Considerations for the Study of Combat-Capable Robots

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Advances in robotics over the past decade have brought the militaries of science fiction to life. Robots are relatively cheap to produce and operate, their strikes are precise, and they involve no risk to the people who control them. Because robot operators are not at risk, these machines create a safer environment for soldiers. Still, scholars question whether the use of robots will incentivize governments to use force rather than diplomacy to achieve their goals. Since there are fewer risks to the lives of soldiers when force is executed by robots than when force is executed directly by soldiers, it is possible that government actors may resort to using force rather than negotiation because their ends are cheaply and quickly achieved by force. The implications for national security are clear: if robots make actors more willing to use force, then government actors will be less likely to use soft power like diplomacy to influence international relations.

Defining and Describing Robots

Robots can broadly be defined as a machine that can take in information, process it, and act on it (Singer 2009 67). This includes, but is not limited to, machines controlled by humans. Robots come in a variety of shapes, sizes, and forms; they can resemble humans or look like machines. Robots are used to complete jobs that are "dirty, dull, or dangerous" (Singer 2009 63, Schornig 2010 2). Although robots can be employed to execute any number of these jobs, this paper focuses on the importance and expanded use of robots for military operations.

Robots are useful for militaries because they reduce costs and provide political cover for leaders using military force (Kreps 2016). One of the most common robots currently used by the U.S. military is the unmanned aircraft system (UAS). UAS used for combat missions are cheaper than comparable manned aircraft (Mizokami 2016, Zegart 2015). More importantly, UAS take American soldiers off the battlefield, completely removing the risk of injury or mortality to the soldiers (Kaag and Kreps 2014, Singer 2009). Individuals piloting UAS are thousands of miles from the combat zone and have zero chance of getting killed by an enemy.

Robots combine the lack of risk to soldiers' lives with the ability to have a close presence to the battlefield, ensuring that military strikes are precise and achieve their goal. Using robots can also limit indiscriminate killing by ensuring the correct target is hit, and technology is advancing to make hitting the correct target a near certainty (Rothenberg 2016). Robots of the future will have facial scanning software that ensures they have located the correct individual (Dillow 2011). Assuming a kinetic strike has not yet occurred, robots can also abort an attack like soldiers choosing not to engage if they determine the target is incorrect (Zenko 2013). These close-up precision capabilities allow robots to be more just than conventional military operations (Emmerson 2013, Strawser 2010).

Robots have the capabilities to become proficient soldiers that lack risks inherent with human soldiers. This creates political cover for leaders looking to intervene militarily in an international crisis (Plaw, Fricker, and Colon 2016). Engaging in conflict is costly to a state in terms of lives and resources lost (Bueno de Mesquita et al 2003, Eichenberg 2005, Perla Jr. 2011). Over long periods of time, these costs may become unbearable for a population, or the public may not see the utility of such actions. However, if robots could fight these conflicts without creating a risk to the citizens of the state engaging in a military operation, then the

citizens may become indifferent to military operations because they do not incur the costs (Kaag and Kreps 2014, Kreps 2016).

However, robot technology has not yet evolved to the point where conflict is completely riskless. There is near consensus that technology like UAS are not currently riskless because they are cost-prohibitive for many actors and cannot operate in "denied areas" (places where there is a strong air defense) (Sayler 2014, Stohl, Brooks, and Abizaid 2014). Still, the key point is how the technology *appears to the public*. If people think that wars fought by robots have no consequences, then they are likely to support the use of force exerted by robots. If one could engage in an action with few risks which, if successful, could create a positive benefit, the public would likely support the action (Kaag and Kreps 2014).

The Double-Edged Sword

Robots have the power to create positive benefits for the international system. As a world superpower, the United States is frequently tasked with addressing security issues such as terrorism and humanitarian crises. However, humanitarian crises are often perceived as a waste of time by a public that does not want to use resources towards a conflict to which they will see little benefit (Eichenberg 2005, Jentleson 1992, Perla Jr. 2011). However, if U.S. citizens are indifferent about sending robots to respond to a humanitarian crisis, the United States could intervene and prevent future problems. Empirically, evidence suggests that this could occur. Walsh and Schulzke (2015) showed for example, that individuals preferred the use of UAS to sending in ground force in instances where the public did not show high levels of support for military intervention.

Yet, robots are a double-edged sword. Robots could also be used to fight internal conflicts or be used to escalate tensions in sensitive areas (Kreps 2016). For example, robots could facilitate the ease with which authoritarian governments maintain domestic control (Horowitz, Kreps, and Fuhrmann 2016). In Syria, Bashar al-Assad has used the Syrian army to kill civilians. Many people in the Syrian army are not willing to kill civilians and end up deserting.[1] This would not happen with robots. Robots would continue killing without regard because they lack emotional capacity.

