The Nihilistic Portrayal of Scientific Advancement in Science Fiction

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Scientific advancement often faces a nihilistic portrayal in science fiction. For a story to have a nihilistic portrayal, advancement must be the primary cause of the conflict in the story and must generally worsen the situation. It is important to note that despite creating conflict, scientific advancement is rarely negative from the start. In almost every case, an advancement is corrupted in one of many ways to result in a negative outcome. In the vast majority of stories, science itself is not at fault, but rather the human interaction with science. The opinion of authors and directors who portray the outcome of scientific advancement in a negative light is that humanity is flawed and prone to creating complications with complex issues and situations.

These negative outcomes are also present outside of science fiction in the real world. Fortunately, some actions can be taken to mitigate or avoid the human tendencies behind these outcomes which share some common causes. Overuse of scientific advancements is the easiest cause to resolve as it simply requires decreasing reliance on technology. Additionally, overstepping of boundaries is often avoided through ethical requirements for scientists to prevent hubris from creating negative consequences. Finally, scientists must take their time with advancements to avoid rushing through the process of innovation. A balance of safety and productivity is essential to avoid negative consequences. With these precautions, the common negative outcomes of science fiction can be mitigated in the real world.

Unfortunately, this mitigation does not mean elimination. Even with precautions, some real-world scientific advancements, such as the nuclear bomb, still had negative consequences. These negative outcomes are likely the underlying inspiration for the frequent nihilistic portrayals in science fiction. Scott Clair of Western Washington University explains,

> The fiction after the first World War takes on a distinctly pessimistic tone compared to the fiction produced before the war. World War I demonstrated what else technology was capable of…."Exotic weapons" became popular during the interwar period..., chief among them the Death Ray. (Clair 5)

Thus, science fiction is a representation of the fears of the authors based on their experiences and knowledge. As a result, many of the scientific advancements in science fiction with negative consequences reach those outcomes due to one of the same three main causes as in the real world.

The overapplication of scientific advancements frequently creates conflict in various stories as anything can become negative in excess. These technologies are not inherently harmful or malicious and frequently offer large potential benefits but are unfortunately corrupted by unnecessary application to situations. In *The Circle*, the protagonist Mae quickly rises through the ranks of the largest company in the world, The Circle, and becomes a dedicated and influential member of the social media company. Unfortunately, The Circle overuses their impressive technology until it results in irreversible negative consequences. Many other stories follow this same path of having an incredible technology that simply becomes negative due to the application.

Negative outcomes can also arise when scientists overstep their bounds due to excessive pride. In *Frankenstein*, Victor, the protagonist, thinks extremely highly of his capabilities and intelligence and decides that he "[...] will pioneer a new way, explore unknown powers, and unfold to the world the deepest mysteries of creation" (Shelley 42). He oversteps the bounds of what a scientist should attempt and elevates himself to the position of a higher power who has

the capability to create life. As a result, he creates a monster that he is incapable of controlling and ultimately loses everyone he loves to his creation. His excessive pride and confidence embolden him to change positive scientific advancement into a corrupted tragedy. This tragic storyline of a scientist ignoring important boundaries due to hubris is also prevalent in many science fiction stories.

Scientific advancement also frequently becomes corrupted when progress is rushed. Whether progress is rushed for the selfish pursuit of glory or the selfless goal of helping others, the rushing creates the same complications. It can cause scientists to not take necessary precautions by testing their advancement inadequately or failing to develop an adequate understanding of the new technology as they rush to complete the advancement. In *Flowers for Algernon*, Charlie Gordon is transformed from being mentally handicapped to becoming a genius with above-average intelligence due to a new procedure that had just been developed. He is able to experience normal life for the first time for a short period, but he soon discovers a flaw in the procedure caused by the scientist rushing the research and development process. This flaw later results in a heartbreaking outcome that was entirely avoidable with proper precautions. This rushing of the scientific process is the third and final major cause of negative outcomes in science fiction and is common in many other tales.

