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Unmanned and Ungoverned:
Drones, Post-Human Warfare, and the Implications of Pursuing Military Efficiency at the Cost of Jus in Bello

Jack Duran (CLA 2015)

Ardant du Picq, a French colonel and military theorist, once wrote, “To fight from a distance is instinctive to man. From the first day he has worked to this end, and he continues to do so” (du Picq 112). These words still hold true. The development of new military technologies has, in many ways, served this end. To this day, military personnel are being increasingly distanced both physically and mentally from the battlefield (Singer 328). Indeed, the recent rise in the development and use of combat unmanned aerial vehicles (UAV), otherwise known as drones, in contemporary armed conflict by the United States has exponentially facilitated this trend. Why has this been the case? Simply put, Moore’s Law. Moore’s Law observes that computing power will double in capacity every two years (Singer 328). These technological advancements have given rise to a new revolution in Military Affairs that is fundamentally changing the conduct of contemporary warfare. It comes as no surprise, then, that combat drones, whose capabilities are driven by computing power, have become—and will continue to become—more powerful and more efficient in their capabilities with time. This has led some scholars, and especially roboticists, to go so far as to make claims that the growing technological efficiency provided by robotic systems such as combat drones will, consequently, lead to increased efficiency in implementing *jus in bello*—the international law that governs the just conduct of war and its effects on non-combatants. Because of the exponential advancements in military technology, such scholars argue that combat drones can, in fact, be more ethical than actual human beings in their conduct in the theatre of war. This increased efficiency in implementing *jus in bello*, they claim, removes the need for human decision-making in battle.

Proponents of this claim, thus, make a case for moving human military personnel “out of the loop” by completely distancing them away from the battlefield and supplanting human presence with supposedly more efficient robotic systems. The growing use of robotic systems such as combat drones to fuel this distancing trend has led to a new

phenomenon that robo-ethicists have called "telepistemological distancing," which has allowed human military personnel to safely operate tele-operated systems miles—and sometimes thousands of miles—away from the actual battlefield (Sullins 268). However, because of the exponential advancements in military technology, the phenomenon of "telepistemological distancing" is evolving to such a point that there is now a push away from tele-operated drones (operated by humans) and toward developing lethal autonomous drones (LAD) that operate *without* human intervention. This change threatens to introduce a new stage soon in the revolution in Military Affairs: post-human warfare. This is, however, no cause for joy. The increased technological efficiency of combat drones does not necessarily correspond with an increased efficiency in implementing *jus in bello,* as some suggest. To intimate such a spurious relationship would be grossly misleading. Indeed, those who make such claims gravely miscalculate exactly who benefits most from the technological efficiency that combat drones provide—non-combatants on the receiving end of a drone strike or, in fact, human military personnel on the offensive end.

Undeniably, the foremost purpose of a state in using combat drones—as the term suggests—is not to protect noncombatants on the receiving end, but rather to strike at enemy combatants in an effort to increase its relative military advantage. Indeed, when a state is faced with an opportunity to increase its relative military advantage, it is likely that *jus in bello* considerations will largely be swept aside because such considerations would constrain any potential military advantages. While the efficiency of combat drones provides a military advantage to military personnel on one side of a conflict, the supplied advantage is so disproportionate that it conversely increases the risks to those on the receiving end of a drone strike—particularly noncombatants. Thus, this essay argues that the pursuit of an efficient military advantage by way of combat drones lowers the threshold of the resort to force governed by *jus ad bellum*—the international law that determines the just resort to military force—which, ultimately, undermines the principles of necessity, discrimination, and proportionality required by *jus in bello*. Because human judgment—which hinges on an inherent value for human life—is a necessary constraint on the just resort to force, the growing trend toward post-human warfare, in which humans are increasingly supplanted by combat drones on the battlefield, does not serve to make *jus in bello* conduct more ethical, but rather war

more efficient to wage. Such a trend, rather than reinforcing *jus in bello* conduct, will ultimately erode it.

The Nature of Combat Drones Under International Law

Despite the controversy surrounding combat drones, they, as robotic systems with no human consciousness, judgment, or motives, are not *mala in se* or innately "evil." They are, therefore, like all other military technologies, incapable of intentionally inflicting harm. However, a weapon, while not "evil" in nature, can very well be indiscriminate in nature—a characteristic that would lead it to be banned by international law. Indeed, Article 36 of the 1977 Additional Protocol (I) to the Geneva Conventions of 1949 states that in the development and acquisition of a new weapon, a "High Contracting Party," or a party state, must determine that it does not violate the protocol by acquiring weaponry that is inherently indiscriminate and does not cause unnecessary injury and suffering (ICRCa). Yet, despite all the controversy surrounding combat drones, there is nothing in any existing international legal instrument to date that explicitly prohibits the use of combat drones. This is likely because combat drones are not inherently indiscriminate in the way that cluster munitions are, for instance. Instead, combat drones provide a technological efficiency that is markedly absent in a majority of conventional weapons. Some claim this efficiency inherently leads to greater precision and accuracy—a claim they use to defend the use of drone strikes as being compliant with *jus in bello* by nature. They insist that combat drones are innately ethical. But if this is true, why then has a heated international controversy arisen over their use in warfare? The technological efficiency provided by combat drones *may* lead to more necessary, proportionate, and discriminatory uses of military force. However, this does not suggest that combat drones are innately ethical and that they inherently *cause* increased *jus in bello* compliance. Correlation, in this case, does not by any means imply causation. Those who make such claims neglect the fact that only when combat drones are used in compliance with *jus in bello* will increased *jus in bello* compliance follow. Combat drones cannot themselves cause this.

As they are currently being used, combat drones are tele-operated systems that are controlled remotely by human military personnel. In other words, humans are currently still very much "in the

loop." While the unmanned characteristics of combat drones are certainly a step-change from conventional manned aircrafts, the systems themselves, as neither *mala in se* or innately ethical, are currently not the cause of the international legal controversy that surrounds their use, but rather how their human operators are using them. In other words, the issue currently concerns the nature of the motives of their human operators. As combat drones increasingly become more autonomous to the point of becoming agents, the international controversy will, then, increasingly focus on the nature of combat drones in themselves—whether they, as inhuman systems, will be inherently capable of complying with the principles of necessity, proportionality, and discrimination. As it currently stands, drone strikes by the Central Intelligence Agency (CIA)—which according to the Bureau of Investigative Journalism have killed as many as 1,060 civilians in Pakistan, Somalia, and Yemen combined—have been covertly conducted by human operators and have eluded scrutiny and accountability for potential *jus in bello* violations (Serie 2015). Indeed, a prime example of how the use of combat drones can run afoul of *jus in bello* is the CIA's "signature strike" campaign, in which individuals exhibiting physical features of a combatant—but who may not necessarily *be* a combatant—are targeted and killed without any concrete evidence and accountability, potentially unjustly denying noncombatants their right to life (Miller). In one example, a wedding procession in Yemen believed to be convoys containing al-Qaeda operatives was struck by a combat drone, killing at least 35 civilians (Ross).

While tele-operated combat drones are not themselves indiscriminate in nature, their weakening effects on the threshold of the resort to force can, indeed, lead their human operators to use them in an indiscriminate manner that runs counter to the dictates of international law. In this regard, because responsibility for international law violations currently lies with the human operator, the issue at hand is holding humans accountable for their willful violations of international law. Thus, tele-operated combat drone systems in themselves do not violate the existing international legal framework that governs the conduct of war because humans decide their actions for them. Yet, this will not always be the case, as combat drones advance enough to be able to act independently of their human operators. Those who claim that combat drones are innately more ethical than humans would likely have no concerns over this growing trend, assuming that such systems can be highly trusted to comply with *jus in bello*. But this is a fallacious

assumption that if acted upon would unnecessarily and recklessly risk the lives of innocent non-combatants. The growing effort to use combat drones in lieu of humans will prove to have a high ethical cost on *jus in bello* compliance. And as technological advancements outpace the applicability of international law, such advanced systems will evade responsibility for *jus in bello* violations. Indeed, because *jus in bello* is based on considerations of humanity, the more that humans distance themselves from the battlefield in favor of inhuman, autonomous systems, the less value that *jus in bello* will have for constraining the effects of war on non-combatants. This poses a serious challenge not only to the rule of international law, but also to the principle of humanity that undergirds international law and which requires the humane treatment of all people in times of war.

The Ultimate Sacrifice: Pursuing Military Efficiency at the Cost of Humanity

The principle of humanity, or the law of humanity, is widely held in international customary law, especially in *jus in bello*. Rupert Tieshurst describes how the principle is generally interpreted as restricting the means and methods of war that are not necessary to the attainment of a military advantage or necessity (Tieshurst). In other words, the principle of humanity serves to condemn and constrain the unnecessary use of force that would cause superfluous injury or suffering. The principle is a guiding post for the *jus in bello* principles of necessity, proportionality, and discrimination in constraining military advantages and limiting the effects of armed conflict on non-combatants and alleviating suffering. Ronald Arkin, however, argues that, "[i]n the fog of war it is hard enough for a human to be able to effectively discriminate whether or not a target is legitimate. Fortunately, it may be anticipated… that in the future autonomous robots may be able to perform better than humans under these conditions" (6). Proponents of increased "telepistemological distancing" of humans away from the battlefield, such as Arkin, suggest that the technologically efficient capabilities of combat drones, in fact, prevent superfluous collateral damage to non-combatants more than humans themselves will ever be able to. As such, they argue that such robotic systems—devoid of human emotion and motive—can reduce the inhumanity in war and thus would not only adhere to the principle of humanity, but would also, ironically, outperform actual humans in doing

so (Schmitt and Thurner). Arkin has even gone so far as to claim that robotic systems such as combat drones can be morally programmed and engineered to comply with *jus in bello* (7).

It would, however, be misleading to suggest a causal relationship between technological efficiency and morality, as Arkin does. As technologically efficient as combat drones may be, they do not possess human judgment and, thus, cannot be moral agents in the way humans are. Just as such systems cannot be *mala in se,* they cannot be innately ethical. Thus, they cannot be morally programmed, as Arkin suggests, to be more ethical and outperform humans in complying with *jus in bello*, despite best efforts to do so. Claims that argue otherwise are wholly unsubstantiated. Rather, it is how humans *choose* to use such systems that, ultimately, determines how ethical and compliant with *jus in bello* a combat drone may be. Because combat drones provide such significant force protection, as they diminish the risk to a state's human military personnel, it is tempting for states to use combat drones as a means of lethal force in pursuit of an efficient military advantage. Indeed, idealistic claims that combat drones can *cause* increased *jus in bello* compliance and can be morally programmed to ethically outperform humans in doing so neglect the fact that, to the detriment of the principle of humanity, *jus in bello* considerations fall a distant second to a state's desire to pursue an efficient military advantage.

Bradley Jay Strawser, in contrast to such idealistic claims, provides a rather realistic claim for why combat drones should be used. He argues that it is "morally imperative" to use combat drones not because such systems are innately more ethical than humans and will cause increased *jus in bello* compliance, but rather simply because such systems protect human military personnel—whom he calls "justified warriors"—from unnecessary risk (344). To Strawser, the technological efficiency provided by combat drones should serve first and foremost to protect the lives of military personnel, arguing that, as a result, the use of combat drones is not suspicious, but rather "ethically obligatory." In such a way, combat drones are seen as the perfect response to unconventional threats—they can do the dull, dirty, and dangerous jobs that human military personnel do not want to do or are less efficient in doing (Merchant 275). Strawser believes that forcing human military personnel to do these jobs, especially the dangerous ones, puts them at an unnecessary risk. Jai Gallion, however, argues, in response to Strawser, that diminishing the risk to

one's military personnel through the use of remote weaponry by one side against another side without the same technologically efficient capabilities substantially increases the risk to the less-capable side—making the conflict asymmetric and, ultimately, unjust (59). Indeed, as Christian Enemark argues, "[c]ontrary to the spirit of *jus in bello* discrimination, the lives of U.S. combatants at home are valued more highly than the lives of noncombatants in the vicinity of a drone strike," (377). This is extremely problematic for the rule of the principle of humanity over the conduct of warfare. How, then, could it be argued, as Strawser does, that the use combat drones is not suspicious? Certainly, if their use is in the name of an efficient military advantage, it may not seem so. This is especially true if one considers their actions to be "justified," even when they may not be so. It is unsurprising, then, that Strawser uses the phrase "justified warriors" to refer to military personnel who use combat drones. However, *justness* is a concept that has for too long a time been pliable to the motives of those who make claims to it in pursuing a military advantage. And for far too long innocent civilians have suffered as a result.

It is for this reason that scholars like Arkin claim that because humans can harbor unethical intentions, a robotic system such as a combat drone—devoid of human emotion and motive—can perform more ethically and more compliantly with *jus in bello* than humans if such systems were autonomously operated. To such scholars the technological efficiency of LADs is the logical answer to the ethical issues concerning war and, more specifically, *jus in bello*. While, to be certain, human error and motive determine how ethically a tele-operated combat drone may be used, it is, however, far from the case that the behavior of LADs will be any more compliant, ethical, and restrained than that of a human operator. Indeed, the more that humans are pushed away from the battlefield in favor of increasingly autonomous, morally devoid systems incapable of even understanding *justness*, the less necessary, proportional, and discriminating the use of such military force will be in the pursuit of an efficient military advantage in a post-human war. In a post-human stage of warfare, then, the lives of non-combatants would, conceivably, be valued even less—eroding the principle of humanity. At such a point, one could conceive of such systems no longer as human tools of warfare, but rather as autonomous agents. Yet, because LADs are incapable of being moral agents in the way humans are, they threaten the very basis of international law by circumventing conventional conceptions of responsibility for *jus in bello* violations.

Autonomy and Responsibility: Accountability Issues in a Post-Human War

It is easy to imagine the introduction of autonomy into warfare as the moment robots rise and break free from the shackles placed on them by their human overlords. The fear that we may not be able to control such systems has led many to compare them to the likes of the *Terminator*—referring to them as indiscriminate "killer robots" (Singer 2009,165; Lokhorst and van den Hoven 145). Yet, these concerns, while exaggerated at best—and informed more by science fiction than reality—reflect a strong, reasonable concern about what will happen when the next stage of remote warfare—post-human warfare—arrives and humans lose their operational control to a seemingly more efficient and powerful computer system. Although LADs are still on the drawing board, they will inevitably become a reality—and very soon. A study by Project Alpha, a U.S. Joint Forces Command analysis group, suggests that LADs may be on the battlefield as early as 2025 (Johnson 5). Despite concerns, a synthesis of du Picq's observation and Moore's Law suggests that LADs are a natural progression and logical endpoint of technological advancement in remote warfare. The emergence of such systems in warfare, therefore, should not come as a shock. In fact, many weapons today, such as the U.S. Patriot and Phalanx anti-ballistic missile systems, possess semi-autonomous features and settings that do not require human intervention, but rather are operated by a computer system at certain levels (Grut 22; Heyns Apr. 8). As they are currently used, many drones are semi-autonomous as well. While human operators control them, in many cases drones have the capabilities to take off and land autonomously, for instance. In other cases they can even fly a prescribed flight path autonomously as well. Indeed, there are many—and often rather dull—functions that a drone can do more efficiently autonomously that would not be as efficient for a human operator to perform.

The ethical issue with autonomy arises when a robotic system such as a drone reaches a certain level of autonomy where it is ultimately given lethal decision-making power not only in targeting, but also in conducting a kill strike without human intervention. Anti-missile systems, as described above, are already given this level autonomy for the most part. What, then, distinguishes LADs from other weapons that

kill at distance? This is a question that Rob Sparrow considers, arguing that the ethical issues which are raised by combat drones are not unique to it and that such systems are not different from other weapons that kill from a distance, such as rifles (3). Strawser, as well as other scholars who are proponents of combat drone use, also make this claim (Strawser 343; Schmitt and Thurnher). However, such a conclusion is misinformed and, above all, shortsighted. It completely ignores the relevance of Moore's Law and the fact that technological progress will increasingly distance humans from the battlefield in the next few years to such an extent that an irrevocable change in the conduct of warfare will occur. Indeed, a LAD with the capability of flying its own path and deciding to strike independently is a weapon unlike any other previously introduced on the battlefield. That a LAD could fly itself virtually anywhere in the world—inside and outside of conflict zones—with the power to target and fire autonomously is more than just a little unsettling. To give a combat drone such lethal autonomy would mean that it would have to be highly trusted by humans—perhaps even more so than their own human judgment—in order to make such decisions for itself responsibly without human intervention.

The tragic example of the 1988 downing of an Iranian civilian passenger jet that killed 290 civilians by the U.S.S. *Vincennes*' Aegis anti-aircraft computer system, which mistakenly identified the aircraft as an F-15 fighter jet, shows why placing such a high level of trust in a lethal autonomous system does not, in fact, lead to fewer illegitimate killings, but more (Singer 125). The Aegis system was programmed to pursue a military advantage as quickly as possible. Yet, the system was so efficient in the task of swiftly protecting U.S. military personnel that it did not and could not have the time to hesitate and take into account *jus in bello* criteria and, above all, the principle of humanity in its lethal decisions. If crewmembers had made use of their hesitation and human judgment to second-guess the system's F-15 classification of the aircraft, then it would have been more likely that the airliner and its civilian passengers could have been spared. But the crewmembers trusted that the system was correct according to its sensors—at least more correct than their own human judgments—and allowed the system to fire by not intervening in its decision-making process (Singer 125; Grut 15). The Aegis system's malfunction is a prime example of how such autonomous systems, lacking in human judgment, fundamentally do not possess the ability to adhere to the *jus in bello* principles of necessity, proportionality and discrimination.

Sensors provide an extremely mediated and context-lacking view of the battlefield that can negatively skew lethal decision-making. Indeed, with a mediated view of the battlefield and no human conscience and judgment to be able to discern between right and wrong, just and unjust, combatant and non-combatant, the lethal decisions made by a LAD would be taken much more lightly than if an actual human operated it. Restraint in the resort to force, thus, hinges vitally on a sense of hesitation that only moral judgment and an intrinsic value for human life can provide. Such restraint is intrinsically informed by the principle of humanity. Yet, LADs, devoid of human judgment, inherently lack a value for human life and, thus, restraint—a fact that could very well endanger the lives of noncombatants.

