disrupt work in at least four ways: (1) technological aspects, (2) rules of engagement and procedures, (3) social aspects, and (4) legal aspects.

All four aspects disrupted the nature of work and triggered emotional ambivalence by disrupting the core meaning and moral legitimacy of work. People saw the advantage of the technology-led change in their work but struggled with the disruption in meaning and moral legitimacy (Huy et al. 2017; Tost 2011). We identified three strategies aimed at restoring the meaning and moral legitimacy of work.

The first strategy was to add and stretch the meaning of work in order to accommodate the ambivalent sentiments that arose from the use of emerging technology that brought about a change in work practices. The ambivalence was addressed by reframing the use of the technology and change in work practices as being compatible with the broader organizational and professional mission. In our case, it meant seeing drones as another "means" to achieve the same goal—weaken or destroy adversaries—in the name of protecting one's country and its values, including fighting in the name of fallen colleagues. Often actors achieved this by finding additional arguments for justifying the change to the nature of their work.

For example, they reasoned that drones brought stability and peace to the region or protected the locals from insurgents. Seen this way, the use of drones was no better or worse than the use of conventional weapons, and even has advantages. Consider such competing arguments in the case of genetically modified (GM) foods, where a technology changes the genetic material (DNA) of organisms. While GM foods introduce new risks to food security, environment, and human health—loss of biodiversity, antibiotic resistance, and food allergies—protagonists attempt to reframe GM food as an effective solution to chronic food shortages, the scarcity of environmental resources, and pest infestations.

The second strategy was to disregard the morally questionable aspects of the new technology by upholding the sanctity of the organizational mission. This approach was to sacralize work whose sanctity overrode the use of any practice in the name of serving organizational aims, even if it was morally specious. In our case, the military's purpose to protect its own citizens trumped other considerations about the new technology, including a typical imperative to "not ask questions" and just follow the military doctrine.

Finally, when neither of these approaches to extend the meaning of work or to block out any negative aspects by sacralizing the mission seemed viable, actors coped by exiting the organization. This strategy was based on a refusal to compromise or justify the use of a morally contentious technology and simply leave the organization that deployed it. Given the strong organizational culture, actors had to either adhere to the prescribed rules of the organization or exit. Consider walkouts in companies such as Google, where employees resigned for ethical reasons in protest against the unauthorized exploitation of user data.

The three strategies can be tied to Hirschman's (1970) work on voice, loyalty and exit. Hirschman illustrates that members in different settings (e.g., business, nations, or groups) have three different responses when they perceive a decrease in quality or benefit to their members: (1) They can either voice their concerns with the intent to repair or improve the situation, e.g., through a complaint or a proposal for change, (2) they can exit by simply withdrawing their relationship with the business, nation, or group, or (3) they continue to be loyal despite the perceived discrepancies in quality or benefit.

Although the "adding meaning and modifying meaning" strategy largely pertained to loyalty, in our case, there were also notions of "voice" in so far as actors attempted to raise their concerns and potentially

improve the situation. Hirschman (1970) noted that voice "can be graduated, all the way from faint grumbling to violent protest." In our case, due to strong institutional controls, including the sworn oath to the military doctrine and the need for strong emotional control, voicing concerns about the nature of work or the drone program would have been unacceptable. Voicing is highly discouraged in establishments such as the military and intelligence agencies, where whistleblowing is seen as an immoral act and indictable under the sedition or espionage act, as in the case of Edward Snowden and Chelsea Manning. Two whistleblowers in the drone program, Brandon Byrant and Daniel Hale were charged for leaking classified documents on the drone program's inner workings as documented in *Drone Wars*. In our case, keeping a diary could be seen as an attempt to privately voice concerns and not go public to avoid reprisals.

While Hirschman's notion of voice may have been intended to be more vocal, voice is hard to express in organizations with strong social controls. Consider big tech organizations or the private employees of celebrities or royalty that have to sign non-disclosure agreements that prevent them from voicing their concerns, even if they come across disturbing information and experience emotional ambivalence. Also lawyers need to uphold client confidentiality, and Catholic priests are bound by the seal of confession not to disclose anything about penitents, even if they admit committing horrific acts. In these cases, people may experience ambivalence but carry on, not necessarily due to a lack of concern about what they experience. In one sense, these actors who are inclined to voice but stay silent are acting as "tempered radicals" (Meyerson and Scully 1995)—individuals "at odds with the dominant culture of the organization" and experiencing "enduring ambivalence" (p. 586) but still remaining committed to their organization.