While most scientific advancement is done with positive intent, many authors and directors portray it in a negative light due to underlying human tendencies that threaten to corrupt scientific advancement. Fortunately, these tendencies can be controlled to mitigate the number of negative outcomes in the real world. These science fiction stories with negative portrayals only illustrate part of human nature by excluding much of the moral aspect of

humanity. Thus, they serve as powerful warnings to the danger that science can pose when improperly regulated. There are multiple ways in which humanity corrupts advancement in various science fiction stories which can be divided into three categories. The scientists or society overapply new technology, overstep their bounds in the pursuit of glory, or rush the process of scientific advancement. These three ways in which advancement can become negative display different human tendencies which must be controlled and provide a cautionary tale of why precautions are necessary to make scientific advancement safe in the real world.

Chapter 1: Overuse and Overapplication

The idea that one can have too much of anything is entirely true for technology. While most scientific advancements are made with good intentions, they can be overused. Typically, one excessively uses new technology in an effort to simplify tasks and be more efficient. However, this attempt to simplify tasks can further complicate matters by bringing in extra variables in the process when they are not necessary. Additionally, scientific advancements can have direct negative consequences when overapplied to certain situations. Science fiction often focuses on these stories and presents cautionary tales for the unrestrained use of scientific advancement. *The Circle*, written by Dave Eggers, *The Entire History of You*, directed by Charlie Brooker and Jesse Armstrong, and *Ready Player One*, by Ernest Cline, all offer different perspectives on the overapplication of scientific advancement but they all involve a technology that was positive initially and corrupted by the way it was used.

Each of these stories revolves around a single scientific advancement that promises large changes. In *The Circle*, an incredibly powerful, monopolistic, company called The Circle develops an inexpensive, new camera that is the size of a thumb and battery-powered with extremely high resolution. These devices are called "SeeChange cameras" and are made to be connected to social media so users can share live feeds from their cameras with anyone they choose (Eggers 62-71). *The Entire History of You* contains a small implant called a "Grain" that allows the user to automatically record everything they see and replay it either on their retinas for private viewing or cast it onto any screen. This means that the user is never at risk of forgetting anything that they witness and can look back and scrutinize any moment (Brooker & Armstrong). *Ready Player One* centers around the OASIS, a "[...] multiplayer online game that

had gradually evolved into the globally networked virtual reality most of humanity now used on a daily basis" (Cline 1). The OASIS has become a second world for those living in the story and many spend more hours in the virtual world than they do in the real world.

As they are incredible innovations, each of these devices have incredible potential benefits to society. SeeChange offers a chance to reduce all crime by increasing surveillance to deter crime and allows anyone to see any part of the world at any time. The developer of SeeChange explains that "'[...] instead of searching the web, only to find some edited video with terrible quality, now you go to SeeChange, you type in Myanmar. [....] Why shouldn't your curiosity about the world be rewarded? [....] You want to check on your kid at school? SeeChange. This is ultimate transparency. No filter. See everything. Always'" (Eggers 69). The Grain offers a chance for anyone to be able to relive past moments with their relatives or see old memories in perfect clarity and perfects human memory (Brooker & Armstrong). Finally, the OASIS offers a perfect escape from any tragedy in the real world and offers a safe place to go at any time. Wade Watts, the protagonist, states that "the OASIS kept me sane. It was my playground and my preschool, a magical place where anything was possible" (Cline 18). Unfortunately for all three of these potentially groundbreaking innovations, their eventual overapplication will corrupt any possible positive future.