Robotic systems, however, are not inherently at fault for lacking such restraint. Indeed, just as LADs cannot be *mala in se,* they can neither be innately ethical—incapable of possessing human motive. After all, how could they be if they—as inhuman objects—cannot understand and appreciate the value of human life? Their behavior can either be pre-programmed or they could malfunction. Either way, a LAD, unlike a human, would have no way of understanding the meaning or consequence of the actions it decides to take—whether commanded or malfunctioned. In the event that a LAD violates *jus in bello,* for instance, by lightly deciding to strike an innocent civilian, who is to be held responsible for this violation to the right to life? If the human is still "in the loop" and the combat drone was human-operated, then, of course, responsibility would lie with the human who ordered the strike. To be sure, the existing international legal framework that governs the conduct of war is currently very capable of holding humans accountable for *jus in bello* violations. But once the human is moved "out of the loop" and LADs are given full operational control over their flight plans and lethal strike decisions, where, then, does responsibility lie? The machine? If a combat drone is neither *mala in se* or ethical *per se* and has, as a result, no human motive and understanding of the consequences of its actions, how, then, could such a machine be held accountable under international law? Would the engineer, the programmer, manufacturer, or a commanding officer, then, be held accountable? If the machine's violations were a result of a technical malfunction and not a result of a legitimate military command, can a human reasonably be held responsible under international law for the actions of a "rogue" machine?

The lesson to draw from these critical questions is that responsibility to make lethal decisions requires a great deal of trust—which up to today has been trusted to *human*s trained in the rules and conduct of war and, thus, are able to be held accountable under international law. Indeed, to be given the responsibility to conduct a lethal strike means that one must be able to be held responsible for the consequences of that strike. Yet, if a machine cannot be fully trusted in its capabilities to be restrained and humane, its decisions cannot be responsible. It could be argued, then, that LADs, incapable of determining the necessity, proportionality, and discrimination principles of *jus in bello*, may very well be inherently indiscriminate and in violation of the Additional Protocol (I) to the Geneva Conventions. As matter of logic, such systems should not be given the autonomy and responsibility to make such lethal life and death decisions. To knowingly do so in an effort to gain a military advantage would be an egregious violation of the principle of humanity.

Indeed, how could the computer software of a LAD be trusted to have the capability to consider all the intelligence humans review, in addition to consideration for context, domestic law, international law, and ethics among a long list of other concerns in order to make a responsible decision? A computer system capable of doing so would require nothing less than artificial intelligence on par with human intelligence—something Arkin believes is possible to engineer. Mary Ellen O'Connell argues that "[t]oday it appears well within the realm of the possible that computers will be programmed to be capable of doing what experienced battlefield lawyers currently do," (232). She also asserts, however, that essential human qualities like a conscience are beyond possible. It is unclear whether we will be capable of programming a truly artificially intelligent system with near human capabilities and even more so if we will be capable of morally programming it (Grut 20). Until such a time, then, LADs will remain inherently and fatally flawed—wholly incapable of complying with the stringent principles of necessity, proportionality, and discrimination of *jus in bello*. To forgo *jus in bello* responsibilities and deploy such technically flawed systems with the expectation that they will inherently cause increased *jus in bello* compliance would be recklessly—and even criminally—negligent. John P. Sullins astutely states:

> We should be entirely confident of the abilities of these systems before trying to quickly deploy them as weapons before we are certain of their impact on the

> ethics of the battlefield, as battle is one of the most ethically fraught of human activities, and in doing so we have not made the battlefield safer for non-combatants caught in the crossfire (274).

The introduction, however, of such advanced military technologies into the battlefield for a quick military advantage ultimately comes at the cost of understanding what the long-term ethical impact will be of using such weapons. To the extent that combat drones are a tool to humans operated *by* humans, the use of combat drones—if properly used—could indeed assist humans in improved compliance with *jus in bello*. However, to the extent that combat drones become so autonomous that they, in fact, become independent agents on the battlefield—assuming the role of post-human combatants—such systems, ungoverned by and unaccountable to humans, would very well threaten the existing international legal framework that governs the conduct of warfare. In an era in which such powerful systems are increasingly being developed and deployed at a quicker pace—and thus challenging and outpacing existing conceptions of ethics and law—the nature of warfare is, accordingly, changing at a much quicker pace as well. These changes undermine the applicability of the existing international legal framework that governs war. Therefore, the need to adapt international law to confront the ethical challenges that such autonomous systems are presenting has never been more pressing.

Re-conceptualizing the Nature of War under International Law

In a widely publicized report submitted to the UN General Assembly, United Nations (UN) Special Rapporteur for extrajudicial, arbitrary and summary killings Christof Heyns wrote that the existing international legal framework, which has been developed over centuries, is an "adequate framework" for governing drone strikes (Sept., 22). The existing legal framework that Heyns refers to is simply what is known as the Laws of War, which is composed of both *jus ad bellum* and *jus in bello* criteria. The Geneva Conventions and its Additional Protocols and the United Nations Charter, for instance, form the foundation of these criteria. Undoubtedly, the existing legal framework is mostly adequate to govern the existing use of human-operated combat drones today, as humans are still "in the loop." Yet, with the growing push to take humans "out of the loop," this will not

always be the case and autonomy will be standard sooner rather than later—according to Project Alpha, by 2025 (Johnson 5). How, then, could it be argued that the existing international legal framework—already stretched as it is with the current use of human-operated drones—will be adequate to govern and hold accountable the conduct of LADs in a new post-human stage of warfare? Such a claim is informed by the very same logic that informs Sparrow's conclusions—that drones are no different from other existing weapons that kill at a distance, are not a step-change in the conduct of warfare, and therefore do not warrant the adaptation of the Laws of War.

Indeed, it was only every so often in history that new weapons technologies initiated revolutions in Military Affairs, irrevocably changing the conduct of warfare and the existing nature of war itself. For instance, viewed as an inhumane weapon, the crossbow—as a distance-killing and sharp shooting weapon that pierced the armors of soldiers and challenged the chivalric order—brought such an asymmetry to the battlefield that Pope Urban II banned its use by Christians in 1139 (Dockery 12). It was the first attempt at a weapons ban in Europe. The subsequent introduction of the cannon, the rifle, and the atomic bomb, for instance, were all new, emerging advanced technologies that, at their introduction to the battlefield, essentially changed the rules of the "game." Today we live in a world in which technology, as Moore's Law suggests, becomes more powerful every two years—giving rise to an unprecedented growth in technology. The exponential advancements, for instance, that the General Atomics MQ-1 Predator drone has gone through since its introduction to the battlefield in 1995 as a surveillance drone to becoming what former CIA director Leon Panetta called the "only game in town," is quite extraordinary (Panetta). Not only has the use of combat drones changed the "game," it is, in fact, the *only* "game."

Despite the rapid technological advancements of the combat drone in recent years, armed UAVs, contrary to popular thought, had been introduced into warfare as early as 1849. Austria had attacked Italian insurgents in Venice in 1849 by launching unmanned balloons loaded with explosives—what is considered to be the first aerial bombing raid (Farwell 75). The use of drones today, therefore, is no shock as it is simply a natural technological progression from the unmanned explosive balloon that Austria once launched. After the small-scale use of explosive balloons in warfare in the latter half of the 19th century, it took 58 years for a multi-lateral international declaration

to be drafted in 1907 that prohibited the discharge of explosives from such balloons (ICRCb). Yet, around the time the declaration was passed new military weapons were being developed and produced, such as poison gas and tanks, among others—many of which would be introduced into battle in World War I. Indeed, such technological sophistications only served to make war more efficient to wage and less constrained—further exacerbating non-combatant casualties and devastation more than any explosive-loaded balloon could ever possibly inflict. It also shows that advancements in technology, more often than not, outpace the grasp of the existing international legal framework of the time. This very fact has never been more accurate than it is today—a time in which the speed of technological advancements is constantly challenging the applicability of international law.

The problem with the existing international legal framework, which Heyns suggests is adequate to govern the use of combat drones, is that it assumes not only that all combatants are humans, but also that this will always be the case. This is a naïve assumption at best, and a dangerous one at worst. There is, to the deadly negligence of such assumptions, a growing, yet troubling interest, in taking humans completely "out of the loop" and toward a post-human stage of warfare. Not only does this undermine the very principle of humanity that grounds *jus in bello*, but it also means that uses of force by LADs will lie outside the bounds of existing international law—unable to be held responsible for potential *jus in bello* violations. The implications are far too great to take lightly, especially as more countries seek to develop and acquire such technology for their own use (Bergen 102). It is crucial to understand that the nature of warfare is fundamentally changing and that technology is exponentially facilitating this change.

Noel Sharkey has, as a result, argued for an international ban on LADs before they are introduced onto the battlefield (96). But to expect agreement, much less compliance, with an international ban is vastly unrealistic. States seeking new, more efficient means of increasing their relative military advantage will likely disregard the ban. Simply put, the introduction of LADs will not wait for the international community to deliberate on whether they comply with the existing international legal framework or not. The technological advancements of LADs will make it so that the existing international legal framework will become outdated by the time such systems are introduced to the battlefield. However, international law can adapt to confront the ethical

challenges posed by the use of LADs by seeking to modify the foundations of the Laws of War to take into account the use of increasingly autonomous lethal systems in contemporary warfare and their effects on non-combatants. This could be a first step toward establishing an international regime to govern the use of lethal autonomous systems in war. Indeed, as technology outpaces international law, it is crucial for states like the U.S.—currently the world's most prolific user of combat drones in armed conflict—to take the helm in developing a new international legal regime on the use of such systems in order to reinforce, rather than further undermine *jus in bello*.

Conclusion

Can combat drones be capable of being more humane and ethical than humans in the theatre of war? Some scholars have certainly made claims that combat drones' technological advancements can, indeed, lead them to be more ethical and compliant with *jus in bello*—advocating for the use of LADs that require little to no human intervention. Scholars such as Arkin make more robust claims, asserting that such systems can be programmed with a set of moral standards that could, in fact, exceed those of humans. But the causal logic that informs their claims, however, is wholly unsubstantiated and ultimately neglects to consider how "telepistemological distancing" trends to distance humans from the battlefield can, in fact, lead to less compliance with *jus in bello*'s principles of necessity, proportionality, and discrimination. As the case with U.S. drone strikes shows, the technological efficiency that combat drones provide does not necessarily increase *jus in bello* compliance, but rather serves to increase one's military advantage. As such, "telepistemological distancing" lowers the threshold of the resort to force to such an extent that, while diminishing the risk to military personnel on one side, conversely increases the risk to non-combatants on the receiving end of a drone strike.

The growing drive to introduce LADs in armed conflict, then, threatens to introduce a post-human stage in warfare—something that will greatly erode considerations of humanity that should frame all uses of force. Such considerations fundamentally require restraint and human judgment in order to make a responsible decision. However,

devoid of such judgment, LADs are not only incapable of complying with the *jus in bello* principles of necessity, proportionality, and discrimination, but are also incapable of even determining these principles when faced with making a responsible decision. The absence of moral agency in such systems, thus, poses a great challenge to the rule of international law. The need to address the ethical concerns posed by such systems and codify it into an updated international legal framework is crucial before their use becomes widespread among states. Otherwise, such systems—despite the technological efficiency they may provide—will continue to undermine the humanitarian principles of international law, because such military efficiency will, if ungoverned, only serve to exacerbate the effects of war, rather than contain them.

Works Cited

Arkin, Ron. "Governing Lethal Behavior: Embedding Ethics in a Hybrid Deliberative/Reactive Robot Architecture." *GVU Technical Report* GIT-GVU-07-1.1. (2007). GVU Center, Georgia Institute of Technology.

Bergen, Peter. “Drone Wars: The Constitutional and Counterterrorism Implications of Targeted Killing.” *Terrorism: Commentary on Security Documents (The Drone Wars of the 21st Century: Costs and Benefits)*. 133. Ed. Kristen E. Boon and Douglas C. Lovelace, Jr. Oxford: Oxford University Press. 2013. 89-151. Print.

Dockery, Kevin. *Stalkers and Shooters: A History of Snipers*. New York: The Penguin Group, 2006. Print.

Du Picq, Charles-Jean-Jacques-Joseph Ardant. *Battle Studies: Ancient and Modern Battle.* London: The Macmillan Group. 1921. Print.

Enemark, Christian. “Drones, Risk, and Perpetual Force.” *Ethics & International Affairs*. 28.3 (2014):. Print.

Farwell, Byron. *The Encyclopedia of Nineteenth Century Land Warfare: An Illustrated World View*. New York: W. W. Norton & Company. 2001. Print.

Gallion, Jai. “Uninhabited Aerial Vehicles and the Asymmetry Objection: A Response to Strawser.” *Journal of Military Ethics* 11.1 (2012):. 58-66. Print.

Grut, Chantal. “The Challenge of Autonomous Lethal Robotics to International Humanitarian Law.” *Journal of Conflict and Security Law* 18.1 (2013): 5-23. Print.

Heyns, Christof. “Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns.” *United Nations General Assembly*. A/HRC/23/47 (9 April 2013).

Heyns, Christof. “Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions.” *United Nations General Assembly*. A/68/382 (13 September 2013).

ICRCa. “Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977.” *Ircr.org.* International Committee of the Red Cross, 1977. Web. 2015.

ICRCb. “Declaration (XIV) Prohibiting the Discharge of Projectiles and Explosives from Balloons. The Hague, 18 October 1907.” *Icrc.org*. International Committee of the Red Cross, 1907. Web. 2015.

Johnson, Gordon. “Unmanned Effects (UFX): Taking the Human Out of the Loop.” U.S. Joint Forces Command, 2003.

Lokhurst, Gert-Jan and Jeroen van den Hoven. “Responsibility for Military Robots.” *Robot Ethics: The Ethical and Social Implications of Robotics*. Ed. Patrick Lin, Keith Abney, and George A. Bekey. Cambridge, Massachusetts: MIT Press, 2012. 145-156. Print.

Merchant, Gary et al. “International Governance of Autonomous Military Robots.” *Columbia Science and Technology Law Review*. 7. 2011.

Miller, Greg. “CIA Seeks New Authority to Expand Yemen Drone Campaign.” *Washingtonpost.com*. The Washington Post. 18 April 2012. Web. 2015.

O’Connell, Robert L. *Of Arms and Men: A History of War, Weapons and Aggression*. New York: Oxford University Press, Inc, 1989. Print.

Panetta, Leon. “Director's Remarks at the Pacific Council on International Policy.” *Cia.gov.* Central Intelligence Agency, 18 May 2009. Web.

Ross, Alice K. 2014. “Civilians die in reported Yemen drone strike as weekend of attacks kills at least 35.” The Bureau of Investigative Journalism. London, U.K. 21 April. 2014. Web.

Serie, Jack. “Monthly Updates on the Covert War.” Thebureauinvestigates.com. The Bureau of Investigative Journalism. 2 Feb. 2015. Web.

Schmitt, Michael N. and Jeffrey S. Thurnher. “Out of the Loop”: Autonomous Weapon Systems and the Law of Armed Conflict.” *Harvard National Security Journal* 4.2 (2013). Web.

Sharkey, Noel. “The Evitability of Autonomous Robot Warfare.” *International Review of the Red Cross*. International Committee of the Red Cross (ICRC). 886. 30 June 2012. Web.

Singer, P.W. *Wired for War: The Robotics Revolution and Conflict in the 21st Century.* New York: Penguin Press, 2009. Print.

Singer, P.W. 2012. “The Robotics Revolution.” *Brookings.edu*. Brookings Institution. 11 Dec. 2012. Web. 2015.

Sparrow, Rob. “Robotic Weapons and the Future of War.” *New Wars and New Soldiers: Military Ethics in the Contemporary World.* Ed. Jessica Wolfendale and Paolo Tripodi. Surrey, U.K.: Ashgate, 2011. 117-133. Print.

Strawser, Bradley Jay. “Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles.” *Journal of Military Ethics*. 9:4 (2010): 342-368. Print.

Sullins, John P. “RoboWarfare: can robots be more ethical than humans on the battlefield?” *Ethics and Information Technology* 12.3 (2010): 263-275. Print.

Tieshurst, Rupert. 1997. “The Martens Clause and the Laws of Armed Conflict.” *International Review of the Red Cross*. International Committee of the Red Cross (ICRC).317. 30 April 1997. Web. 2015.

The Rock: A Master of Rhetoric?

Tyler New (Towson University, CLA 2015)

I. Introduction

"The Rock[1] says this: 'You should know your role and shut your mouth. Take a little walk down Know Your Role Boulevard, hang that right on Jabroni Drive, and then proceed to check your Aunt Jemima, no-pancake-havin'-ass directly into The Smackdown Hotel" (*This Is Your Life*). Among other rhetorical techniques, Dwayne "The Rock" Johnson used inventive, impromptu lambastings like this to assert dominance over competitors who posed threats to his reputation during the prime of his wrestling career. In the case above, he rejected fellow World Wrestling Entertainment (WWE) wrestler Mick Foley's (Mankind) guest on Monday Night Raw.[2] The WWE is predicated on struggles for power, and I argue that The Rock became both powerful and popular in the WWE company because he is a master of rhetoric. While other notable wrestlers such as Andre the Giant and Hulk Hogan relied mostly on one or two rhetorical devices, the Rock employed several, including identification, call and response, and vilification. His control of three of the five canons of rhetoric—invention, style, delivery—and his use of various rhetorical devices is not present in many wrestlers who preceded or followed the prime of his career.

This paper examines The Rock's mastery of rhetoric as it relates to his mastery of rhetorical strategies, and it examines rivalries The Rock had with "Stone Cold" Steve Austin and John Cena from a rhetorical perspective. Each of these rivalries is unique, and each reveals different tactics The Rock used to maintain power. Sometimes, The Rock vilified his opponents; other times, he stripped them of their

[1] Referring to oneself in the third person is common in the WWE.