The second strategy, upholding the status quo and ignoring troubling emotions, can be tied to Hirschman's notion of loyalty. In our case, as personnel share a strong sense of belonging to the military community and loyalty to its ethos, they maintain strong social ties within the community even off base. When actors draw upon this response strategy, they engage in strong emotional control (Kahn 2019) to continue working in the organization and simply ignore the disruption in their work. Such loyalty can be seen in organizations with a strong or even cultish culture, such as intelligence agencies, churches, political parties, family firms, and even tech firms. In this category, actors may not perceive their work as a typical

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"day job" to make ends meet, but subscribe to a higher order ideology that cannot be questioned and that overrides any misgivings they may have about their work. Actors abandon or subordinate their own moral positions, which can be an "ultimate" form of socialization or indoctrination into the organization's morals.

The third strategy, exiting, can be tied to Hirschman's notion of exit. When unsuccessful in adding meaning to the nature of their work or upholding the status quo, actors decide to exit the organization as a last resort. In our case, many described "they could no longer be part," or "could no longer hide my emotions." Personnel with a longstanding military affiliation described the difficulty of exiting as former colleagues would see them as "weak" or disloyal, and even cut off ties and longstanding friendships. In this approach, actors engaged in active moral severing, i.e., disassociating themselves from the organization and its ideology, and instead embracing their own moral impetus.

Our model has relevance for other emerging technologies that create moral tensions for people working in high-stakes environments but without clear moral guidance. This may evoke conflicting emotions—both positive, such as hope, pride, and satisfaction that arise from being able to conduct their work more effectively, and negative, such as guilt, shame, and anger (Frankfurt and Frazier 2016) that arise from a violation of moral values. Such emotional ambivalence toward work can also be found in contexts that are not necessarily extreme. In the case of police work, officers have reported feeling ambivalent about the use of AI. Predictive policing enables a shift in emphasis from policing based on engagement with community members toward policing through an algorithmic analysis of the physical crime environment that may undermine human judgment and conceal biases (Brayne 2017).

DISCUSSION

We study how an emerging technology changed the nature of work of military personnel in the drone program. Drone warfare disrupted the core meaning and moral legitimacy of work for people at the forefront of drone operations. This triggered emotional ambivalence—the positive feelings of defending their country against insurgents and protecting the good guys, and negative feelings of being "killing machines" with no "skin in the game" through remotely attacking unprepared targets with no opportunity to defend themselves. We also identify different coping strategies to restore the meaning and moral legitimacy of work.

Our findings allow us to make three contributions. First, we contribute to the literature on emerging technologies (Bailey et al. 2012; Faraj et al. 2011; Leonardi and Barley 2010) by demonstrating the role of emotions (Voronov and Vince 2012) to supplement socio-cognitive (Orlikowski and Gash 1994; Tripsas and Gavetti 2000) and socio-material perspectives (Leonardi and Barley 2010; Orlikowski and Scott 2008), and power lenses (Leonardi and Barley 2010). Technologies may not only embody ideologies, but also impinge on people's moral values, triggering emotions (Gross, 1998; 2015), including those about right or wrong. Although emotions are increasingly attended to in management and organization research, we showcase their role in helping us understand the moral and emotional side of emerging technologies. We show how emotions animate people's interactions with technologies as being meaningful and morally legitimate, and suggest that our understanding of human interaction with technologies is incomplete unless we supplement the focus on cognitions, power and materiality with emotions.

Second, we provide a theoretical model explicating the triggers and consequences of emotional ambivalence following the introduction of an emerging technology. Drawing on Hirschman's (1970) framework of exit, voice, and loyalty, we explain how organizational members use different strategies to cope with emotional ambivalence and attempt to reconstruct their work as meaningful and legitimate by (1) adding to and modifying the meaning of their work, (2) upholding the status quo and ignoring troubling emotions, and if unable to add or upholding meaning, (3) exiting the organization. While the literature on emotions provides an "emotive" view on organizations and organizing by showing how "ambivalence is inherent in organizations" (Rothman et al. 2017), we demonstrate how interaction with emerging technologies produces "emotional" ambivalence. Our model also depicts how actors respond through finding "pragmatic solutions" (Ashforth et al. 2014), or deploying strategies to cope with emotional ambivalence.