These scientific advancements did not suddenly result in negative outcomes; they all have a buildup brought on by overuse and overapplication of the technology that leads to a turning point for the final result. In *The Circle*, the company begins to push for political figures to "go transparent," which means to wear a SeeChange camera at all times to broadcast their every action. From here, the use of the technology escalates until the protagonist, Mae uses the

cameras, combined with thousands of helpers, to find her friend Mercer who has decided to disappear to escape from the seemingly inescapable reach of The Circle and its cameras. When she does find Mercer, he is pushed over the edge and SeeChange finally achieves its negative result. Mercer drives his truck off a bridge and commits suicide as he feels it is his only way to avoid the technology (Eggers 464-466). *The Entire History of You* reaches its turning point when the protagonist, Liam, uses the Grain to over-analyze one look that his wife gives another man. After days of obsessing, he discovers that his wife cheated on him with this man and that his child is not his own but rather the other man's (Brooker & Armstrong). This discovery is only possible because Liam uses his Grain and the Grains of his wife and the other man to uncover the truth. Finally, in *Ready Player One*, the creator of the OASIS reveals to Wade that after living out almost all of his life, he realizes that living in the OASIS cannot be an adequate substitute for the real world. By this point, the inventor has no chance to change his life and is left with a negative conclusion that "'[...] as terrifying and painful as reality can be, it's also the only place where you can find true happiness. Because reality is real"' (Cline 364). He is only left to this realization because the OASIS stopped becoming simply a place to play games and was overused to become a second reality. These buildups could have been avoided by simply reducing the use of the advancement to a healthy amount, but that, unfortunately, did not occur.

These turning points each culminate in the creator or user realizing their mistake and taking steps to reverse the process, but it is typically too late. One of the co-founders of The Circle approaches Mae after Mercer's suicide and tells her that "'[...] I didn't intend any of this to happen. [....] it's far beyond what I had in mind when I started all this, and it's far beyond what's right. It has to be brought back into some kind of balance"' (Eggers 485). However, Mae

believes that things have not gone too far despite the negative outcomes. She feels a compulsion to continue to simplify lives by increasing the uses for SeeChange and decides to further the overuse. Thus, the story ends with Mae reporting the co-founder to the other founders and having him excommunicated as The Circle continues on the path to utter tragedy. In *The Entire History of You*, Liam loses his family as his wife and child leave him, and he decides to remove his Grain himself. This is a very dangerous decision as removing it could leave him blind, but he feels that this drastic action is the only way to escape from the memories of his former, happy life (Brooker & Armstrong). Unfortunately, his decision does not stop anyone else from possibly having a similar experience in the future. Liam loses his family and the advancement that was supposed to enhance his life, but the rest of the world is still at risk of overusing the same technology and repeating the same tragic outcome. *Ready Player One* is unique in that it offers a possible solution going forward. The creator shows Wade a big red button in the OASIS that would delete all of the code for it and force everyone to return to the real world. He tells Wade to make sure he is confident it is the right time to push the button first but to not "'[...] make the same mistake I did. Don't hide in here forever"' (Cline 364). The OASIS has already had a negative outcome for all those who have already wasted their lives in the virtual world, but there is a rare hope to make a positive change going forward. But in doing so, Wade will still have to get rid of the advancement entirely because it is now overused and corrupted beyond repair.

The human race is prone to make the same mistake that is made in each of these science fiction stories because of the tendency to want to simplify all processes for efficiency. Wilson Zhu, a Marketing Manager at a global consulting firm, finds that people often apply innovations "[...] to the point where it goes beyond what's needed for the situation or the audience in

question" (Zhu). However, this actually only makes the process more complicated in the end and also risks resulting in errors because "[...] technology can occasionally malfunction, misdirect the user, or provide incorrect information or recommendations that lead the user to change a previously correct decision or follow a pathway that leads to an error" ("Understanding Human"). It is critical that we only use scientific advancements where they are necessary and useful to avoid errors and tragedy such as the outcomes of SeeChange, the Grain, and the OASIS.