[2] Mankind had disrespected The Rock in the previous WWE segment and threw The Rock a birthday party (entitled "*This is Your Life*") in the middle of a match to apologize. Several influential people from The Rock's past—his high school football coach, his ex-girlfriend and his sixth grade home-economics teacher—were brought to the ring. The Rock rejected all three with monologues similar to the one at the beginning of this paper. By doing so, he refused to accept Mankind's apology—a move that put The Rock back into a position of power.

identities. The Rock also manipulated his opponents' identities to present them in ways that undermined their manhood. Such tactics are part of the reason why The Rock was such an effective rhetorician—and such a powerful and popular wrestler. Without The Rock, the entire WWE company has lost popularity. During the height of The Rock's career in 2001, for example, average ratings reached as high as 5.7. In 2009, the highest ratings reached only 4.1 (TWNP News). Examining The Rock's rhetoric is necessary when trying to understand what traits make a successful WWE wrestler—and, perhaps, what traits are necessary when creating a WWE superstar who can resuscitate the company's dwindling popularity. The root of The Rock's popularity, and arguably any WWE wrestler's popularity, is a mastery of rhetoric. The Rock's rhetoric also reveals WWE fans' perceptions of masculinity; he understands the fans' notions of a 'real man,' and he tailors his rhetoric to appeal to them.

II. The Rock's Background

Despite The Rock's inherent athleticism, he was not always popular in the WWE. The Rock won an NCAA football title playing for the University of Miami, and his father and grandfather both wrestled professionally (*The Rock: The Most Electrifying Man in Sports Entertainment*). Marketing The Rock as a "face"—someone heroic or "good"—then, made sense, and he tailored his image to what he thought the crowd wanted. He went by "Rocky Maivia"[3] and was booed incessantly in his early matches—and his poor standing with the fans wore on him. The nice guy image was not suited for Rocky Maivia; he needed either to change his image or to leave the WWE. The Rock was worn down by the verbal abuse (which is ironic, considering the methods he eventually used to gain popularity) of the fans and contemplated quitting the sport. They would chant, for example, "Die rocky die" (*The Rock: The Most Electrifying Man in Sports Entertainment*).

The WWE decided to turn Rocky Maivia into a "heel," someone villainous, or "bad," and in 1998, he decided to change his wrestling name to "The Rock." He was still booed during his matches, but the

[3] "Rocky Maivia" is a combination of The Rock's father's and grandfather's wrestling names (*The Rock: The Most Electrifying Man in Sports Entertainment*).

dynamics between The Rock and his audience changed. He embraced the crowd's animosity and returned its taunts. The Rock felt more comfortable as a wrestler once he dropped his good-guy act and began functioning as an entertainer—as himself—and his rise to superstardom began. He became the leader of the "Nation of Domination," a powerful wrestling faction in the WWE from 1996 to 1998. The WWE often creates a persona for each individual wrestler that determines the rhetoric he (or she, in the case of divas) will use to become popular. The Rock created his own image through embracing the heel role, and through this image he also created his own, unique rhetorical schema.

III. The Rock, WWE, and Rhetoric

One may wonder how The Rock qualifies as an exceptional rhetorician—or even how he can be considered a rhetorician at all. Rhetoric is politics, a means of deception—and it has a certain level of sophistication, right? And duplicitous schemers are the only individuals to employ it? Though rhetoric can be used to manipulate people, doing so is *not* its primary purpose or function. Rather, rhetoric is a means of persuading others, whether for benevolent or dubious purposes. Aristotle's definition of rhetoric will guide my discussion of The Rock as a rhetorician: "the faculty of discovering in any particular case all of the available means of persuasion." This definition is apt because The Rock employed varied means of persuasion during the prime of his career in efforts to "be the man." He was known for wearing pricey silk shirts to the wrestling ring, coining terms that remain part of U.S. vernacular and dictionaries ("Smackdown,"[4] "Jabroni," "Roody Poo "Candyass") and creating signature wrestling moves (The People's elbow). All of the aforementioned tactics were means of crafting The Rock's image and making him favorable in the eyes of WWE fans. Every method The Rock used to make himself more popular—his speech, his dress, his wrestling moves—is a form of rhetoric. Rhetoric is more than just persuasive writing and persuasive speech; rhetoric is any means used to persuade others.

[4] The Rock's term "Smackdown" was introduced into Merriam-Webster's dictionary in 2007 (*Merriam-Webster)*.

Though The Rock can be abrasive and does not resemble what one may think of as a typical rhetorician (consider erudite philosophers Socrates and Foucault, or social reformers like Malcolm X), he does use the same rhetorical strategies they do—and sometimes more effectively, one could argue. The WWE frequently featured The Rock on Monday Night Raw, a live segment that drew up to eight million viewers per episode in the late 1990s and early 2000s. He rarely prepared scripted lines: The Rock gained popularity partly because of his ability to produce clever catchphrases extemporaneously, leaving viewers rarely knowing what to expect. This mastery of invention helped set him apart from other wrestlers. The Rock also used strategies such as identification, vilification, and call and response when directly asserting dominance over other wrestlers. His delivery was also key to his success vis-à-vis both his moves and his elocution.

IV. Invention

Quintilian's and Cicero's ideas about invention, or *inventio*, will guide my discussion of The Rock's extemporaneous speech. The function of speech, Quintilian argues, is "in the main concerned with the treatment of what is just and honorable" (Quintilian). The Rock is not necessarily concerned with the justness and honorability of others' actions in the way Quintilian intended, but these ideas are indeed central to the purpose of The Rock's rhetoric—he just has different ideas about what justness and honorability mean.

These ideas about justness and honorability revolved around manhood—a concern that shaped The Rock's impromptu lambastings. Being recognized as a manly man is of paramount importance in the WWE; only the manliest of men deserve to don a championship belt. It is unjust, then, for someone who does not demonstrate aggression and virility—a "Roody Poo Candy Ass", as The Rock would say—to become a champion. These ideas about what constitutes a manly man are socially constructed and are based on an extremely narrow and conservative definition of masculinity. Researcher Danielle Soulliere, University of Windsor, concluded that the WWE sends four messages about masculinity: "1) Real men are aggressive and violent 2) Men settle things physically 3) A man confronts his adversaries and problems 4) Real men take responsibility for their actions" (7). The

Rock understands the narrow, conservative definition of masculinity and the four messages sent by the WWE—and he exploits them ruthlessly. When doing so, he often relies on *inventio*.

Quintilian broke inventio down into three forms: logical proof, ethical proof and pathetic proof (Golden 87). Logical proof is an appeal to the audience's rational side. It involves fact, definition, and quality (Golden 87). Arguments can be made or broken based on any of these three factors. Perhaps the most relevant form for "The Most Electrifying Man in Sports History" is pathetic proof, which is connected to the idea of pathos. Because The Rock did not usually employ logic in his lambastings ("Roody Poo Candy Ass" is not an insightful, penetrating assessment of one's character) and because he derived his ethos partly from his ability to electrify the crowd, pathos (or, pathetic proof) is most relevant when analyzing The Rock.

Quintilian said of compelling pathos: "There is room for addresses to the feelings. The nature of the feelings is varied, and not to be treated curiously; nor does the whole art of oratory present any subject that requires greater study" (Quintilian). The Rock recognizes, just as Quintilian did, the importance of entertaining the crowd above all other forms of rhetoric. Pathetic proof is about exciting the crowd and making its members emotionally invested in the message being delivered. Pathetic proof appeals involve humor and laughter, both factors that The Rock employs in his performances.

The Rock clearly recognizes the importance of entertainment and *inventio*—but how did he apply that knowledge in the prime of his WWE career? As mentioned previously, The Rock frequently entered the ring without having memorized any of his lines. The most famous and representative example of this is his participation in the "Rock-N-Sock"[5] connection on September 27, 1999, when the segment *This is Your Life* achieved a RAW all time high 8.4 rating, or eight million viewers (*The Rock: The Most Electrifying Man in Sports Entertainment*). The Rock's introduction was only supposed to take a few minutes[6], but he and Mankind extended that portion of the segment to over twenty minutes. WWE CEO Vince McMahon grew increasingly

[5] The "Rock-N-Sock" connection was a tag team duo featuring The Rock and Mankind.

[6] WWE introductions involve wrestlers walking out to music, posing for the crowd, and sometimes taking a few moments to talk to the audience, too. The whole process usually does not exceed five minutes.

more agitated as the act progressed, as other events were scheduled to take place (*The Rock: The Most Electrifying Man in Sports Entertainment*). The Rock produced some of the WWE's most memorable monologue and lambastings in these twenty minutes, and none of them were prewritten. Consider The Rock's reaction to his old football coach being brought out to the ring and offering to shake his hand:

> How you doin' coach? (The Rock ignores the coach's outstretched hand.) Coach, uh, you remember the last game of the season? When there was two minutes left in the game, and The Rock made that quarterback sack? And the quarterback went to high five The Rock and The Rock says 'oh no no no no! The Rock doesn't high five, but he will do this.' And The Rock Boot and TTD'd him right in the middle of the field?!? You remember that? [Pause as the crowd erupts.] Yeah, I'm sure you do, but, instead of congratulating The Rock, uh, you made The Rock run sprints that night after the game—right in front of all The Rock's fans. (Crowd boos.) Hey coach, that's a really nice whistle you have around your neck. Coach, is that the same whistle that, uh, you used that night? You mind giving a little blow—just one time—for The Rock? (Coach blows whistle) With you in mind, coach, The Rock would like to do something special with that whistle. The Rock would like to take that whistle you got—the very same one you just put to your lips—shine it up real nice, turn that *expletive* sideways, and stick it straight up your candy ass! (*This Is Your Life*)

As with the quote in which The Rock rejected Mankind's special birthday guest (the quote that opened this essay), The Rock also rejects Mankind's apology by rejecting Mankind's special guests on the segment. Despite the sizeable audience and the program's spontaneity, The Rock demonstrates creativity, inventiveness and composure. He is performing live in front of thousands of people in the arena and eight million viewers on TV, and he is able to craft a narrative that not only entertains the audience but also includes it without showing any signs of nervousness. He does this three separate times to three separate guests—people from his past who he was not expecting to see that night—and created the most popular RAW segment of all time. The increase in viewers from the start of RAW to

the end is more than can be accounted for by 100 percent of the viewers of rival WCW World Champion Wrestling (WCW) Nitro fans switching to watching RAW.[7] The spike in viewers suggests that people were likely calling their friends to tune into the show, as social media and other forms of online advertising were not yet relevant. This increase in viewers throughout the segment is a testament to The Rock's ability to electrify his audience and make its members excited about his message. The dramatic increase in numbers being unrelated to The Rock's performance is improbable; he likely was responsible for the most popular RAW segment of all time. Such is the talent of this impactful rhetorician. The effects of this performance speak volumes about the impact invention can have. Not only can one perform successfully without preparation (provided one is talented enough to do so), but one can also gain respect—and therefore, in most cases, ethos—because one performed without preparation. A significant contribution to The Rock's spike in popularity was his "This is Your Life" performance, and it was executed without preparation; perhaps his inventiveness endeared him to the crowd. Should this be true, other rhetoricians, particularly those in the performing arts, can learn and benefit from his rhetorical techniques.

This performance was effective not only because of *inventio*; it was also effective because it appealed to the conservative definition of masculinity (and the WWE's four messages about masculinity) discussed earlier. The Rock proves he is a manly man by reinforcing the WWE's third message about masculinity: a man confronts his adversaries and problems. The Rock had a problem with his football coach, and he let the coach know that this problem was unacceptable. Rebelling against his old football coach also plays into masculine fantasies—particularly those of teenagers—relating to power and respect. The coach humiliated The Rock, so The Rock humiliated him back—on an even grander stage.

V. Style

The Rock's style is unlike any other rhetorician's. He does not rely on sophisticated diction or vocabulary, or even any other means of

[7] This means that even if every single WCW fan stopped watching its Monday Night special and starting watching WWE RAW, the increasing in RAW viewers still could not be fully accounted for.

elevating himself above his competition. He relies, instead, on vocabulary that involves his fan base, particularly on vocabulary that includes his fan base in his success. Whether The Rock defeats the Russian Rusev or the American John Cena, "The People" are partially responsible—or so they think. Perhaps more importantly, The Rock understands the views and attitudes of his audiences and considers them when performing; this is why he so directly appeals to the four messages of the WWE and to the masculine fantasies his fans harbor.

Consider the speech below when The Rock made his most recent return to the WWE on October 6, 2014. Though this speech is not, obviously, taken from the prime of his career, he employs the same rhetorical strategies—identification, call and response—that he did between 1997 and 2004 to connect with the crowd. It is worth noting that The Rock is half African American, and the call and response technique is historically the provenance of African-American rhetoric (Golden 446). It is also worth noting that The Rock may have performed this, too, without prior preparation. Indeed, the WWE Live TV website notes that The Rock was not even listed in early versions of the Monday Night RAW script; he may have ended up in the ring incidentally after arriving in the area for other business (*The Rock Makes Surprise Return to WWE Raw*). The Rock said the following to the Russian wrestler Rusev and his wife Lana, who were trash-talking the U.S.A., upon arrival:

> Rusev and Lana. Right now, we need you to do two things: that's know your role, (Pause, crowd finishes: "and shut your mouth!")…
> The Rock flew to one place, and that place was The Big Apple (Pause as crowd applauds and begins chanting "Rocky!") Then The Rock arrived at the Barclay's Center, walked down that ramp, walked into this ring—The People's Ring—in front of the millions (Crowd explodes: "And millions!") of The Rock's fans so he can proudly say, 'Finally—The Rock has come back to Brooklyn!' (*The Rock Makes Surprise Return to WWE Raw*)

The first thing The Rock does in this speech is use the call and response technique. What individualizes The Rock's call and response technique, however, is the fact that he does not explicitly ask the crowd to repeat him—the crowd already has a relationship with him and

knows what he usually says. Though master rhetoricians such as Malcolm X also traveled from place to place and built rapport with their audiences, none had collections of catch phrases that were recited by the crowd without prompting. Every word in the speech, as is the case with everything else The Rock says in the ring, is designed to deepen his connection with the crowd. He is lauded for admonishing the Russian Rusev, but he involves the crowd in that admonishing, allowing the crowd to share in his success. Notice also how The Rock includes the crowd from the very beginning of his speech: "Right now, we need you to do two things."

The Rock also personalizes his opening speech to his location and gears it towards the fans. His diction changes depending on where his match is being held, and he uses new speeches every time he visits. So, when visiting the Barclay's Center, for example, The Rock opens with a different speech than when he was last there. The Rock tailors his narrative on this segment (he talked about waking up early, working out, flying to NYC and visiting four of New York's boroughs before visiting the center—a narrative he had not told before) to the occasion—he leads up to his reason for facing off with Rusev.

The rest of the speech shown above is geared towards insulting Rusev; The Rock insults his preference for wearing tight, high waisted shorts by saying, "The Rock likes to work out too, but he doesn't wear shorts pulled up to his nipples! You're runnin' around here makin' everyone look at your Moscow Moose Knuckle!" (*The Rock Returns to Raw and Attacks Rusev*) The Rock employs humor to further build his rapport with the crowd—or, even, to identify with it—and strip Rusev of his Russian pride or identity. The Rock also appeals to American democracy as he attacks Rusev in this confrontation. He garners support of "the people" as he attacks and effeminizes his Russian opponent.

Perhaps the most noteworthy word in The Rock's vocabulary is "people"; he uses this word to identify with the crowd. Throughout The Rock's wrestling career—both in his prime and in each of his comeback appearances—The Rock has included the word "people" in his monologues, catchphrases, nicknames, and even in the names of his moves, in efforts to have "the people" identify with him. He refers to the wrestling ring as "The People's Ring" in the above quote, giving "the people" ownership of the object that helps give him power. The Rock similarly names his most popular signature move "The People's

elbow."[8] No matter what The Rock accomplishes in his WWE career, he gives fans credit. If he wins a match after using his finisher signature move, they contributed to his success. When The Rock came out of retirement in 2011, he gave the fans credit for his success in Hollywood and cited them as the reason for his return (*The Rock: The Most Electrifying Man in Sports Entertainment*). He has even referred to WWE fans as "The Rock's backbone" (*The Rock: The Most Electrifying Man in Sports Entertainment*). The Rock has used "the people" as support for his attacks on other wrestlers. Consider part of his attack on John Cena:

> You fight for them [wrestlers]; I fight for them [people] (Points to crowd, crowd chants Rocky). You hear them John? I fight for them. I fight for the people… you see, John, when the people and I get together, we create; we innovate. We trailblaze![9] When The Rock came back, and he told you that you look like a big fat bowl of fruity pebbles, this is what they did: they started chanting fruity pebbles! And then all of a sudden, we find you on the cover of a cereal box![10] (Crowd chants "fruity pebbles.") (*RAW: The Rock Responds to John Cena*)

This excerpt shows how integral the crowd is to everything The Rock does in the ring. Not only does he include "the people" in his success, but he uses them as part of his attacks on other wrestlers—attacks that beget success. The Rock strives to include the crowd so much that doing so is a reflex; he actually does rely on his audience. Not only does The Rock include the people in his attack, but he gives them credit for Cena's sponsorship. The effect is threefold: The Rock is built up, John Cena is torn down, and the people are given credit for both. Putting "the people" first—before himself, even—has proven incredibly effective for The Rock. He remains a skilled rhetorician partly because he makes a point of garnering the support of his audiences and identifying with them; despite being depicted as a

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[8] Signature moves often define a wrestler; they are how the wrestler assumes his power.

[9] This event was held in Portland; The Rock may have been alluding to the city's basketball team "Trailblazers."

[10] When The Rock called John Cena a "bowl of fruity pebbles" in a previous segment, #fruitypebbles trended on social media. Once the higher ups in Post Foods, the producer of Fruity Pebbles, found out why #fruitypebbles was trending they offered John Cena a sponsorship deal to appear on the cover of the cereal box.

heel, The Rock has built a career in which people root for him. One could argue that The Rock earned his self-proclaimed title: "The People's Champ." One should note, though, that "The People" are granted a purely fantasy power in such situations—their cheering does not influence who will win each match they watch.

VI. Delivery

The Rock has certainly been a master of *inventio* and style throughout his wrestling career. His rhetorical strategies have usually been consistent with ideas posited by Cicero and Quintilian. I assert in this section that The Rock's delivery is also supported by the ideas of Quintilian, and I suggest that delivery may be The Rock's biggest rhetorical strength. I draw on Quintilian's work *Institutes of Oratory*, which discusses gesture, decorum, management of breath, and variety and tone of voice, among other things. Each part of the human body is also discussed.