Third, while methodological advancements includes analyzing multimodal communication (Meyer et al. 2013), we show the importance of analyzing diary writing as a "technology of the self," where one writes to and for oneself to work upon oneself (Foucault 1982; McDonald 1996). The unique data from diaries allowed us a glimpse into people's "thoughts, feelings, considerations, and reactions" (Radcliffe 2017, p. 190) in real time to infer the underlying meanings not readily discernible from observed behaviors

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and interviews (de Rond and Lok 2016; Zietsma et al. 2018), nor by decoding emotional and non-verbal

cues such as vocal intonations and facial displays (Kemper 1981; Sanchez-Burks and Huy 2009).

LIMITATIONS AND FUTURE RESEARCH

Our study has several limitations, which also provide avenues for future research. First, our findings

may be affected by access to the specific set of diaries from different missions in extreme contexts, such as

Afghanistan where the drone program is active. While these settings are suitable for the research question we

posed, future research can study other types of contexts. For example, we observed little if any effort by

military leaders to provide institutional support for people undergoing emotional distress. In other contexts,

emotional aperture (Sanchez-Burke and Huy 2009)—how organizational leaders recognize diverse emotions

distributed across various groups in an organization—may play an important role.

Second, to protect diarists' anonymity, we refrained from probing into any identity-revealing aspects.

Future research can examine traits (e.g., emotional resilience) in how people cope with emotional

ambivalence. Employees may have felt emotionally ambivalent about specious aspects of their work in

these firms but carried on, reasoning that it was standard practice, sanctioned by seniors, and thus

permissible (McLean and Eklind 2003), or simply kept silent out of loyalty, or a fear of reprisal.

Third, scholars can examine other emerging technologies that have strong emotional and moral

implications, e.g., genome editing. It seems fruitful to look at the emotional and moral side at the

intersection of various emerging technologies; for example, how AI changes the nature of work in the use

of drones, e.g., in the identification of terrorists and insurgents, as well as in other settings characterized by

remote work (Bailey et al. 2012; Leonardi and Treem 2020).

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Figure 1: A model of technology-induced emotional ambivalence and strategies to cope with it
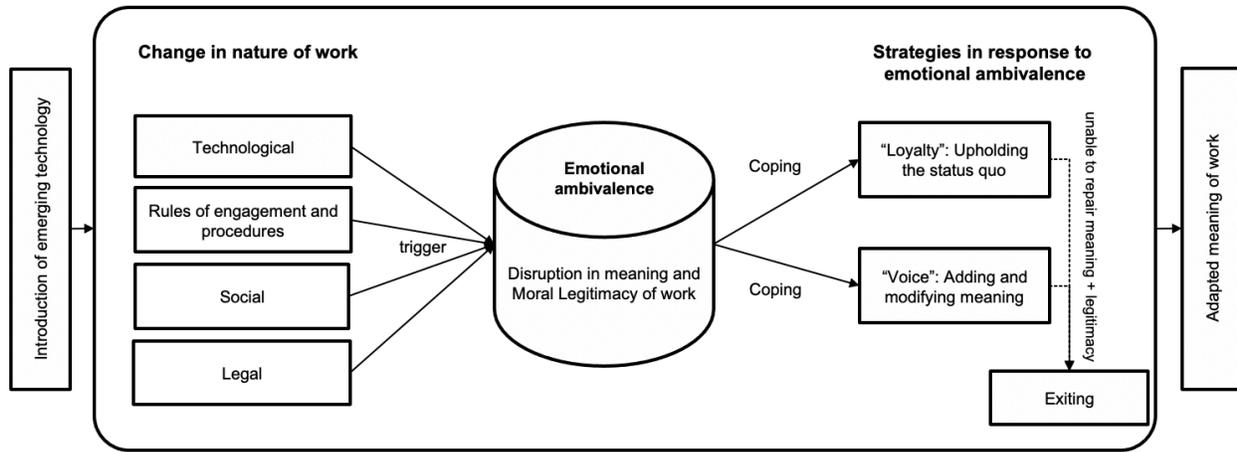

Figure 2: Data structure