Chapter 2: Hubris

Although science is driven by a desire to create incredible, new advancements and push society forward, it is possible to push society too far forward. The desire to innovate in new and exciting ways can incentivize scientists to ignore boundaries and attempt extremely ambitious projects. Unfortunately, these projects can easily go beyond the boundaries that science needs to ensure safety. Overstepping these boundaries is different from overapplying a technology because these innovations should never have been attempted in the first place. This danger is typically avoided through ethical boundaries in science but science fiction often provides an example of the possible outcomes of ignoring these essential boundaries. *Frankenstein*, by Mary Shelley, *Brave New World*, by Aldous Huxley, and *Jurassic Park*, directed by Steven Spielberg all tell stories of scientists attempting to play God with the goal of advancing science and benefiting society. However, despite the good intentions and possible benefits, their innovations result in a negative outcome due to a lack of regulation.

As with most science fiction, all three stories center around an incredible innovation that promises to be revolutionary. In *Frankenstein*, the protagonist, Dr. Frankenstein, becomes obsessed with achieving something so impressive that he will always be remembered for his contribution to science. As a result of this desire to succeed, he decides to attempt to create a human being and bring it to life. After many months of almost constant work, Frankenstein states that he has "[...] succeeded in discovering the cause of generation and life; nay, more, [and has become] capable of bestowing animation upon lifeless matter" (Shelley 47). In *Brave New World*, society around the world lives in communities where freedom has been replaced with a promise of stability. In this world, humans are made on an assembly line in human "hatcheries"

around the world and as the director of one of the hatcheries explains, "'We [...] predestine and condition. We decant our babies as socialized human beings, [...] as future sewage workers or future [...] Directors of Hatcheries [....]"' (Huxley 13). Finally, in *Jurassic Park*, scientists have discovered a way to bring back the dinosaurs based on a small amount of preserved DNA which allows them to see and experiment with living dinosaurs despite them going extinct so long ago (Spielberg).

All three of these scientific advancements are successfully completed and all promised impressive positive benefits. Dr. Frankenstein believed that bringing a body to life was the first step towards his ultimate goal that would make him famous. He explains that "[...] I thought, that if I could bestow animation upon lifeless matter, I might in process of time [...] renew life where death had apparently devoted the body to corruption" (Shelley 48). Discovering the ability to bring someone back from the dead would obviously be an incredible accomplishment that would bring him fame as well as benefit society as death would no longer be a concern and would also allow him to bring his mother back from the dead. In the setting of *Brave New World*, Mustapha Mond, one of the main leaders of the world, explains that "'The world's stable now. People are happy; they get what they want, and they never want what they can't get."' (Huxley 220). Although this message could be interpreted as propaganda from a powerful leader, his statement is technically true. By eliminating freedom from the lives of the people, they no longer have to fear instability or chaos and since every aspect of life is controlled, they do not have to experience even the slightest of inconveniences. Finally, in *Jurassic Park*, bringing back the dinosaurs allows scientists to study them and solve all the current mysteries about them. Not only would these discoveries be enlightening on their own, but they could also potentially contain

solutions to other problems in science (Spielberg). Unfortunately, these potential benefits that inspired the scientists in the first place will never manifest because they are ignoring essential boundaries.

In all three stories, there are warning signs during the process that were ignored and would have set the necessary boundaries. Victor Frankenstein faced countless challenges as he tried to bring his creature to life and knew that others would disapprove. So he kept it a secret for the two years that he worked on the project. He states that "I had worked hard for nearly two years, for the sole purpose of infusing life into an inanimate body. For this I had deprived myself of rest and health. I had desired it with an ardour that far exceeded moderation[....]" (Shelley 51). Had he recognized the extreme difficulty and the need for secrecy as warning signs and listened to them, he would have never completed the project and would have avoided the negative consequences he will later face. In *Brave New World*, the warning sign is more subtle. John, a central character who opposes the way the world works, realizes that in making everyone "happy," the leaders have taken away any chance of a fulfilling life by attempting to control too much. He believes that people need some challenges in life to grow and explains to Mustapha Mond that society is "'Getting rid of everything unpleasant instead of learning to put up with it. [...] [The leaders] just abolish the [challenges in life]. It's too easy"' (Huxley 238). Even worse, Mustapha Mond admits that he knows that the happiness people feel is not true happiness but he refuses to change anything to solve this problem (Huxley 220-221). In this case, the scientist saw the warning signs but refused to listen to them because he felt he knew better and could play God. However, Mond's arrogance will only result in negative outcomes as he has entirely failed to listen to the boundaries of science. Finally, *In Jurassic Park*, the scientists knew that there was