The Rock's delivery in his addresses to the crowd was both electrifying and measured. Of course, throughout his career, The Rock's delivery was focused on involving the crowd. Consider the first lines of the monologue he delivered when he returned to the WWE in 2011 after seven years of retirement:

> After seven, long years—(Pause as crowd applauds.]—finally! [Pause, crowd applauds.] Finally! [Pause, crowd applauds.] Finally! The Rock has come back to Anaheim! [Crowd erupts.] Which means finally—The Rock has come back to Monday Night RAW! Which means finally—The Rock has come back….home [Crowd erupts]. (*Dwayne "The Rock" Johnson Makes His Return To The WWE After 7 Long Years!*)

Quintilian said delivery "ought to exhibit three qualities: it should conciliate, persuade, and move, and to please will be a quality that naturally combines itself with these" (Quintilian line 154). The last lines of The Rock's return speech meet all three criteria, and the result (pleasing the crowd) is evident through the crowd's overwhelming applause. Perhaps the most important part of The Rock's delivery speech—an aspect that is present in almost all of The Rock's

performances—is how he ends it. The Rock throws his head back, raises the microphone above his head as if he is chugging a bottle of water, and softly utters "home." The Rock assumes this pose to emphasize the most important part of this message softly, though. He emphasizes that he is back in his roots and is there to stay (which he explicitly says later in the speech). This message is emotional and relatively deep—it transcends the sophomoric banter and superficial drama characteristic of the WWE. The message of the speech and its delivery conciliated, persuaded, and moved the crowd because of the gestures and the tone and variety of voice The Rock used while delivering it.

Considering what has been said of The Rock in this essay—that he single-handedly boosted a Monday Night RAW special to the most popular of all time, that he has mastered several rhetorical techniques—concluding that he has achieved the modern day equivalent of Greek actor Demetrius is reasonable. Consider Quintilian's assessment of the actor: "In some, excellences have no charm, while in others, even faults are pleasing… To wave the hand in a particular way, to prolong exclamations in an agreeable tone to please the audience, to puff out the robe with the air on entering the stage, and sometimes to gesticulate with the right side could have been becoming in no actor but Demetrius, for in all these respects he was aided by a good stature and comely person" (Quintilian line 160). The Rock is 6'5 tall and 260 pounds; he fits the physical requirements for being able to do what he wants. But The Rock was also aided by his ability to deliver powerful exhibitions and speeches. After establishing himself as an electrifying entertainer, The Rock could do no wrong. I draw this comparison to complement my assertion that delivery was The Rock's most valuable asset; it is because of his ability to captivate his audience through gesticulations and voice inflections that he gained the influence he did. The influence of The Rock is seen in his ability to set trends—and, outside the ring, become an international superstar.[11] If The Rock was not as skilled at delivery, an argument could be made that he would not be as popular as he was in his prime or is now.

[11] The Rock has been featured in numerous movies and is usually in the top 10 highest paid actors each year. In 2013, for example, he was the highest paid actor in the United States (Forbes).

VII. Rhetoric and The Rock's Rivalries

The Rock employs rhetoric, just as every other WWE wrestler does, to trounce his opponents. What separates The Rock from other wrestlers, though, is his control of multiple rhetorical techniques. He employs them to reinforce the most important messages in the WWE about himself: to be the man, you have to beat the man. "The man" is the toughest wrestler in the ring and in the WWE company; The Rock reinforces and controls the messages the WWE sends about manhood in his favor. He excites the masculine fantasies of his viewers by acting them out (consider *This is Your Life*). If The Rock does not take control of the manly aspect of his image, he risks losing his spot as a champion, as a popular WWE figure and as, one could argue, a master rhetoric. These three factors are intertwined: WWE champions are almost always popular figures, and they become popular—or some, at least—through the rhetoric they employ. The Rock would not be a master rhetorician if he could not outdo his opponents in rhetorical battles (consider the bouts The Rock had with John Cena and Stone Cold Steven Austin, described below).

The Rock reinforces the WWE's four main messages about masculinity, discussed earlier, through his style, delivery and *inventio* almost every time he steps into the ring. Consider, for example, his feud with wrestler John Cena. The Rock insulted John Cena, and the two then trash-talked each other for weeks before meeting in person. When they finally met, Cena verbally attacked The Rock as an individual, saying "Dwayne Johnson is self-centered, egotistical…and wouldn't care if this company closed its doors tomorrow," and then left the ring. The Rock's response reinforced the messages of the WWE and employed rhetorical strategies, rather than relying on personal attacks:

> It's like you John. It's like you to come out, run your mouth, and then walk away before I smack the lips off your face…but let me tell you this: The Rock, Dwayne Johnson, Dwayne Johnson, The Rock—that is the same man. The same man in here is the same man out there [In Hollywood, in real life.] But the difference between me and you, John, is you come out here, you run your mouth about being tough, but you're not. The bottom line is this: The Rock, Dwayne Johnson, The People's Champ, The Great One, The Most Electrifying Man in all

> of Entertainment—it doesn't matter John!—the only thing that matters is that what I'm gonna do on the biggest stage of WrestleMania, the biggest matchup of all time, The Rock and all the nicknames you wanna throw—Team Bring It Worldwide[12]—we're gonna kick your candy ass all over WrestleMania! (Crowd erupts, The Rock assumes dramatic pose) If you smell what The Rock is cooking! (Raw: The Rock Responds to John Cena)

The Rock uses several rhetorical strategies in his retort against John Cena: he identifies with the crowd, he involves the crowd using the call and response technique, and he reinforces all four of the WWE's messages. He also uses Quintilian ideas regarding delivery—he assumes a pose that connotes the importance of the message he is about to deliver. Most notably, though, The Rock calls Cena out on his lack of manliness. Considering that manliness is of paramount importance in the WWE—and considering that one's ethos relies almost entirely on one's manliness—The Rock's response is apt and more effective than any personal attack could be. His response shows that Cena is not confronting his problems, especially not physically—rather, he is literally walking away—and he is not taking responsibility for his defamatory comments against The Rock.

The Rock's most effective rhetoric, arguably, is seen in his rivalry with wrestler "Stone Cold" Steve Austin. He headlined three WrestleMania pay per view (PPV) events with Austin, one of the most popular figures in WWE history—more popular, arguably, than Andre the Giant, Hulk Hogan, or even The Rock himself. The two wrestlers had similar careers: both made their WWE debuts in 1996, and both won Intercontinental championship belts before becoming figureheads of the WWE's "Attitude Era" (*The Rock: The Most Electrifying Man in Sports Entertainment*). The WWE website lists The Rock v. Stone Cold rivalry as the best in wrestling history (*WrestleMania 10 Greatest Rivalries*). Consider what The Rock says about Stone Cold before a steel cage hell-in-a-cell match:[13]

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[12] The Rock points to the crowd as he says this—he includes them in his declaration of victory.

[13] Five wrestlers fight each other in a cell in hell-in-the-cage matches. The first wrestler to escape the cage wins.

> Or maybe The Rock has gotta beat Stone Cold Steve Austin [Puts on camouflage baseball cap, starts talking in Southern accent]—which means I gotta get in my pick-up truck, drink some Steve-weisers, listen to some Backstreet Boys…and that's the bottom line—cause The Great One said so! (*The Rock Makes Fun of Stone Cold Steve Austin*).

Stone Cold's image was centered on being the manliest of rednecks. He would frequently crush beer cans with his head—opening both his head and the cans—and would then drink the remaining alcohol in the middle of his matches. The Rock often made fun of such behaviors and painted them as being inane and pointless. Perhaps the most important line in this mockery, though, is The Rock's comment about Stone Cold listening to the Backstreet Boys. According to Soulliere, "Men in the WWE assert their manhood by questioning the manhood of others" (7). The Backstreet Boys were a music group with fanbase made up predominantly of teenage girls. Saying that Stone Cold listened to the Backstreet Boys, then, attacks his manhood and places him with perhaps the most unmanly demographic in the United States. Also, saying that Stone Cold listened to the Backstreet Boys may have been meant to imply that Stone Cold is homosexual. Such slurs and jabs were not uncommon in the late 1990s, and some viewed homosexual men as less manly than heterosexual men. One could argue that The Rock was both vilifying Stone Cold and stripping Stone Cold of his identity in this comment. The Rock turned Stone Cold's assets into weaknesses by mocking them—instead of Stone Cold being a manly redneck, he is a foolish, effeminate character. A wrestler's identity is vital to his success and popularity. By stripping Stone Cold of his manly, redneck identity, The Rock builds himself up. The Rock becomes more popular as Stone Cold loses popularity.

VIII. Conclusion

Rhetoric is often dismissed as empty flattery, vacuous prose, or manipulative speech. The Rock's wrestling career—specifically the prime of his career—shows that rhetoric can transcend such stereotypes and views. While calling someone a "Roody Poo Candy Ass" is not the most virtuous use of one's rhetorical abilities, The Rock coined such phrases to entertain his audience. Such insults were

almost never meant personally—he called John Cena, for example, a "great man," and said that his rivalry with Cena was meant to promote the WWE and entertain fans (*RAW: The Rock Responds to John Cena*). The Rock's mastery of several rhetorical techniques helped bring both himself and the WWE to new levels of popularity; he asserted himself as one of the most powerful and popular wrestlers of all time through his control of rhetoric. Hopefully The Rock's iconic status in U.S. culture serves as a testament to what effective rhetoric can do—how it can bring people together. Can you smell what The Rock is cookin'?

Works Cited

"A Sampling of New Words and Senses from the New 2007 Update of Merriam-Webster's Collegiate® Dictionary, Eleventh Edition." *Merriam-Webster*. Merriam-Webster, n.d. Web. <http://www.merriam-webster.com/info/newwords07.htm>.

Dwayne "The Rock" Johnson Makes His Return to the WWE After 7 Long Years! Perf. Dwayne Johnson. World Star Hip-Hop, 15 Feb. 2011. Web. <http://www.worldstarhiphop.com/videos/video.php?v=wshh74j8Eel7p68CTb6n>.

Golden, James L., ed. The rhetoric of Western Thought. Kendall Hunt, 2003.

Melok, Bobby. "WrestleMania's 10 Greatest Rivalries." *WWE*. WWE, n.d. Web. <http://www.wwe.com/shows/wrestlemania/wrestlemania-10-greatest-rivalries>.

Omerantz, Dorothy. "Dwayne Johnson Is The Top-Grossing Actor Of 2013." *Forbes*. Forbes Magazine, n.d. Web. <http://www.forbes.com/sites/dorothypomerantz/2013/12/16/dwayne-johnson-is-the-top-grossing-actor-of-2013/>.

Quintilian. "Book 6 - Chapter 12.": *Quintilian's Institutes of Oratory*. N.p., n.d. Web. <http://rhetoric.eserver.org/quintilian/6/chapter12.html#150>

Quintilian. "Book 11 - Chapter 3.": *Quintilian's Institutes of Oratory*. N.p., n.d. Web. <http://rhetoric.eserver.org/quintilian/11/chapter3.html#150>.

RAW: The Rock Responds to John Cena. Perf. Dwayne Johnson and John Cena. Wrestlinginc.com. WWE, n.d. Web. <http://www.wrestlinginc.com/wi/news/2014/0913/580974/the-rock-says-he-and-john-cena-nearly-came-to-blows/>.

The Rock Returns to Raw and Attacks Rusev. Perf. Dwayne Johnson, Rusev and Lana. *YouTube*. WWE, n.d. Web. <http://www.youtube.com/watch?v=Pv1nRwONwK8>.

The Rock Makes Surprise Return to WWE. Perf. Dwayne Johnson. *WWE.com* WWE, 7 Oct. 2014. Web. <http://www.wwelivetv.com/the-rock-makes-surprise-return-to-wwe-raw/13143>.

The Rock: The Most Electrifying Man in Sports Entertainment. Dir. Kevin Dunn. Perf. Dwayne Johnson. WWE, 2008. DVD.

Soulliere, Danielle M. "Wrestling with Masculinity: Messages about Manhood in the WWE." *Sex Roles* 55.1-2 (2006): 1-11. Web.

This Is Your Life. Perf. Dwayne Johnson and Mick Foley. 1999. *WWE.com*. WWE. Web. <http:www.wwe.com/video/playlists/rock-this-is-your-life-playlist>.

Structural Analysis of G Protein-Coupled Receptors: Deorphanizing the GPR174 Receptor

Saif Yasin (CLA 2017)

It is the pervading law of all things organic and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, that form ever follows function. This is the law.

—Louis H Sullivan

Introduction

Structure of Molecular Machines

Architect Louis H Sullivan posits in his essay, "The Tall Office Building Artistically Considered," that a building's structure will determine how society utilizes it (Sullivan 1896). This architectural theme is also evident in biology—a protein's function is based upon its specific conformation, so function and form are indeed correlated (Sleator 2012). Biology is dependent upon atoms building upon each other piece by piece in a predetermined form to create the macromolecules that are primarily responsible for functional biology, which can be termed the "machinery of life." (Goodsell 2009)

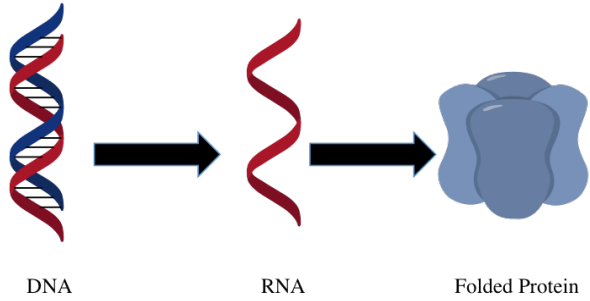


Figure 1- Pictorial Representation of the Central Dogma of Molecular Biology. DNA is transcribed into RNA, which is finally translated into a protein that folds into a specific conformation. Made using ChemBio Draw.

Proteins can play a variety of functions, which are usually controlled by the genes of an organism's genome. According to the central dogma of molecular biology, proteins all begin as the hereditary template of DNA before being processed into polypeptide chains (see Figure 1) (Albert et al. 2014). DNA is transcribed into RNA, which is then translated into different amino acids that are connected via peptide bonds to form long chain proteins. The building blocks for protein chains are the twenty different amino acids, all with their own unique chemical properties, such as acidity or basicity. This linear chain of amino acids is the first level of protein structure, known as the primary structure. As this chain is produced, the chemical properties of each amino acid cause conformational and shape changes (Albert et al. 2014). Hydrogen bonds between atoms in the polypeptide backbone stabilize regions into either an alpha helix or a beta-pleated sheet, describing its secondary structure.

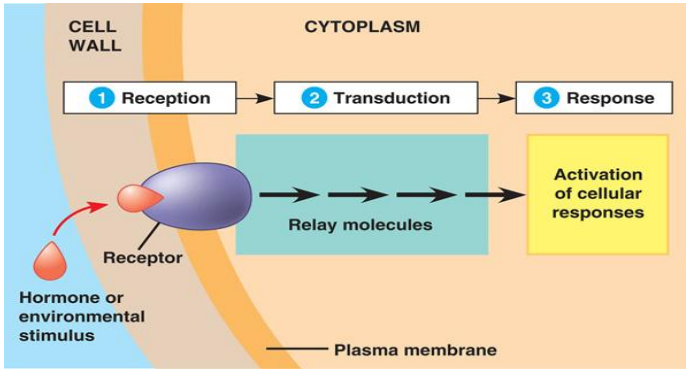


Figure 2- The generic signal transduction pathway for a stimulated specific biochemical mechanism such as metabolism or gene expression. The first step in the signal-transduction cascade is an extracellular ligand binding to the receptor; this allows cells to respond to the ligand without any crossing of the plasma membrane (Tsuji et al. 2013). Then, secondary messengers transfer information from the ligand-receptor complex. Many of these secondary messengers relay the signal through the use of protein kinases, which phosphorylate certain residues of proteins. Once the signal is received and the biochemical pathway is stimulated or inhibited, regulation occurs to terminate this signal-transduction event until another stimuli is present (Miami 2014).

In addition to backbone interactions, the unique R groups on the individual amino acids interact and stabilize a three-dimensional shape known as the tertiary structure (Albert et al. 2014). These chemical interactions include hydrogen bonding, hydrophobic interactions, van der Waals interactions, disulfide bridges, and ionic bonds. Finally, these three-dimensional proteins can associate multiple polypeptide chains, defining a protein's quaternary structure (Albert et al. 2014). Each level of structure helps determine whether the protein functions as an enzyme, receptor, or another functional unit key to biological processes. Some of the most important proteins for the survival of multicellular organisms are receptors, which are located in the plasma membrane and facilitate intercellular communication through the signal transduction pathway shown in Figure 2. These specialized proteins allow biological systems to respond to stimuli such as taste and smell (Civelli et al. 2013). The largest class of receptors contains G protein-coupled receptors, which allow long-range cellular signaling.

GPCRs: The Taste Buds of the Cell

The G protein-coupled receptor superfamily of proteins is one of the largest and most diverse classifications of proteins as it encodes over eight hundred genes (Vankatakrishnan et al. 2013). GPCRs are membrane proteins that sit in the fluid phospholipid bilayer of the plasma membrane of almost every cell in a variety of organisms. This plasma membrane allows cells to maintain a specialized internal environment to facilitate specific reactions and intracellular growth (Kroeze et al. 2003). GPCRs allow cells to communicate with the external environment via signal transduction, which allows a cell to remain at homeostasis and coordinate cellular activities across the entire organism.

Each GPCR has a unique three-dimensional structure. However, all receptors are structurally characterized by seven transmembrane segments, seven alpha helices, and usually have associated G proteins. The whole receptor protein has three intracellular loops that sit in the cytoplasm of a cell and three extracellular loops that lie outside the cell. These extracellular loops are the surface on which the signal transduction reactions occur (Figure 3).

In order to carry out biological tasks, such as cellular signaling, the protein changes conformation to stimulate a response within the

cell. The process of signaling involves an extracellular event followed by an intracellular response. The process begins with ligand binding, in which the GPCR binds to the specific stimuli. GPCRs are important because they can respond to a variety of stimuli such as ions, complex molecules, light, or other proteins. This ligand-binding event then causes the protein to undergo a conformational change, which usually signals certain G proteins (Nygaard et al. 2009). Overall, the function of GPCRs is highly dependent on changes in protein structure, which begins a cascade of reactions (Figure 3).