These scenarios are just examples of the myriad ways in which robots could be used. The important point is that the technology itself allows for endless possibilities. The world could use robots to end humanitarian crises and make the world a better place, or some individuals could abuse the characteristics of robots that make them so appealing to further their individual goals.

Current Research on Robots and New Directions Moving Forward

With the likelihood of robotic warfare increasing, researchers have begun to consider the role of robots in conflict, with research focusing on the use of UAS as a useful starting point. Walsh (2015) looked at the role of American and civilian casualties on support for the use of force using robots, finding that preventing American casualties increased support for the use of force while increasing civilian casualties decreased this support. Horowitz (2016) found some similar results when discussing the autonomous robots. Subjects in this study supported the use of UAS at higher levels if their use could protect U.S. soldiers.

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[1] See http://www.independent.co.uk/news/world/middle-east/aleppo-latest-battle-un-syrian-army-forces-government-regime-kill-civilians-massacre-assad-russia-a7471416.html and http://www.cnn.com/2011/WORLD/meast/07/05/syria.sniper/index.html

Other studies have considered factors that inhibit support for robots. Kreps (2014) found that arguments about how UAS could violate international humanitarian law had a strong impact on support for the use of drones. Kreps and Wallace (2016) showed that arguments about international law could shape public support for UAS more so than discussing the effectiveness of UAS strikes.

While these studies have increased our understanding about preference for robots over human soldiers, none of them focus on the central characteristic of robots: *they reduce the risk of using military force*. None of these studies have attempted to capture the *explicit* perceived risk of using UAS or robots. There is a consensus that drastically reducing risk is the causal mechanism that makes robots different from previous technological advances in warfare, yet no one has explicitly measured risk perceptions and how it relates to support for the use of force.

Moving forward, it will be important to understand the relationship between risk and support when using robots. As stated above, robotic technology does not currently allow actors to use robots to operate in denied theaters of war, but advances in technology make this a strong possibility in the future (Sayler 2014, Stohl, Brooks, and Abizaid 2014). When the threat of losing too many soldiers does not deter actors from using force, how can the United States ensure that other countries do not turn to military force first rather than diplomacy? Do the laws of war need to change? Do costs shift to other considerations when soldiers are not at risk? Is there a limit to how much the public would support the use of force using robots?

These questions are relevant, and need to be discussed now, but there are few cases of states using robots against each other. To mitigate this lack of data, researchers should continue the strategy used by the researchers mentioned above: create hypothetical scenarios and measure how individuals react to each scenario. These scenarios can inform researchers and policymakers

how the public will perceive future military operations without having wait until such a scenario occurs (Croson 2002). While polling data and case studies are useful, there are not enough cases concerning actors using robots in a manner commensurate with these types of studies. The United States is the largest user of robots in military operations, but without a clear comparison to another actor, a case study will not apply generally and will only provide understanding of specific instances. (Hopkins 2010). A large-N study using only data from the United States does not provide sufficient data from which to draw general conclusion. In either case, it is difficult to test whether there is a causal mechanism behind the variables of interest (i.e, risk and support). Therefore, the experimental method is most appropriate to answer the policy concerns currently under study. Experiments serve this need by allowing researchers to establish causality through careful establishment of steps to show that variable X causes Y (McDermott 2002). Experiments allow researchers to explore relationships that will benefit our understanding of using robots faster than using other methods of analysis.

The Implications of Robot Militaries

The importance of studying robots right now lies in the rate at which the technology is proliferating throughout the world. Again turning to UAS, the New America Foundation (Bergen et al 2017) estimates that at least 26 states have UAS that are capable of engaging in combat operations. Half of those states did not have combat-capable UAS five years ago. In addition, 5 non-state actors, most-notably the Islamic State of Iraq and Ash Sham (ISIS), developed their own rudimentary technology capable of dropping bombs and being used as an improvised explosive device. Even if actors do not have the technological capabilities of the most powerful militaries, they still have a new manner of furthering their goals without having to rely on individuals to join their cause; robots are an equalizer.

Conclusion

Robots are poised to revolutionize society by reducing risks associated with dangerous tasks, but this reduction in risk can also remove the constraints on using force. If states can carry out military operations with robots, they may be poised to use force rather than rely on diplomacy. This is not the current reality, as current technology limits the efficacy of robots, but it is important to understand how using robots affects the perception of using force so that we can discover methods to mitigate the possibility of increased, robotic conflict. The issues raised in this paper are just a sample of the problems that may arise from using robots for combat but provide a good starting point to begin to understand how robots will affect international relations.

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