a risk bringing back the dinosaurs because they knew they were dangerous and that it took a great extinction to eliminate them the first time. Despite the clear history and the dangers, dinosaurs would pose to humans if they got out of control, the scientists decided to continue playing God and bring dinosaurs back from extinction to make a profitable tourist attraction and research the living dinosaurs (Spielberg). After all three stories ignore the warning signs that indicate the need for scientific boundaries, the negative consequences quickly become apparent.

Because of the magnitude of these innovations as life-changing for large communities and the rest of the world, the negative consequences are proportionally larger. In *Frankenstein*, the creature becomes resentful of Dr. Frankenstein after he abandons the creature in fear. To get revenge for this abandonment, the creature decides to kill all of Frankenstein's family and friends and destroys his life. By the end of the novel, Victor Frankenstein recognizes that he overstepped his bounds and warns Robert Walton, a sailor he meets near the end of his life, to not follow in his footsteps because he has "[...] lost everything, and cannot begin life anew" (Shelley 24). His arrogance led him to ruin his life through an innovation beyond the bounds of what should be attempted. The consequences in *Brave New World* are not as severe but are still incredibly far-reaching. The entire civilization has lost the ability to achieve true happiness in exchange for stability which is not a worthwhile sacrifice. The worst part is that Mustapha Mond, one of the only people who could reverse the consequences, had accepted that true happiness is unimportant. He states that,

> Actual happiness always looks pretty squalid in comparison with the overcompensations for misery. And, of course, stability isn't nearly so spectacular as instability. And being contented has none of the glamour of a food fight against misfortune, none of the

> picturesqueness of a struggle with temptation, or a fatal overthrow by passion or doubt. Happiness is never grand. (Huxley 221)

By attempting to remove an integral part of life, Mond and the other leaders have reduced life to a shell of what it should be without any meaningful pleasures. Likewise, in *Jurassic Park*, dinosaurs inevitably get out of control and kill people because scientists are unable to effectively contain them (Spielberg). As with the other two stories, this horrible outcome could have easily been avoided had the scientists simply set boundaries to ensure safety. Unfortunately, these science fiction stories do not describe a fictional threat.

As scientists continue to innovate and discover new technologies that were previously considered impossible, there is a growing risk of going too far in the advancement. Just as rushing into a scientific advancement can be dangerous, some projects should simply not be attempted for ethical or safety reasons. One such technology would be the nuclear bomb which overstepped the ethical bounds that scientists should follow by creating something impossible to entirely control and guaranteed to cause civilian casualties. The negative consequence of this innovation was the loss of thousands of innocent lives so far, and now that that boundary was crossed, there is no going back. Nuclear bombs are now forever a threat because scientists overstepped their boundaries and created an incredibly deadly weapon. Fortunately, there is a simple solution to the threat of overstepping ethical boundaries. Scientists simply have to set ethical standards to follow that will force them to fully consider the effects of their actions and prevent them from making decisions that will overstep. There are many examples of ethical requirements such as "[...] the proper treatment of living subjects, both humans and animals" because " Lusting after fame or recognition, egoism, greed, prejudice, snobbishness, racism, and

political considerations have frequently resulted in immorality in the domain of science" (Zohoor). If scientists continue to adopt ethical restrictions and follow them, humanity can avoid many scientific advancements that could result in negative outcomes. The stories of *Frankenstein*, *Brave New World*, and *Jurassic Park* all offer perfect examples of why some scientific lines simply should not be crossed.