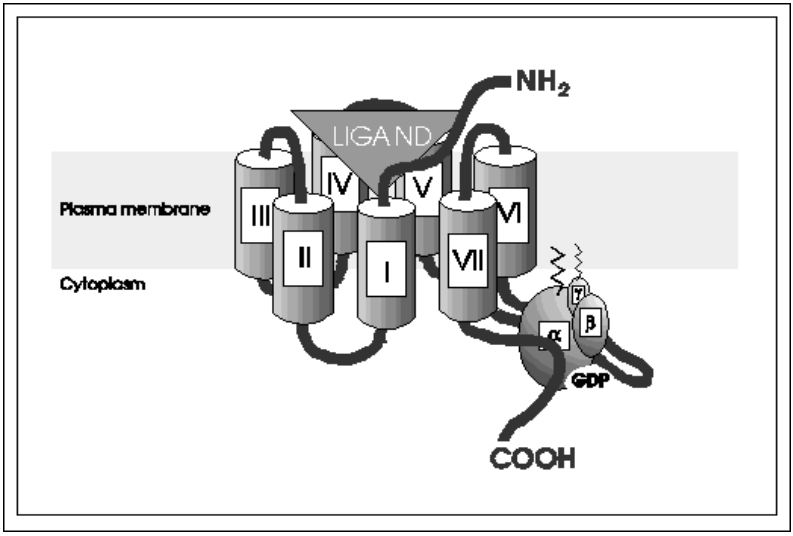


Figure 3- The generic GPCR, with all of its components sitting in the plasma membrane of a cell. Signals go from N-terminus to C-terminus. Ligand binding may involve residues within extracellular loops (between helices II-III, helices IV-V, helices VI-VII) and external regions of helices III, V, VI, and VII. This activates the cytosol's signaling networks, which ultimately ends in a cellular response (Nygaard et al. 2009). This allosteric mechanism, regulation through binding, is repeated in a variety of organ systems and is responsible for processes such as sight, metabolic activity, and regulation of cellular proliferation (Zhang et al. 2012).

Mutation or malfunction in these processes leads to disease because the receptor has an improper response to its environment;

therefore, a cell cannot maintain homeostasis. For example, nucleotide base mutation in the rhodopsin gene can cause misfolding, which will prevent synthesis and lead to vision loss because the receptor will interact differently with photons: a condition known as retinitis pigmentosa (Spiegel and Weinstein 2003). The nucleotide change causes amino acid alteration, which can prevent protein synthesis or alter intramolecular interactions, in both cases having drastic effects on structure. In addition, misregulation of GPCRs is found in cases of cancer, Alzheimer's disease, and cardiovascular disease. Even HIV is found to interact with a GPCR, making the receptor a viable drug target (Spiegel and Weinstein 2003).

Because GPCRs are involved in many severe diseases, thirty-six percent of all drugs target eighty-two G protein-coupled receptors (Civelli et al. 2013). It is difficult to create molecules that can permeate the highly specific phospholipid bilayer; Receptors, such as GPCRs, simplify the process of drug production. The use of receptors allows pharmaceutical companies to make drugs that can control biochemical pathways such as the cyclic adenosine monophosphate (cAMP) pathway or the phosphatidylinositol pathway. Pathway control affects regulation of metabolism and enzyme catalysis in the human body. Understanding GPCRs allows for manipulation of biological systems, which is why research is continually being done to further understand GPCRs and methods to stimulate changes in protein conformation (Vankatakrishnan et al. 2013).

Orphan Receptors: Drug Targets of the Future

A key way that research has characterized GPCRs is through analyzing the transmitter-receptor interactions and grouping receptors with similar transmitters/ligands. Recently, researchers have studied GPCRs whose ligands are unknown: orphan receptors (Tang et al. 2012). There are five GPCR families (*Glutamate, Rhodopsin, Adhesion, Frizzled/Taste2*, and *Secretin*), and orphan receptors exist in each family. The pharmacology industry concerns itself with these unknown receptors because they open up an entirely new field of research for novel drug targets. The industry attempts to deorphanize receptors by finding their transmitters (Civelli et al. 2013).

We are interested in studying the orphan receptor GPR174, of which little is known, except that its activation may have a possible role in combating leukemia. In order to characterize its structure, we used a

bioinformatics approaches to compare GPR174 to known structures. After gaining insight into the structure, we aimed to predict its molecular function. In order to complete this study we compared our orphan receptor of interest to the rhodopsin GPCR and the beta-2 adrenergic receptor, both of which are widely found in cells and whose structures have been characterized using x-ray crystallography. This comparison will allow us to further understand our receptor of interest.

Rhodopsin

Rhodopsin is a photoreceptor protein that is highly expressed in the eyes, and is most heavily concentrated in the rod cells of the retina. This protein is both a G protein-coupled receptor and a retinal-binding protein. This protein is unique in that its ligand is a photon (Okada and Palczewski 2001). This GPCR is extremely sensitive because even dim light of the correct frequency can cause conformational changes. Rhodopsin usually absorbs the wavelength in the green-blue region, but small genetic changes would alter the optimum wavelength to which the receptor readily responds. In general, light stimulates the GPCR. Stimulated G-proteins induce activation of guanosine monophosphate to begin a biochemical cascade, with the eventual effect of visual stimulation (Deupi 2014). This receptor is widely found and has been characterized by x-ray diffraction, making it a perfect comparison for our analysis. Many GPCRs are rhodopsin-like, such as GPR174; therefore, they are grouped in class A (Civelli et al. 2013).

Beta-2 Adrenergic receptor

The beta-2 adrenergic receptor is located in the cell membrane of almost every cell in the human body. Its ligand is the neurotransmitter adrenaline, which stimulates a variety of physical responses. Adrenaline responses include regulation of the muscular system, stimulation of circulatory system output, and support for metabolism in the digestive system (Rasmussen et al. 2011). The beta-2 adrenergic receptor was one of the first GPCR's to be crystallized in a lipid environment using a technique similar to lipidic cubic phase. It is similar to GPR174 in that it is difficult to crystallize using normal x-ray crystallography techniques, and it responds to molecular ligands rather than photons.

GPR174: What we know

Investigators conducted research to identify the gene that encodes the orphan receptor, GPR174. The gene was overexpressed in a Chinese hamster ovary cell line, resulting in a higher concentration of the GPR174 receptor protein. Consequently, the reactivity of the cell changed, and comparison to a control cell allowed for deduction of protein function (Sugita et al. 2013). This led to the conclusion that GPR174 plays a role in cell-to-cell adhesion. In addition, GPR174 is found widely in blood cells and mutations in this gene lead to leukemia, making it an important drug target (Sugita et al. 2013).

After studying the function of the GPCR, investigators attempted to predict the ligand that would have a high binding affinity for GPR174. In order to compare various ligands and their reactivity with the GPCR, investigators measured the production of cAMP. After testing nucleotides, lipids, and other small molecules, the most likely ligand was found to be lysophosphatidylserine (Sugita et al. 2013). We analyzed these experimental studies through computational methods, which allowed us to correlate structure and function for GPR174.

Methods

In order to deduce the structure of the orphan receptor GPR174, we utilized computational methods on our amino acid sequence to predict secondary structure. The purpose of this computation was to understand where the helix ended and where it twisted to correlate structure and function. We began with the primary structure of the orphan receptor from GenBank records and used a computational method, Chou & Fasman Secondary Structure Prediction Server (CFSSP), to predict the secondary structure. The CFSSP is an online amino acid sequence analyzer. The program examined known protein structures, and quantitated the chance that a given amino acid would be found in a specific structure of GPR174. These algorithms helped us deduce where alpha helices, beta sheets, and turns would exist in a protein sequence (Nishikawa 1983).

This type of bioinformatics study is extremely important, because it often becomes difficult to apply physical models to certain proteins due to their dynamic structure and specific environment interactions. The CFSSP method has shown to be about sixty percent

accurate when predicting secondary structure (Nishikawa 1983). Unfortunately, the analysis is limited by the fact that proteins undergo conformational changes when interacting with their environment. Despite these limitations, the method gives insight into structure for analysis of function when physical methods are inconclusive.

After analyzing GPR174 using the CFSSP computational method, we analyzed two proteins of known structure. After analyzing these predictions, we gained further understanding about the accuracy of the CFSSP method. The computations aided in our deduction of the mechanism with which the studied ligand, lysophosphatidylserine, would interact with the predicted protein model.

Results

After conducting the computational analysis of our protein's amino acid sequence, we were able to graphically show the probabilities of helices, sheets, and turns existing in the secondary structure of the protein (Figure 4). Overall, the results demonstrated two key pieces of information. Firstly, CFSSP accurately predicted where helices would be found in known GPCR structures with few discrepancies. Although both the helix's location and twisting were not clear through computational methods, this comparison lent some support to our results. Secondly, the computational method did predict seven helices, which allows us to deduce further information about the protein function. In addition to helping us understand our known GPCR, the results allowed us to create a limited protein structure prediction of GPR174. This computational structure allowed us to predict which residues could sit inside, outside, or even within the lipid bilayer. This gave us key information about the how the GPCR could react with compounds.

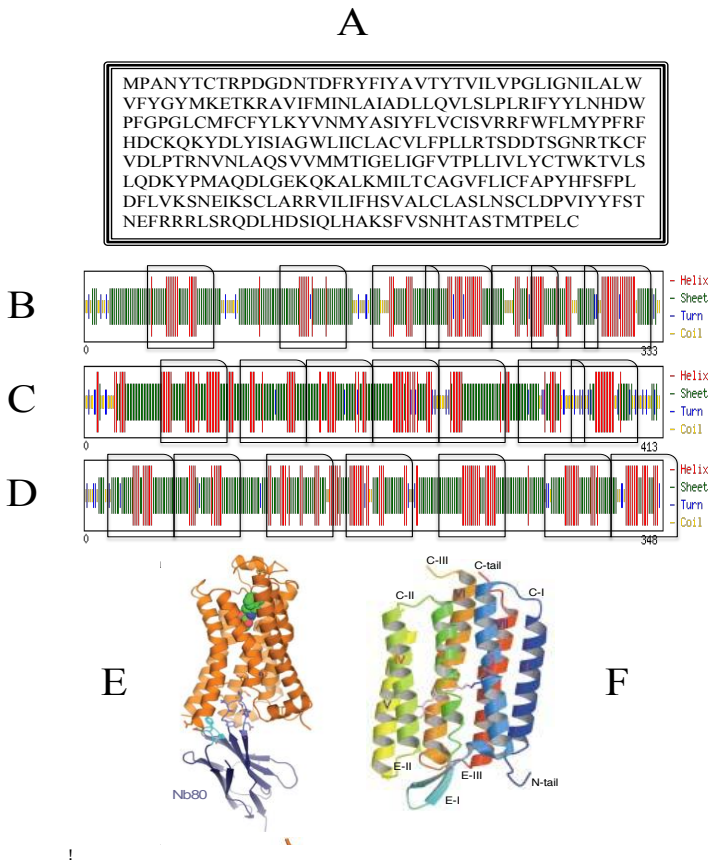


Figure 4- (A) The amino acid sequence of our GPCR of interest, GPR174. (B) CFSSP analysis of our GPCR of interest. Predicted seven helices are circled. (C) CFSSP analysis of known beta-2 adrenergic receptor. Predicted seven helices are circled. (D) CFSSP analysis of known rhodopsin receptor. Predicted seven helices are circled. (E) Crystal Structure of beta-2 adrenergic receptors. It is important to note that helices are in different locations than the calculations predicted. (F) Crystal Structure of rhodopsin receptors. It is important to note that helices are in different locations than calculations predicted. (Sugita et al. 2013) (Okada and Palczewski 2001) (Rasmussen et al. 2011)

Discussion

Although our data displays little to no correlation of any of the functions of the three GPCRs, we still gained two key pieces of information about our GPCR through the analysis. Firstly, we were able to model our protein through predictions of how residues would most likely sit in the plasma membrane (Figure 5). From this point, we are able to analyze with which residues the supposed ligand would interact. This allowed us to support the hypothesis that lysophosphatidylserine is the transmitter of GPR174, because we assume it interacts with the charged residues (Figure 6). This result gave us better support for the ongoing research attempting to deorphanize GPR174.

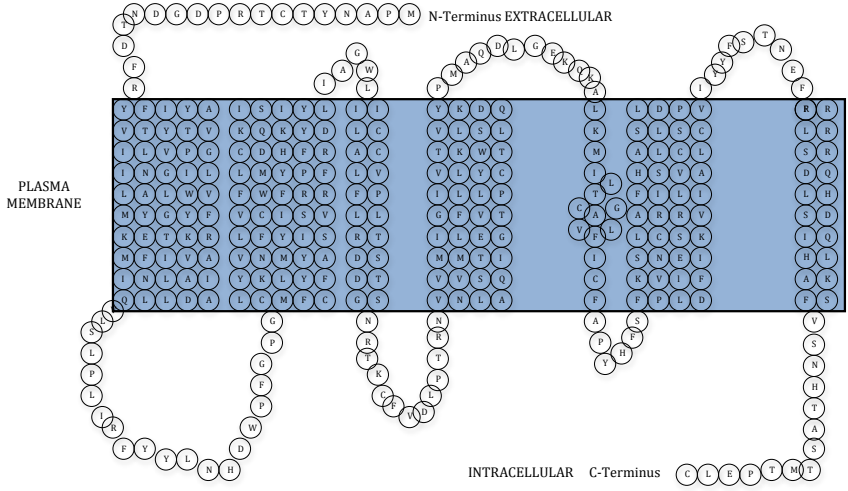


Figure 5- Predicted protein structure from our CFSSP computational analysis, which show where residues sit in the membrane. When trying to understand how ligands would bind to GPR174 we were especially interested in the extracellular portions of the protein. These portions have charged residues such as Aspartic acid (D), Glutamic Acid (E), and Lysine (L), which were predicted to interact with the lysophospholipid. The figure was constructed based on data in Figure 4.

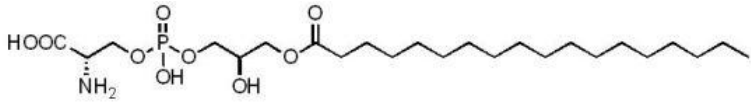


Figure 6- Lysophosphatidylserine, shown above, is the current predicted ligand that interacts with GPCR GPR174. We expect the ligand to interact with the charged regions in the structure made in Figure 5. Molecule made using ChemBio draw.

Although we supported other investigators' hypotheses, our second result allowed an understanding of the limitations in our methods. We compared our resultant calculations of rhodopsin and the beta-2 adrenergic receptor to the known x-crystallography structures. Our computational methods were limited in detailing where the helices ended and how they twisted. This made predictions of ligands through computational methods difficult, since small changes in structure could possibly signify that completely different residues participate in the bonding interaction. Therefore, even after computational analysis, this calls for more thorough experimental design in order to fully deorphanize the GPCR GPR174.

Future Directions

Due to the limitations of these computational methods of analysis for protein structure, we can draw limited conclusions. In order to further characterize the structure and specific ligand for GPR174, there are other methods that should be explored. A natural first step would be to crystallize the structure with a process similar to x-ray diffraction, despite the limitations of this procedure. Once GPCRs are in solution, outside of the cellular membrane, the protein is extremely fragile and cannot be treated with dye or detergent, making x-ray crystallography almost impossible to implement. In order to combat these limitations, researchers have adapted a new technique called lipidic cubic phase that allows for easier and more accurate crystallization (Service 2014). This method utilizes a solution of lipids and other compounds to give an environment that stabilizes the protein. When the protein enters the solution of both polar water and non-polar lipids, the portions of the protein interact to produce correlating intermolecular forces. This type of reaction stabilizes the protein and gives investigators a hollow framework to crystallize. This creates a novel method to reveal the structure of GPR174, allowing further study of its possible ligand to deorphanize it.

In addition to using crystallography, the field of drug discovery has adapted the technique of reverse pharmacology to identify possible ligands. Reverse pharmacology begins with a hypothesis of receptor function (Civelli et al. 2013). Our GPCR of interest, GPR174, has been found to stimulate cAMP pathways. Therefore, in order to see if a ligand has a high binding affinity for the GPCR, we could measure the concentration of cyclic adenosine monophosphate, which is a secondary messenger (Sugita et al. 2013). Pathway stimulation causes an increase in the concentration of cAMP, which activates cyclic nucleotide-gated ion channels and enzyme protein kinase A (PKA). PKA promotes muscle contraction, acts as a transcription factor that regulates gene expression, and converts glycogen into glucose. With this in mind, we can apply reverse pharmacology to GPR174 through testing a series of ligands and measuring concentrations of cAMP, glucose, or even glycogen. From this point, we could screen a variety of compounds to see if the cell with the overexpressed protein produces the response of interest. Often, the compounds used are those that are popular in the drug industry and those that have stimulated homologous receptors. We could also use compounds with functional groups found on lysophosphatidylserine such as the phosphodiester, carboxylic acid, and ester. The hits from this type of screening give the drug industry a starting point for what types of compounds have a high or low binding affinity with specific receptors.

Another method of deorphanizing the GPR174 receptor could be using specific mutations to understand the function that specific amino acids play through mutagenesis. This technique is possible because ligand-receptor interactions at the most basic level involve the small molecules interacting with atoms that have very specific properties. The assumption is that replacements of these receptor residues would cause one of two scenarios: either a loss in functionality of the receptor, or a change in the function of the receptor (Kristiansen 2004). If this technique were implemented on GPR174, many of the charged residues that are thought to interact with our predicted ligand would be replaced with uncharged amino acids. This means researchers should replace a charged basic lysine with an uncharged hydrophobic valine. This type of technique gives two key insights into GPR174 function. First, it gives us a better picture of which residues sit outside of the cell and interact with the ligands compared to those sitting in the plasma membrane. Second, it allows us to deduce the mechanism of how the ligand specifically interacts with the receptor and how this interaction leads to the corresponding biological activity.

Mutagenesis is a technique that takes advantage of the high specificity required for a functioning biological system to see its mechanism of action. Altogether, these experimental techniques can provide information for comparison with our theoretical model.

Conclusion

Overall, what we must realize is that the link between protein structure and function is not formalized, but is extremely important to our understanding of biological systems—especially in the case of GPCRs. Small conformational changes in receptors begin the sequence of falling molecular dominoes that stimulate almost every biochemical pathway, which end up commanding human physiology. In order to study the wide varieties of proteins, a collaboration of computational and experimental methods must be implemented to identify ligand-receptor pairs. This will be the pharmaceutical industry's future, because these ligands will be the drugs of the future. We must look at proteins like Louis Sullivan looks at architecture, so we can build a better understanding of how these structured molecular machines function.

Works Cited

Albert B, Bray D, Hopkin K, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2014. “Chapter 4: Protein Structure and Function.” *Essential Cell Biology*. 4th ed. New York: Garland Science. 121-170.

Civelli O, Reinscheid RK, Zhang Y, Wang Z, Fredriksson, Schioth HB. 2013. “G protein- coupled receptor deorphanizations.” *Annual Review of Pharmacology and Toxicology* 53:127-146.

Deupi X. 2014. “Relevance of rhodopsin studies for GPCR activation.” *Biochimica and Biophysica Acta* 1837(5):674-682.

Goodsell DS. 2009. “Chapter 2, Molecular Machines.” *The Machinery of Life*. 2nd ed. New York: Copernicus Books. 9-26.

Kristiansen K. 2004. “Molecular mechanisms of ligand binding, signaling, and regulation within the superfamily of G-protein-coupled receptors: molecular modeling and mutagenesis approaches to receptor structure and function.” *Pharmaceutical Therapy* 103:21-80.

Kroeze WK, Sheffler DJ, Roth BL 2003. “G-protein-coupled receptors at a glance.” *Journal of Cell Science* 116:4867-4869.

Miami. 2014. “Plants and the environment: tropisms, circadian rhythms, and more.” <http://www.bio.miami.edu/dana/226/226F08_21.html>.

Nishikawa K. 1983. “Assessment of secondary-structure prediction of proteins comparison of computerized chou-fasman method with others.” *Biochemistry and Biophysics Acta* 748(2):285-299.

Nygaard R, Frimurer TM, Holst B, Rosenkilde MM, Schwartz TW. 2009. “Ligand binding and micro-switches in 7TM receptor structures.” *Trends in Pharmacological Science* 30(5):249-259.

Okada T and Palczewski K. 2001. “Crystal structure of rhodopsin: implications for vision and beyond.” *Current Opinion in Structural Biology* 11:420-426.

Rasmussen SGF, Choi H, Fung JJ, Pardon E, Casarosa P, Chae PS, DeVree BT, Rosenbaum DM, Thian FS, Kobilka TS, Schnapp A, Konetzki I, Sunahara RK, Gellman SH, Pautsch A, Steyaert J, Weis WI, Kobilka BK. 2011. “Structure of nanobody-stabilized active state of the beta-2 adrenoceptor.” *Nature* 469:175-181.

Service RF. 2014. “Gently Does It.” *Science* 343:1094-1097.

Sleator RD. 2012. “Proteins Form and Function.” *Bioengineered Bugs* 3(2):80-85.

Spiegel AM, Weinstein LS. 2004. “Inherited Diseases Involving G Proteins and G Protein- coupled receptors.” *Annual Review of Medicine* 55:27-39.

Sugita K, Yamamura C, Tabata K, Fujita N. 2013. “Expression of orphan G-protein coupled receptor GPR174 in CHO cells induced morphological changes and proliferation delay via increasing intracellular cAMP.” *Biochemistry and Biophysics Research Communication* 430:190-195.

Sullivan LH. 1896. “The tall office building artistically considered.” <http://www2.gwu.edu/~art/Temporary_SL/177/pdfs/Sullivan_Tall.pdf>.

Tang X, Wang Y, Li D, Luo J, Liu M. 2012. “Orphan G protein-coupled receptors (GPCRs): biological functions and potential drug targets.” *Acta Pharmacologica Sinica* 33:363-371.

Tsuji M, Ueda S, Hirayama T, Okuda K, Sakaguchi Y, Isono A, Nagasawa H. 2013. “FRET-based imaging of transbilayer movement of pepducin in living cells by novel intracellular bioreductively activatable fluorescent probes.” *Organic Biomolecular Chemistry* 11:3030-3037.

Vankatakrishnan AJ, Deupi X, Lebon G, Tate CG, Schertler GF, Babu MM. 2013. “Molecular signatures of G-protein-coupled receptors.” *Nature* 494:184-194.

Zhang Z, Wu J, Yu J, Xiao J. 2012. “A brief review on the evolution of GPCR: Conservation and diversification.” *Journal of Genetics* 2:11-17.

On the *A priori*: Conventionalism and Rationalism

Alex Slotkin (CLA 2017)

Our *a priori* knowledge, if it is not erroneous, is not merely knowledge about the constitution of our minds, but it is applicable to whatever the world may contain, both what is mental and what is not mental.
—Bertrand Russell, *The Problems of Philosophy*

§1. Introduction

A priori judgments are generally defined as judgments that are known to be true apart from or independently of sensory experience. These judgments are different from *a posteriori*, or empirical judgments, which are known to be true on the basis of sensory experience. Take a look at this example of an *a priori* judgment:

A pentagon has five sides.

Pentagons *necessarily* have five sides, and we can know this to be true independent of experience. *A posteriori* judgments, such as "my favorite season is winter," on the other hand, are only known to be true from experience. These judgments, moreover, are unlike *a priori* judgments in that they are contingently true. While my favorite season at this moment in time is winter, it may very well be fall next year. *A priori* judgments, however, are necessarily true; a pentagon *always* has five sides. For either type of judgment to be true or false, the word "judgment" must refer to the content of a mental act or thought, as it is used throughout this essay, rather than the mental act itself. While "giraffes are short compared to humans" may be an erroneous thought, the actual act of thinking has no truth-value.

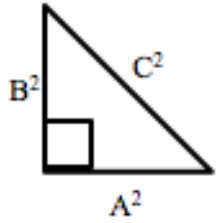
A posteriori judgments such as "giraffes are *not* short compared to humans" are not controversial because their truth can be ascertained by appealing to sensory experience, whereas *a priori* judgments are controversial because philosophers have differed on how such judgments are known to be true apart from experience. How do we know that "a pentagon has five sides" is true independent of experience? Or, similarly, how can we know that the proposition

"something cannot be 'A' and 'Not A' at the same time and in the same respect" is true without having to appeal to our senses? The discussion on the nature of *a priori* judgments, then, is framed by the problem of explaining what it means to say that these judgments are knowable independent of experience.

Each of the nine other sections in this essay serve to explain the nature of the *a priori* from the viewpoints of nine different philosophers, this paper's author included. The first six sections present David Hume's, Immanuel Kant's, A.J. Ayer's, W.V. Quine's, Laurence BonJour's, and Michael Devitt's philosophical positions on the issue, respectively. In section seven, the conventionalist account of *a priori* judgments is explained. In section eight, a rationalist critique of conventionalism is covered. Finally, after having examined two opposing positions on *a priori* knowledge, conventionalism and rationalism, I will defend my thesis in which I explain why conventionalism is inferior to rationalism.

§2. Hume's Classical Empiricist View of the *A priori*

David Hume (1711-1776) proposed that there are two kinds of judgments: relations of ideas and matters of fact. Relations of ideas are the *a priori* claims—claims deduced from reasoning, not experience—that we can make (Hume 298). Mathematical claims, such as the Pythagorean theorem, "$A^2 + B^2 = C^2$," are classic examples of relations of ideas because they are demonstratively certain. Take a look at the triangle below:



If we assign values to the variables (setting A=3, B=4, and C=5) and solve the equation, the theorem's truth-value is asserted:

$$A^2 + B^2 = C^2$$

$$9 + 16 = 25$$

$$25 = 25$$

"$A^2 + B^2 \neq C^2$" is contradictory because the sum of A^2 and B^2 is *always* and *necessarily* C^2 in all right triangles. Not all of Hume's relations of ideas, however, are demonstratively certain. There are *a priori* judgments, such as "something cannot be 'A' and 'Not A' at the same time and in the same respect," which are intuitively true.

Matters of fact, on the other hand, are contingent, or *a posteriori*. The judgment "it will be cloudy tomorrow" is an example of a matter of fact. Such claims are not demonstratively or intuitively certain because their opposites are always possible (Hume 298). It is possible, after all, that it will not be cloudy tomorrow. Therefore, there are only two types of judgments according to Hume: relations of ideas, which are demonstratively, and therefore necessarily, true (or, in other words, *a priori*), and matters of fact, which are merely contingently true (or, in other words, *a posteriori*).

§3. Kant's Transcendental Idealist View of the *A priori*

Before Immanuel Kant (1724-1804), there were only two types of judgments: *a priori* and *a posteriori*. Kant defined "*a priori*" as having two characteristics: necessity and universality. We know *a priori* judgments are *necessarily* true because "they cannot be otherwise than they are," and we know they are *universally* true because they do not allow for exceptions (Kant 143). *A posteriori* judgments, on the other hand, are *contingently* true; they can be otherwise and exceptions are allowed as possible.

For Kant, all judgments are either *a priori* or *a posteriori* and either analytic or synthetic. All analytic judgments are *a priori*. A popular example of an analytic judgment is "all bodies have mass." We know this sentence to be true apart from experience because the

concept of mass is contained in the concept of a body. But whereas analytic judgments are sentences where the predicate is contained in the subject *a priori*, the predicate is not contained in the subject of synthetic judgments (Kant 146). An epistemological, metaphysical, and semantic distinction is drawn here between *a priori* and *a posteriori*, necessary and contingent, and analytic and synthetic judgments, respectively, most of which can be brought together in different combinations to create new judgments.

But until Kant wrote his groundbreaking *Critique of Pure Reason*, all synthetic judgments were considered to be *a posteriori*, or empirical judgments. The judgment "some bodies have weight," for example, is synthetic because we know *a posteriori* that only some bodies have weight. However, not all synthetic judgments are known *a posteriori*. According to Kant, besides analytic *a priori* judgments and synthetic *a posteriori* judgments, there is a third type of judgment: synthetic *a priori* judgments, claims that are necessarily and universally true without having their predicate be contained in the subject. Kant argued that judgments like "2 + 3 = 5" and "every event has a cause" are synthetic *a priori* judgments (147). In these judgments, the predicates are not contained in the subject concepts (hence the reason why these judgments are synthetic), but the predicates belong to the subject concepts necessarily (hence the reason why it is *a priori*), not contingently.

§4. Ayer's Moderate Empiricist View of the *A priori*

A.J. Ayer (1910-1989) and other moderate empiricists hold that all *a priori* judgments are analytic. In other words, they deny that there is such a thing as "synthetic *a priori* judgments." For Ayer, analytic judgments are known to be true *a priori* by virtue of the meanings of the words used. We all understand, for example, that the judgment "all bachelors are unmarried men" is true because unmarried men is a synonym for bachelors. Ayer argues that *a priori* claims are true because of the conventions of language; they are true by virtue of the meanings of their components.

Ayer pushes the conventions of language further to determine which judgments are verifiable. Judgments, he writes, are either directly verifiable or are verifiable in principle (Ayer 168). "Drew

University is in New Jersey" is a directly verifiable claim because someone can travel to New Jersey to confirm its judged location. Claims verifiable in principle, however, cannot be directly verified. The judgment that the Earth's core is hot is one such claim because, although we can imagine verifying it by digging to the center of the Earth in some futuristic machine, we cannot as of yet verify it through direct experience.

§5. Quine's Radical Empiricist View of the *A priori*

W.V. Quine (1908-2000) challenges Ayer's moderate empiricism. Quine argues that the truth-value of an *a priori* claim like "all bachelors are unmarried men" cannot be established by the judgment's semantic division—its analytic or synthetic nature—alone because no two words are completely synonymous. When we substitute "bachelor" for "unmarried man" in the phrase "bachelor of arts," for example, the sentence no longer makes sense, demonstrating that the word "bachelor" is not always synonymous with "unmarried man" (Quine 181). According to Quine, the *a priority* of what philosophers have called "analytic judgments" cannot be justified by an appeal to semantics.

After Quine refutes moderate empiricism, he begins constructing an argument against the existence of *a priori* knowledge by first introducing the coherence theory of truth. The coherence theory of truth holds that a belief is justified only if it coheres with any of the beliefs that form what he calls a "web of beliefs." A member of the Republican Party, for instance, holds certain beliefs, like the belief that government intervention is usually bad, which define him/her as a Republican. We choose to adopt new beliefs if they cohere with the entirety of our own web (Quine 192). A Democrat, therefore, might choose not to believe in trickle-down economics because it does not cohere with his/her web of beliefs.

When we are faced with what Quine calls "recalcitrant experiences," that is, those experiences that seem ineradicable but that appear to conflict with our web of beliefs, we compare them to our most expendable beliefs *before* comparing them to our core beliefs, such as the belief that the sum of one and one is two. A belief is justified or acceptable if it fits or can be woven into our web of beliefs. However,

there are instances when experiences are so stubborn or recalcitrant that they call for us to throw away some of our core beliefs. Charles Darwin's *On the Origin of Species*, for example, forced many theists who believed in creationism to significantly change their web of beliefs. Because every judgment or belief is revisable in the face of such recalcitrant experiences, there are no *a priori* judgments. Or, in other words, all judgments are synthetic and *a posteriori*, to use Kant's language.

§6. BonJour's Response to Quine

Laurence BonJour (1943-present) tries to refute Quine's claim that there are no *a priori* judgments by demonstrating that there are reasons that can be offered to justify *a priori* claims. We understand *why* the *a priori* statement "no surface can be uniformly red and uniformly blue at the same time," for instance, is true without having to appeal to sensory experience (BonJour 180). While Quine assumes that all beliefs or judgments are revisable, BonJour argues that all *a priori* judgments are known or justified through what he calls "*a priori* reasons."

He explains what he means by "*a priori* reasons" by demonstrating that most forms of reasoning are not empirically verifiable. Take the logical rule of *Modus Ponens* for example:

(1) If P, then Q.		(1) If Jon lives in NYC, he lives in the U.S.
(2) P	-or-	(2) Jon lives in NYC.
---		---
(3) Therefore, Q		(3) Therefore, Jon lives in the U.S.

We understand *why* the conclusion ("3") must follow from the premises ("1" and "2"), but the reason for this is not only known apart from experience but also cannot be proven empirically. Similarly, there are empirical judgments that cannot be confirmed directly by experience, such as "the Earth's core is hot." BonJour shows that even though

Quine wanted to disprove the existence of *a priori* knowledge through his discussion of the web of beliefs, it turns out that on closer examination the plausibility of his coherence theory of truth, which *his* web of beliefs holds as true, actually depends on the existence of *a priori* reasons.

Without *a priori* reasons, BonJour contends, the rules that govern Quine's web of beliefs cannot be trusted because the claim to their legitimacy and reliability can only be established *a priori*, not through experience. BonJour shows that the very rules Quine uses as the criteria for deciding whether or not to admit any given belief into a web of beliefs cannot be justified by experience. This means that if Quine refuses to believe in the existence of *a priori* reasons, his position is in danger of devolving into hopeless skepticism, which he certainly does not support. Quine's own position, far from proving that no judgment is unrevisable, depends on the existence of *a priori* reasons for its plausibility.

§7. Devitt's Response to BonJour

Michael Devitt (1938-present), who supports Quine's radical empiricism, according to which there are no *a priori* judgments, attacks BonJour's rationalist critique of radical empiricism by arguing that BonJour's notion of "*a priori* reasons" is obscure. BonJour argues that when we consider an *a priori* judgment, such as "all authors are writers," we have some "direct insight into the necessary character of reality" (Devitt 193). But what does it mean to say that this glimpse into the character of reality is an *a priori* insight? As far as Devitt is concerned, BonJour has not presented anything that supports or justifies his "*a priori* insight," enveloping the *a priori* in a veil of mystery. Empirical judgments, however, do not suffer from obscurity.

Empirical judgments relate our beliefs to the happenings of the external world in the same way a thermometer reads the air temperature; the thermometer observes the world around it and makes a judgment based on its observations. Similarly, we observe the world around us and form a belief based on *our* observations, such as a belief in gravity when we watch objects fall. There is nothing deeply mysterious about how empirical judgments operate, whereas we do not understand how *a priori* insights function; they may, after all, be

justified in some "holistic empirical way" (Devitt 193). Therefore, according to Devitt, we have grounds for asserting that there is no *a priori* knowledge.

§8. Conventionalism

Conventionalism is the belief that semantics determines a judgment's truth-value and can thus account for *a priori* knowledge. The position has supposedly been dealt a hard blow by rationalists like BonJour who argue that no claim is true until reality makes it so. However, conventionalists refer to the judgment's analytic nature to determine its truth-value, arguing that statements like "a pentagon has five sides" is true because the predicate is contained in the subject *a priori*. Pentagons, in other words, only have five sides because the definition of the word "pentagon" necessitates five-sidedness. But suppose a community came together and decided that the word "pentagon" now refers to any figure with more than six sides. Would pentagons still have five sides? Is there anything that can prevent these people from changing the truth-value of the judgment, "a pentagon has five sides?" The answer to both questions for conventionalists is no.

Knowing that semantics create our understanding of the world, we begin to see how conventionalism can account for *a priori* knowledge. But rationalists like Quine are quick to object that because all knowledge is revisable, which was the case with the example of the pentagon, the *a priority* of these statements cannot be reasonably upheld. History seems to validate the idea that all knowledge is revisable. After all, at one point in time, whales were known to be fish *a priori* (Sullivan 387*)*. However, the epistemological and metaphysical truth-value of this claim—it's *a priority*, necessity, and universality—is left intact.

Although it is known today that whales are mammals, the definition of a whale as a fish validates the claim "whales are fish," since the word "whale" implies fish-hood by virtue of its meaning in the same way that our new definition of the word "pentagon" implies the quality of having more than six sides. For people who identified whales as fish, the statement is justified *a priori*. Revisability, therefore, is compatible with the notion of conventionalism; it suggests that truth by virtue of meaning is not incoherent but rather refines itself like scientific

beliefs over time. *A priori* judgments, then, should be thought of in relation to semantics.

§9. A Rationalist Argument Against Conventionalism

Rationalists reject conventionalism in favor of *a priori* reasons based on rational intuition, rejecting the idea that an appeal to the meanings of words alone can account for *a priori* justification (Garcia-Capintero and Otero 249). BonJour, for example, argues that sentences like "all bachelors are unmarried men" are not made true by the conventions of language. "Bachelors" and "unmarried men" may be synonymous, but the truth-value of the claim stems from its real empirical truth: "The view that identifies an analytic proposition with one that is 'true by virtue of meaning'… amount[s] to nothing more than the view that one who understands such a proposition can see directly or intuitively that it is true, where this is really just a misleading restatement of the rationalist view" (Bonjour 183).