Chapter 3: Rushing the Process

While attempting to complete a process in as little time as possible to achieve a benefit sooner is enticing, this rushing can lead to missteps and oversights. These complications are rarely intended and are not always entirely avoidable, but rushing a process greatly increases the risk. Unfortunately, as the possible benefits of the final result become larger, the temptation to reach that result faster only intensifies. As a result, it is extremely common for individuals to rush scientific advancement in an effort to make progress sooner. This acceleration does not always have repercussions, but science fiction often provides a warning of the possible outcomes of rushing the process. *Flowers for Algernon*, by Daniel Keyes, *Playtest*, directed by Dan Trachtenberg, and *The Matrix*, directed by Lilly and Lana Wachowski all tell stories of scientific advancement rushed to a negative outcome. There are different ways in which rushing the process produces a negative outcome; it can be a result of simply not taking the necessary precautions during the innovation process, not gathering an in-depth enough understanding of the advancement, or pursuing glory rather than aiming to help society. However, regardless of the cause, all three stories end with a negative outcome from what could have been a positive innovation.

All three stories center around one revolutionary piece of technology as most science fiction novels do. In *Flowers for Algernon*, scientists are working to develop a procedure that gives mentally retarded individuals above-average intelligence and they have already substantially increased the intelligence of a rat (Keyes 10). In *Playtest*, a video game company is developing a new augmented reality console that alters the brain to make the user see and hear objects that are not actually there. The technology has been created but is in the testing process

with an early prototype (Trachtenberg). Finally, in *The Matrix*, humans have created artificial intelligence robots that are able to think independently (Wachowski & Wachowski). These three innovations are at different stages of the development process, but all of them still have progress to be made.

All of these technologies have the potential to benefit society in some way. The procedure developed in *Flowers for Algernon* promises to completely change the life of Charlie Gordon, the protagonist. He is severely mentally retarded and has been abandoned by his family as a result of his disability. However, this procedure promises to change his life entirely. He writes in his journal that "If the operashun werks and I get smart mabye Ill be abel to find my mom and dad and sister and show them" (Keyes 12). However, the possible benefits don't stop with Charlie Gordon; this procedure could change countless lives for the better. The augmented reality of *Playtest* is not as impactful upon first inspection, but the innovation promises to change the way everyone plays video games and could also be used for practical applications such as training doctors or soldiers without putting anyone at risk (Trachtenberg). Artificial intelligence offers even more possible applications than augmented reality. It could eliminate human error in practically any field and make society drastically more efficient by eliminating the need for shifts or specific work hours (Wachowski & Wachowski). Unfortunately, while all three of these advancements were in development, scientists rushed the process and created an opportunity for a severely negative outcome.

Although all three scientific advancements are rushed, each innovation is rushed for a different reason and had a different cause for its eventual failure. Charlie's procedure is rushed by the lead scientist, Nemur, because he is striving for glory to please others. It is revealed that

Nemur reached his current position with help from his wife who had connections to the university where he now works and as a result, he feels extreme pressure to prove that he is worthy of his position (Keyes 152). Thus, he decides to accelerate human testing before adequate tests are made with further animals. While the procedure is initially successful, Charlie uses his new intelligence to discover a flaw in the procedure that makes the results only temporary. He attempts to find a solution but finds that "[...] the flaw is central and brings the entire [procedure] into question. Someday there might be a way to overcome this problem, but that time is not yet" (Keyes 257). The negative outcome in *Playtest* comes from a lack of essential precautions. The protagonist, Cooper, volunteers to test the prototype of the augmented reality system because he is desperate for money but the test goes wrong because of a lack of precautions in the testing environment. The system is extremely sensitive to interference during the set-up, and Cooper is allowed to bring his phone into the testing room where he gets a call during the set-up, causing a malfunction (Trachtenberg). In *The Matrix*, scientists failed to gather an in-depth enough understanding of artificial intelligence. They were successful in creating it but were not truly prepared to handle an autonomous system as they did not fully understand its implications. The scientists did not expect the system to be as smart as them and their lack of preparations and understanding resulted in the robots gaining the upper hand and ending up in a civil war with the humans who created them (Wachowski & Wachowski). Regardless of what exactly caused the negative outcome, these turning points were all brought on by carelessness from rushing to complete the innovation.