One rationalist argument against conventionalism is that the conventional link between a sentence and the meaning of its content is shared by *all* judgments (Garcia-Capintero and Otero 249). Even claims known as *a posteriori* have this quality, such as "some water is H_2O." We know the chemical composition of water through observation, but some water implies that there is H_2O in the same way that "whales" implied fish-hood (Garcia-Capintero and Otero 249). If truth by virtue of meaning applies equally to *a priori* and *a posteriori* judgments, then conventionalism cannot accurately account for *a priori* claims because both *a priori* and *a posteriori* judgments receive their truth-value from the same place: semantics. And if this is the case, there is really no longer a distinction between *a priori* and *a posteriori* claims. Appealing to a word's meaning alone cannot justify *a priori* judgments.

§10. Thesis Defended

In his famous treatise on logic and philosophy, Ludwig Wittgenstein wrote, "The limits of my language mean the limits of my world" (Wittgenstein 76). Put simply, our proficiency in language affects how much of the world we can understand. Similar to how a

person born blind can never *really* grasp what the word "red" means, a person with a low proficiency in language fails to understand most of the world, although he/she may not realize it. The idea that semantics can accurately account for the happenings of the world fuels conventionalism and its divide with rationalism.

What I consider to be the best rationalist argument against conventionalism hereto is the claim that conventionalism cannot account for *a priori* knowledge because its truth-value originates from reality, not language itself. Whereas G-d may use His words to create reality ("God said, Let there be light; he willed it, and at once there was light"), human language cannot create the world (The Holy Bible, International Version, Gen. 1:3-5). Rather, semantics only *reflect* reality. Consider the analytic proposition "all triangles have three sides." Do triangles have three sides because the definition of a triangle necessitates three-sidedness, or is there some object with three sides that happened to be named a triangle, which, regardless of its name, will always keep its shape? The former decision supports conventionalism while the latter works in favor of rationalism.

Considering that in a world without people the shape of a triangle would still exist, and that much of the world existed *before* Homo sapiens, it is more than likely that there was an object with three sides that was a given a name which became the word "triangle." Therefore, language only reflects reality and the truth-value of *a priori* judgments originates from reality. Even if a community decided that triangles should refer to objects with more than three sides, their language would only reflect reality. The same could be said of synthetic *a priori* judgments as well as *a posteriori* judgments. To borrow from one of Kant's examples of a synthetic *a priori* judgment, the claim that "every event has a cause," for instance, is based on the *a priori* conditions that makes experience possible and not on the basis of the meaning of the words used.

The downfall of conventionalism is in focusing on words and not reality, which is why it cannot account for *a priori* knowledge. Can rationalism account for the *a priori*? I believe so. It certainly accounts for *a priori* knowledge through *a priori* reasoning. The judgment that "something cannot be 'A' and 'Not A' at the same time and in the same respect," for example, can only be known to be true *a priori*—no one can ascertain its truth through experience. And while semantics certainly help in explaining why it is true, the judgment's

epistemological and metaphysical components are just as important. Therefore, we have a *reason* to believe in *a priori* knowledge, even if we do not understand how we know them to be true independently of experience. *A priori* reasons are sufficient justification for rejecting conventionalism in favor of rationalism because, as it turns out, the rationalist position on the *a priori* is not terribly obscure.

Admittedly, rationalism does not explain *how* we know things to be true apart from sensory experience, but its account of the *a priori* is no more ambiguous than empirical knowledge. Devitt had argued that we have "'an intuitively clear and appealing general idea' of how empirical knowledge and justification are possible" (BonJour 2014, 197). In other words, experiences make empirical knowledge true and intuitively understood. Reality, however, rarely presents us with such instances of direct experiential justification. Scientists oftentimes justify claims about reality from abstractions, *not* direct experiences. When Isaac Newton observed objects fall down to Earth, he made an abstraction from reality, which became his theory of gravity. *A priori* knowledge, then, is no more obscure than empirical knowledge, and rationalism does not suffer from a veil of obscurity. Therefore, it is better to subscribe to the rationalist position of the *a priori* than to the conventionalist position.

Works Cited

Ayer, A.J. "The Elimination of Metaphysics." Epistemology: Contemporary Readings. London: Routledge, 2002. 166-175.

BonJour, Laurence. "In Defense of the A priori." Contemporary Debates in Epistemology. John Wiley & Sons, Inc., 2014. 177-184.

BonJour, Laurence. "Reply to Devitt." Contemporary Debates in Epistemology. John Wiley & Sons, Inc., 2014. 195-197.

Devitt, Michael. "There is No a priori." *Contemporary Debates in Epistemology*. John Wiley & Sons, Inc., 2014. 185-194.

García-Capintero, Manuel, and Otero, Manuel. "The Conventional and the Analytic." Philosophy *and Phenomenological Research* 78.2 (2009): 239-274.

Hume, David. "An Enquiry Concerning Human Understanding." *Epistemology:* Contemporary *Readings*. London: Routledge, 2002. 298-309.

Kant, Immanuel. "Critique of Pure Reason." *Epistemology: Contemporary Readings*. London: Routledge, 2002. 142-151.

Quine, W.V. "Two Dogmas of Empiricism." *Epistemology: Contemporary Readings*. London: Routledge, 2002. 176-193.

Russell, Bertrand. *The Problems of Philosophy*. London: Oxford University Press, 1959. 1-171.

Sullivan, Arthur. "Truth in Virtue of Meaning." *Canadian Journal of Philosophy* 38.3 (2008): 373-397.

The Holy Bible, *New International Version*. Grand Rapids: Zondervan House, 1984, Genesis 1:3.

Wittgenstein, *Ludwig. Tractatus Logico-Philosophicus*. London: Kegan Paul, Trench, Trubner & Co., LTD., 1922. 1-173.

MKULTRA in the Media:
The Public Face of the Top-Secret Program

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Riding the rebellious wave of social movements of the 1960's, when an anti-authoritarian and questioning ethos was growing in America, the field of investigative journalism experienced a rebirth. This social awakening presented an opportunity for the press to become an institution for social change and to renew its role as a watchdog of the government, an investigator and interpreter of news, and an educator of the public (Aucoin, *The Evolution of Investigative Journalism* 48). Exemplary of this rebirth were the 1969 exposure of the My Lai Massacre by Seymour Hersh and the 1974 Watergate scandal brought to light by Carl Bernstein and Bob Woodward, both of which contributed to a growing disillusionment with the American government. As James Aucoin explains, in this period "investigative journalism burst upon America's collective consciousness" (Aucoin, "Re-emergence of Investigative Journalism").

The chaotic and forthright social atmosphere of the 1960's and 1970's was a contrast to the socially conservative atmosphere of the 1950s. In his article, "The Re-Emergence of Investigative Journalism 1960-1975," Aucoin writes that the 1950's mainstream media reinforced "the image of a just and efficient political and economic system," and "downplayed or 'buried' news of business leaders and other elites who reaped unfair advantages or benefits." Moreover, it "paid little attention to class distinctions, religious disagreements or discontent, political dissidents, and deviations in traditionally respected institutions such as the courts, the community, and schools" (Aucoin, "Re-Emergence"). In this way, the media perpetuated the conservative atmosphere of the time. Aucoin makes a similar argument in his book *The Evolution of American Investigative Journalism,* in which he maintains that the mainstream media, satiated by America's abundance and wealth, focused on "progress-through-consumption," a reflection of the social atmosphere of the 1950's. The following decade, however, saw a dramatic move away from this practice. Shifting tides in the 1960's engendered "social and cultural developments that led the American public in general, and journalists in particular, to distrust

traditional institutions and government and demand more from the media" (Aucoin, "Re-Emergence").

In the 1960s, specific social and cultural events and developments "chipped away at the façade of consensus cultivated during the Eisenhower era and awakened, particularly in the press, a questioning, often cynical response to the prevailing wisdom of those in power." Viewing the media as an institution of social change, a new generation of younger and better-educated journalists rose up the ranks influenced by the social and cultural changes under way in the country. Presenting to the public one scandal after another—including the 1960 U-2 spy plane incident, the 1961 Bay of Pigs incident, the exposure of the My Lai Massacre in the midst of the Vietnam war in 1969, and the revelation of the Watergate scandal in 1974—the media created a "credibility gap" (Aucoin, "Re-Emergence"), undermining the American public's trust in its government and other social institutions.

As David Protess writes in his book, *The Journalism of Outrage: Investigative Reporting in America,* journalists came to be seen as "vigilantes" bringing "wrongdoing to public attention" (Protess 3). In this role, "the press was called upon to reassert itself as the watchdog of government, a role originally proposed by the framers of the U.S. Constitution in the eighteenth century, but which had succumbed to partisanship and commercialism" (3). Quoted in Aucoin's article, "Re-emergence of American Investigative Journalism," Protess suggests that "the historical pendulum swung toward muckraking as two mutually reinforcing phenomena converged: the demand for information about societal ills from an alienated, literate population of consumers; and a fiercely competitive national media that sought to supply it" (Aucoin, "Re-emergence"). He posits that "society expected a more aggressive message from the media, and the tools became available to support it" (Aucoin, "Re-emergence"). Aucoin suggests that there was "a direct connection between the re-emergence of investigative journalism in the United States and the discontent of the 1960s."

While historians have placed the rebirth of investigative journalism in its political and social context, there have been comparatively few studies of how such exposés functioned in practice. How are government secrets first exposed? By what processes are journalists able to uncover new information? And how are they able to keep such stories in the public eye? In this essay I will attempt to

answer such questions by looking at the news media coverage of a top-secret CIA program, commonly known as MKULTRA. MKULTRA was a controversial CIA research program with over 149 subprojects in which government scientists conducted experiments on "behavior modification" or "brainwashing" from the 1940s through the 1970s (Marks, 222).

I will offer a narrative of the first revelations about MKULTRA in 1974 to the Senate Hearings on the topic in 1977, highlighting the elements of the narrative that perpetuated further investigations, both journalistic and governmental. The long running journalistic investigations into MKULTRA can be attributed principally to three factors: discrepancies in information that suggested an incomplete understanding of the program, the personalization of the story around an individual, and the existing Freedom of Information Act legislation that was passed in 1966 and which, upon request, released previously undisclosed information. The narrative helps recast the history of investigative journalism not as the heroic story of reporters challenging an unjust system, but rather as the product of a complex web of relations between journalists, politicians, and government officials, subject to the constraints and pressures of the newspaper business.[14]

Domestic Spying Allegations

The first revelations about the MKULTRA program resulted from investigative journalist Seymour Hersh's discovery of an entirely separate illegal CIA program. A prominent investigative journalist who had exposed the My Lai massacre just five years prior, Hersh's article, "Huge C.I.A Operation Reported in U.S. Against Antiwar Forces, Other Dissidents in Nixon Years," landed on the front page of the *New York Times* on December 21, 1974, bringing revelations of the illegal government activities into the public sphere. Following an anonymous lead, extensive investigations by the *New York Times* reported an

[14] In my attempts to understand the public face of the top-secret CIA program MK-ULTRA throughout its lifespan in mainstream news media, I have primarily used *The New York Times*. *The New York Times* is used for two reasons. First, this was one of the most prominent newspapers to report and investigate the unfolding of the program to the public, and second, *The New York Times* archives their newspapers which allows me to follow the public coverage of MK-ULTRA chronologically, thus providing a narrative of how the public story of a top-secret program evolved over time.

illegal program in which the CIA, in complete violation of its charter, had allegedly spied on American citizens under the Nixon administration (Hersh, "Huge C.I.A Operation"). The publication of Hersh's findings stirred the pot and outraged certain government officials, including members of the standing subcommittee whose responsibility was to review CIA operations (Hersh, "Proxmire to Seek Inquiry on C.I.A. Over Role in US"). With the CIA's role in domestic activities under the Nixon administration in question, subsequent articles were published that tracked the repercussions of the allegations, leading Senator William Proxmire to call for the resignation of former CIA director and then-current Ambassador to Iran, Richard Helms, as well as prompting Proxmire and other government officials to demand a Justice Department investigation into the alleged domestic spying by the CIA (Hersh, "Proxmire Seeks Inquiry"). This prompted further investigations into the allegations and resulted in President Gerald Ford's order to CIA Director William E. Colby to report on the published allegations of illegal CIA spying on American citizens. Additionally, the President called for a congressional investigation of the allegations. (Hersh, "President Tells Colby to Speed Report on CIA").

On January 5th, 1975, President Ford appointed a committee known as the Rockefeller Commission to carry out investigations into the allegations. Tracking the story, Hersh reported that government sources had substantiated the basic accuracy of charges (Hersh, "Ford Names Rockefeller to Head Inquiry into CIA"). Hersh also reported that Nelson Rockefeller, the head of the commission, had served on the President's Foreign Intelligence Advisory Board, leading government employees, including Clark Clifford (Hersh, "Clifford Favors Special Inquiry into CIA 'Spying'") and Senator Frank Church, to argue for the creation of a separate congressional committee. As a result, the Church Committee, alongside the Rockefeller Commission, undertook its own investigations in 1975.[15]

[15] In January of 1975, the senate voted for the creation of a special committee to investigate the operations of the CIA and the FBI. Senator Frank Church became head of the Church Committee or the United States Senate Select Committee to Study Governmental Operations with Respect to Intelligence Activities which was created shortly after the creation of the Rockefeller Commission.

The Rockefeller Commission Report

The press, clearly still interested in this case, published a front-page *New York Times* article, "Rockefeller Inquiry Clears C.I.A. of Major Violations" by Nicholas M. Horrock, a new investigative journalist on the scene. Preempting the public release of the Rockefeller Commission Report, Horrock's article quoted Rockefeller on the commission's conclusions, broadly stating that no widespread pattern of illegal activity had been found (Horrock, "Rockefeller Inquiry Clears CIA of Major Violations"). In the days following the release of the Rockefeller Commission Report, front-page articles reported directly from the released commission report. Despite Rockefeller's language of de-escalation, the congressional report uncovered seven major findings of illegal or questionable CIA activities, several of which were picked up and reported by investigative journalists. However, despite abuses such as opening mail, wiretapping, burglaries, surveillance of domestic dissident groups, links between the CIA and the JFK assassination, plots to kill foreign leaders, relationships between the CIA and local police departments, and secret agreements between the CIA and the Department of Justice, the report concluded that "the evidence within the scope of this inquiry does not indicate that a fundamental rewriting of the National Security Act is either necessary or appropriate" (Horrock, "Rockefeller Inquiry Clears CIA"). Instead, the committee made a series of recommendations, primarily that the role of the CIA be clarified.

In an editorial, Horrock suggested that the Rockefeller Commission Report had only scratched the surface of the many illegal activities and programs run by the CIA since its creation in 1947, stating, "the Rockefeller report may well be the strongest argument for a more probing investigation. It opened more doors than it closed" (Horrock, "The Church Committee Must Address That Among Other Questions"). The most intriguing aspect of the report was not what it revealed, but rather the brevity of the report's coverage of multiple illegal CIA programs and activities, which suggested the possibility that more information remained to be revealed.

In a short section of about three pages buried within the 300+ page report was a discussion of a multiple-year-long drug program, hardly detectable among the litany of other CIA programs. Written in dry, legalistic language, this section reported the discovery of a program created in the 1940's to "study the properties of certain

behavior-influencing drugs (such as LSD) and how such drugs might be put to intelligence use." The program was noted as being a part of a much larger CIA program "to study possible means for controlling human behavior," exploring the effects of radiation, electric-shock, psychology, psychiatry, sociology and harassment substances (Commission on CIA Activities 37). This, it would later be revealed, was the first public reference to the MKULTRA program, although the report called it simply a "drug program." The report stated that the program was created as a response to "reports that the Soviet Union was experimenting with such drugs" and that "great concern over Soviet and North Korean techniques in 'brainwashing'… manifested into the early 1950's" prompted the CIA's interest. As part of the program, LSD was administered to "unsuspecting subjects in normal social situations," and in 1955, tests were begun on these subjects under an "informal arrangement with the Federal Bureau of Drug Abuse Control" (38).

In addition, this section of the report mentioned a 1973 CIA order to destroy "all records concerning the program," explaining the Commission's limited ability to further investigate. The section ended by stating that the program had been terminated in 1967 and that "it is presently the policy of the CIA not to test any substance on unsuspecting persons" (39).

The disclosure by the official Rockefeller Commission Report in early June 1975 offered much information that was previously unknown to both members of the government and the public, expanding the media presence of the investigations into illegal CIA activities. Additional articles reporting further investigations by journalists and their findings were published throughout the months of June and July[3], marking the beginning of what would become a multiple-year investigation into the actions of the CIA.

Summaries of major findings within the Rockefeller Commission Report outlined by investigative journalists such as Hersh and Horrock gave yet wider publicity to the CIA actions in question. In "Tightened Controls Over Agency Urged," Horrock pulled highlights from what he called "the most revealing official document on CIA domestic activities ever published." Horrock's article covered the major findings of the report, including a summary of findings on the drug program, noting in particular the declaration that the program had been terminated after the Inspector General's review in 1963, and the report

of a death associated with the program (Horrock, “Tightened Controls over Agency Urged”).

The Death of Frank Olson

Of all the details in the Rockefeller Commission Report’s section on the drug program, this last one stood out and would later become the center of both newspaper reports and ongoing investigations. The Rockefeller report did not mention a name, but cited the death of a Department of Defense employee that took place in 1953 as a result of the program. It disclosed that the anonymous employee had been administered LSD without his knowledge and had developed serious side effects. Finally, “several days later, he jumped from a tenth floor window of his room and died as a result” (Commission on CIA Activities 38).

Subsequent to the publication of the Rockefeller Commission Report, family members of Dr. Frank Olson, a bacteriologist who had been employed by the Department of Defense at Fort Detrick and whose death matched that described in the report, began their own inquiry into the circumstances surrounding the death of their loved one. Mrs. Olson said that, in addition to the information about Olson’s death that the family was already aware of, her daughter’s inquiry to Col. Vincent Ruwet, Mr. Olson’s superior and an old family friend, confirmed that Olson was the name of the employee described in the report (Treaster, “Death Inquiry is Reopened in LSD Case”). Upon this discovery, the family announced they would sue the government for the “wrongful death” (“CIA’s Reach Is Apparently Boundless”), a declaration that generated considerable journalistic interest.

In the weeks that followed multiple articles focused on the association of the death of the newly identified Frank Olson with the larger, bizarre-sounding illegal program that aimed to find a means for controlling human behavior. Offered a personal hook for the story, journalistic reporting quickly outran that of the government and information available to the public about the CIA program surpassed the information previously disclosed in the Rockefeller Commission Report. The Olson connection also offered the opportunity to find new leads. Horrock’s July 17th article reported that Olson’s family “found a ‘tentative’ list of persons who may have attended the session in 1953 at

which Mr. Olson was said to have been given LSD" (Horrock, "Destruction of LSD Data Laid to C.I.A. Aide in '73"). The names found on the list were those of Dr. S. Gottlieb, Dr. R. Lashbrook, Dr. A. Hughes and Dr. H. Bortner.

After being identified, Lashbrook weighed in, appearing in two articles that contributed his side of the story to the growing body of information about the project. According to New York City police reports, both Mr. Lashbrook and Sidney Gottelieb were with Mr. Olson the night he died (Treaster, "Ex-C.I.A. Aide Says Scientist Who Died Knew About Experiments With LSD"). From a phone interview with Lashbrook, *The New York Times* stated that Lashbrook's interview "appeared to contradict a report by the Rockefeller Commission that the drug had been given to the scientist, Frank R. Olson, without his knowledge." Lashbrook stated that everyone involved in the technical meeting at which Olson was given the LSD, including Olson himself, had agreed in advance that such a test would be conducted and that the only thing not specified during the meeting was when the administration of the drug would take place (Treaster, "Ex-C.I.A. Aide").

Knowledge of Olson's identity in connection with the drug program prompted the Chief Medical Examiner on Olson's case, Dr. Dominick Di Maio, to reopen the case (Treaster, "Death Inquiry Reopened"). Dr. DiMaio said that "Lashbrook, who shared room 1018A in the Statler Hotel with Mr. Olson, formally identified the body," but, at the time, omitted four major pieces of information, including that Mr. Olson had received LSD and that he had been seeing a psychiatrist (Treaster, "Death Inquiry Reopened"). The information Lashbrook offered in his account to Mrs. Olson and his account to the police conflicted with one another and also with the Rockefeller Commission Report, inviting further inquiry. Other discrepancies in information appeared in an article by another journalist on the case, Joseph B. Treaster. His January 10th, 1976 article, "CIA's Files on LSD Death Found to be Contradictory," revealed new information found in 150 documents released by President Ford to Alice W. Olson, widow of Frank Olson. Treaster contended that, in contradiction to the Rockefeller Commission Report's finding that personnel reprimands had been carried out following Olson's death, these documents disclosed that Admiral Luis de Florex, then the agency's Chairman of Research, "argued against reprimanding those responsible (for Olson's death) because it might dampen the 'initiative and enthusiasm so necessary for our work'" (Treaster, "CIA's Files on LSD Death Found to

be Contradictory"). The discovery of Olson's death and the discrepancies that emerged surrounding it sustained the narrative in newspapers and offered new leads for further investigations.

LSD Research

With the revelation of Olson's identity, newspaper articles sharing new discoveries and contradictory details of the CIA drug-testing program were published at least once a week through the months of June and July of 1975, keeping the story alive. It seemed the more specific information that was disclosed, the more information was revealed by those involved, which generated more leads for journalists to follow. The information discussed in these articles challenged the veracity of the Rockefeller Commission Report. Horrock reported that the *Washington Post* detailed "two other projects in the late nineteen-fifties in which it is said that LSD had been administered to hundreds of soldiers and civilians by the Department of the Army" (Horrock, "Destruction of LSD Data"). The article stated that "Dr. Gerald D. Klee, a Baltimore psychiatrist who was involved in the project, told *The New York Times* that the research team also used soldiers for tests of mescaline…and tetro-hydro cannibinol" in addition to LSD. The article also mentioned Walter Weintraub, a doctor involved in the same project as Dr. Klee who disclosed that the Army gathered "volunteers by promising them extra leaves and other inducements" (Horrock, "Destruction of LSD Data").

The article by Boyce Rensberger, "C.I.A. in the Early Nineteen-Fifties Was Among Pioneers in Research on LSD's Effects," was the first to discuss LSD's potential use as an agent in chemical warfare. Rensberger tracked down Dr. Sidney Cohen, another pioneer in LSD research at UCLA, who elaborated on its potential military uses. Cohen stated that "LSD was of interest to military and intelligence agencies because it was thought it might be a way of 'breaking down a person's defenses during interrogation." Cohen indicated that LSD "would also have obvious value as a way of temporarily incapacitating individuals" and was "studied by chemical warfare scientists for use in a gas or aerosol form to knock out enemy armies." Rensberger was not the only journalist who took note of research in the program that encompassed potential offensive military uses of the drug. The following month, in Treaster's August 11th article "Mind-Drug Tests a Federal Project for

Almost 25 Years," he stated that his research provided a story that "makes clear that the intent of the drug experiments went beyond the Government's contention that they were merely defensive in nature." He found that "in fact, there is ample evidence that military and intelligence planners hoped to add these drugs to the United States' arsenal of offensive weapons" (Treaster, "Mind-Drug Tests a Federal Project for Almost 25 Years"). His findings contradicted the Rockefeller Commission's finding that "the primary purpose of the drug program was to counter the use of behavior-influencing drugs clandestinely administered by an enemy" (Commission on CIA Activities 37).

Discrepancies over dates also appeared in the same article. Treaster noted that while the Rockefeller Commission Report stated that testing had been halted in 1963, "intelligence sources said that experiments with 'exotic drugs' continued after the internal ban and that this may have been reflected in records that were believed to have been destroyed" (Treaster, "Mind-Drug Tests"). The article stated, "at first the armed forces refused to comment, but eventually spokesmen confirmed several drug projects." From these sources the article also reported that "the Army says it went on with other drugs that could cause hallucinations until about two weeks ago" (Treaster, "Mind-Drug Tests"), much longer than the Commission Report's stated end of the program as having been in 1967. In addition, "the Air Force says it continued to sponsor university research in LSD through 1972." In statements from the Army, the stated length of the project changed from a decade to 25 years and counted more than 4,000 persons as having been subjected to such tests (Treaster, "Mind-Drug Tests").

The discrepancies in these details also caught the attention of powerful members of Congress. Senator Edward Kennedy, a member of a Senate subcommittee holding investigations into the CIA, reported more contradictory information. Out of the three sets of materials the CIA sent to the Senate subcommittees, Kennedy found "there were serious discrepancies between the different versions" (Schmeck Jr., "Bureau of Narcotics Tied To CIA's Drug Program"). In addition, one of the documents revealed that it was not until 1973, six years later than the Rockefeller Commission Report had originally stated that the drug testing program had been terminated, that "experiments with drugs or other techniques for influencing human behavior required the specific approval of the agency director and that tests on unwitting American citizens were prohibited" (Schmeck Jr., "Bureau of Narcotics"). Commenting on the documents given to Mrs. Olson, Treaster found

that “taken as a whole, the file is a jumble of deletions, conflicting statements, unintelligible passages and such unexplained terms as the ‘Artichoke Committee’ and ‘Project Bluebird’ that tend to confuse more than enlighten” (Schmeck Jr., “Bureau of Narcotics”). Discrepancies between the government and *New York Times* reports thus spurred further investigations at both levels.

Marks’ New Documents

Discoveries continued throughout 1976. No substantial new information appeared, however, until July of 1977 when, through a Freedom of Information Act request to the CIA, the activist John D. Marks received about 1,000 documents on the program that were not previously available to governmental investigations. Marks had a history in foreign intelligence, having served as a foreign-service officer of the U.S. Department of State (Marks 222). He published a book in 1974 on abuses of power within the CIA based on this experience. Marks states in his book about MKULTRA, *The Search for the Manchurian Candidate,* that he filed a Freedom of Information Act request because he was intrigued by information disclosed in the Rockefeller Commission Report which suggested that the drug program was part of a much larger CIA program to study possible means for controlling human behavior (Marks 222). After reviewing these documents, Marks asserted that “Adm. Stansfield Turner, Director of Central Intelligence… ‘seriously distorted’ what the CIA research programs involved” (Horrock, “C.I.A. Data Show 14-Year Project On Controlling Human Behavior”). He accused Admiral Turner of obfuscation when Turner called the agency’s activity “a program of experimentation with drugs.” Marks concluded, “drugs were part of it…but so were such other techniques as electric shock, radiation, ultrasonics, psychosurgery, psychology and incapacitating agents, all of which were referred to in documents I have received” (Horrock, “C.I.A. Data Show”). The program was portrayed in a whole new light, as the newly released documents entailed discussions of “ways of killing people without leaving a trace” and the testing of drugs on incarcerated convicts to see if they caused loss of speech, memory, or will power. Also in the documents, the name MKULTRA, as well as the names Bluebird, Artichoke and MK Delta, were finally connected to the CIA drug-testing program. Marks was promised 5,000 additional, recently discovered documents by the end of the month.

The new release of documents led to more revelations throughout the months of July and August, 1977. New information reported higher estimates of the number of institutions involved (Horrock, “Private Institutions used in C.I.A. Effort to Control Behavior”) and the amount of money that had been funneled into the project, which was now thought to be $25 million. In addition, it was disclosed that a wider population had been unwittingly tested, including mental patients (Horrock, “Drugs Tested by C.I.A. on Mental Patients”), sexual psychopaths (Horrock, “Records Show C.I.A. Tested LSD on Sex Psychopaths”), and college students (Treaster, “Researchers Say that Students Were Among 200 Who Took LSD in Tests Financed by C.I.A. in Early 50’s”). The revelations unveiled by the documents released under the FOIA required yet another Senate subcommittee’s (Senator Edward Kennedy’s Health subcommittee) further investigations into illegal C.I.A. activities. However, the Senate hearing had to be postponed when 10,000 additional documents about the secret CIA program were released only seven days before the scheduled hearing (Thomas, “C.I.A Says it Found More Secret Papers on Behavior Control”). Marks claimed “it had taken him nearly two years of legal pressure to dislodge the material he had received” (Horrock, “C.I.A. Data Show 14-Year Project On Controlling Human Behavior”), indicating that Marks had been requesting this information since the time of the first congressional hearings.

Through 1975 and 1976 the Church Committee published 14 reports on abuses of U.S. intelligence agencies, though much of the information remained classified until the President John F. Kennedy Assassination Records Collection Act of 1992 disclosed over 50,000 pages from the reports, thus only becoming useful many years after the MKULTRA story had faded from the mainstream media. The Senate Hearings conducted by the Select Committee on Intelligence and the Subcommittee on Health and Scientific Research of the Committee on Human Resources published their reports in August and September of 1977. It was the goal of the 1977 Senate Hearings to “give the committee and the public an understanding of what new information has been discovered that adds to the knowledge already available,” as well as to “address the issues raised by any additional illegal or improper activities that have emerged…and to develop remedies to prevent such improper activities from occurring again” (Senate Select Committee on MKULTRA 69). It was declared, “the best safeguard against abuses in the future is a complete public accounting of the abuses of the past” (73).

Ironically, even as vast quantities of new information flooded the public sphere, very few newspaper articles offered new insights. Unlike the response to the Rockefeller Commission Report in 1975, upon the closing of the 1977 Senate Hearings there were no articles summarizing the group's conclusions in the *New York Times*. In his book *The Search for the Manchurian Candidate,* John D. Marks offers an analysis of the Senate hearings, stating that the Senate sub-committees were limited in their investigations by both their small staff and the timing of the release of the 8,000 pages of documents in the weeks before the hearings (Marks 222), and overall, "the Kennedy hearings added little to the general state of knowledge on the CIA's behavior-control programs. CIA officials, both past and present, took the position that basically nothing of substance was learned during the 25-odd years of research…and they were not challenged" (223).

Perhaps, as Roy Lotz writes in his book *Crime and the American Press*, the lack of reporting was due in part to the complexity of such a story, discouraging journalists from covering a story in which the information did not "translate easily into plain English for the ordinary reader" (Lotz 121). Without an easily identifiable explanation, the *New York Time's* interest in the top-secret CIA program, which had lasted over two years since investigative journalists had first noticed references to a "drug program" in the Rockefeller Commission Report, ended here. Instead, the story was picked up in other media more suited to the complexity and extent of the revelations, most notably the 1979 book by Marks, *The Search for the Manchurian Candidate.*

Conclusion

Due to the destruction of the bulk of the project's files in 1973, much of the truth about the extent of the MKULTRA projects will never be known. Nevertheless, even as late as 1991, pieces of the story surfaced (Cockburn 160), suggesting that a more complete picture, even without the destroyed documents, may yet emerge. In any case, the historical narrative of the public face of MKULTRA demonstrates how effective and important investigative journalism can be in revealing secret information, in this case an illegal CIA research program that may otherwise have been buried. It was because of the investigative work of journalist Seymour Hersh and others that illegal CIA activities

came to light, and through these findings the top-secret CIA drug-testing program was brought to the attention of the public.

But the diligence of such journalists was only one part of the story. The revelations about MKULTRA were also due in large part to government reports and investigations that revealed more than they intended, opening up new leads for reporters. Moreover, the discrepancies between the government reports and the ongoing journalistic investigations became one of the primary motivators of new research. The story of the public face of MKULTRA shows that it cannot be seen simply as a secretive government confronted by intrepid journalists in the search of truth. Likewise, the journalists themselves cannot be seen simply as disinterested crusaders for truth. The coalescing of the story around Olsen was a result of both the ongoing investigation, and the need to find a selling point or hook. The story of an arcane government program became a pressing public issue once a face could be put to one of its victims. When the story eventually became so complex that personal stories could no longer do it justice, it dropped out of the public eye. Rather than prompting more public outrage, the revelation of the full extent of the MKULTRA program, rendered it ungraspable, and thus unsuitable for the daily press. For in the world of government secrets, public interest rests not only on what is revealed, but how it is presented.

Works Cited

Aucoin, James L. “Re-emergence of Investigative Journalism 1960-1975.” *Journalism History* 21.1 (1995). Print.

---. *The Evolution of American Investigative Journalism*. Missouri: University of Missouri Press, 2005. Print.

“C.I.A’s Reach Is Apparently Boundless.” *The New York Times*, 12 July 1975: n-pag. Print.

Cockburn, Alexander. *Whiteout: The CIA, Drugs, and the Press*. New York: Verso, 1998. Print.

Hersh, Seymour M. “Clifford Favors a Special Inquiry into CIA ‘Spying.’” *The New York Times* 26 Dec. 1974: n-pag. Print.

---. “Ford Names Rockefeller to Head Inquiry into C.I.A; Wants Reports in 90 Days.” *The New York Times*, 5 Jan. 1975: n-pag. Print.

---. “Huge C.I.A Operation Reported in U.S. Against Antiwar Forces, Other Dissidents in Nixon Years.” *The New York Times*, 21 Dec. 1974: 1. Print.

---. “President Tells Colby to Speed Report on CIA.” *The New York Times*, 23 Dec. 1974: 1. Print.

---. “Proxmire to Seek Inquiry on C.I.A. Over Role in U.S.: Calls for Helms to Resign as Envoy After Reports of Domestic Dossiers.” *The New York Times*, 22 Dec. 1974: 1. Print.

Horrock, Nicholas. “The Church Committee Must Address That, Among Other Questions; How Deeply Should the C.I.A. Be Looked Into?” *The New York Times*, 21 June 1975: n-pag. Print.

---. “C.I.A. Data Show 14-Year Project On Controlling Human Behavior.” *The New York Times,* 20 July 1977: n-pag. Print.

---. “Destruction of LSD Data Laid to C.I.A. Aide in ’73.” *The New York Times*, 17 July 1975: 1. Print.

---. “Drugs Tested by C.I.A. on Mental Patients.” *The New York Times*, 3 Aug. 1977: n-pag. Print.

---. “Private Institutions used in C.I.A. Effort to Control Behavior.” *The New York Times*, 1 Aug. 1977: n-pag. Print.

---. “Records Show C.I.A. Tested LSD on Sex Psychopaths.” *The New York Times*, 5 Aug. 1977: n-pag. Print.

---. “Rockefeller Inquiry Clears C.I.A. of Major Violations.” *The New York Times,* 6 June 1975: 1. Print.

---. “Tightened Controls Over Agency Urged.” *The New York Times*, 10 June 1975: n-pag. Print.

Lotz, Roy Edward. *Crime and the American Press*. New York: Praeger, 1991. Print.

Marks, John D. *The Search for the Manchurian Candidate: The CIA and Mind Control*. New York: W.W. Norton & Company, 1979. Print.

Protess, David L. *The Journalism of outrage: investigative reporting in America*. New York: Guilford Press, 1991. Print.

Report to the President by the Commission on CIA Activities Within the United States, Washington D.C., 6 June 1975. Print.

Schmeck Jr., Harold M. “Bureau of Narcotics Tied To CIA’s Drug Program.” *The New York Times*, 7 Nov. 1975: n-pag. Print.

Thomas, Jo. “C.I.A Says it Found More Secret Papers on Behavior Control.” *The New York Times*, 2 Sep. 1977: n-pag. Print.

Treaster, Joseph B. “CIA’s Files on LSD Death Found to be Contradictory.” *The New York Times*, 10 Jan. 1976: n-pag. Print.

---. “Death Inquiry is Reopened in LSD Case,” *The New York Times,* 13 July 1975: n-pag. Print.

---. “Ex-C.I.A. Aide Says Scientist Who Died Knew About Experiments With LSD.” *The New York Times*, 18 July 1975: n-pag. Print.

---. “Mind-Drug Tests a Federal Project for Almost 25 Years.” *The New York Times*, 11 Aug. 1975: n-pag. Print.

---. “Researchers Say that Students Were Among 200 Who Took LSD in Tests Financed by C.I.A. in Early ‘50’s.” *The New York Times*, 7 Aug. 1977: n-pag. Print.

United States Congress Senate Select Committee on Intelligence, *Project MKULTRA, the CIA's program of research in behavioral modification: joint hearing before the Select Committee on Intelligence and the Subcommittee on Health and Scientific Research of the Committee on Human Resources,* United States Senate, Ninety-fifth Congress, first session, 3 Aug. 1977. Print.

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