From these turning points, the stories reach their climax as the final negative consequences are revealed. Charlie Gordon eventually deteriorates to worse than he was before

the procedure and loses all the friends he made during his journey. His story ends with him stating that he is "[...] going someplace where they are a lot of other pepul like me and nobody cares that Charlie Gordon was once a genus and now he cant even reed a book or rite good" (Keyes 309). Rather than have an improved life and the chance to reconnect with his family, Charlie is forced to endure a slow decline into a state worse than how he was when he started. This outcome could have easily been recognized and possibly resolved had Nemur waited for the rat that was tested to first to live out its life to see the long-lasting effects before testing on humans. Unfortunately, his impatient urge to prove himself ruined what could have been a miraculous advancement. Cooper is killed by the augmented reality system after his phone call interferes with the set-up and causes the technology to essentially short-circuit his brain (Trachtenberg). This tragedy could have been easily avoided by the simple precaution of keeping his phone outside of the room but in an effort to create the new advancement as quickly as possible, the company did not take the time to establish adequate safety precautions. Finally, the most drastic consequence of rushing innovation is seen in *The Matrix*. The artificial intelligence robots begin to win the civil war against the human race and in a final desperate effort, the humans decide to create a nuclear winter to block out the sun which powers the solar-powered robots. Unfortunately, the robots were smart enough to create a way to harvest humans as an energy source and the robots won the civil war. Thus, humans are now farmed to power the robots and only a few humans live free and are in hiding (Wachowski & Wachowski). This entire apocalyptic outcome could have likely been avoided by scientists simply taking more time to ensure that they truly understood what exactly they were creating before they completed the process. Their desire to create without thinking carefully about the implications resulted in the

downfall of humanity. Unfortunately, these three works of science fiction do not portray a purely fictional threat.

While rushing does not always produce a negative outcome like those prevalent in science fiction, it does increase the probability of negative consequences. Humans increasingly crave instant gratification and rapid productivity as the world becomes accustomed to the internet and the opportunity to get almost anything instantly. As a result, scientists are also feeling increased pressure to be as productive as possible in their innovations. Industries realize moving too quickly can be a safety hazard and research has been done to determine how to best balance safety and productivity. A study of the aircraft manufacturing industry found that it is critical that safety and productivity be given relatively equal weight when making decisions in order to avoid catastrophe (Karanikas et al). Other industries, especially scientific advancement, must follow suit and balance safety and productivity to minimize the chance of a negative outcome like those of *Flowers for Algernon*, *Playtest*, and *The Matrix*. If action is not taken to counter the human desire to move faster, humanity risks ignoring the warnings of science fiction.

Conclusion

Science fiction provides a cautionary tale for how scientific advancements can negatively impact society if used incorrectly. These negative outcomes can vary from ruining the user's life to almost pushing the human race to extinction, but all the stories share a common thread: a specific scientific advancement is used improperly to the detriment of those around it. There are three main ways in which an advancement goes wrong. The first cause is when the advancement is overused and applied to too many situations. There is no formula for how much is too much, but in these stories, the technology is applied to almost every part of life even if there was not an original need for the technology in that aspect. As a result, there is a higher chance of it being corrupted for malicious purposes which eventually lead to a negative outcome. The second cause is excessive pride. When hubris interferes with a scientist's view of what is morally acceptable, there is an extremely high risk of the scientist pursuing an advancement that has positive potential but simply should not be attempted because of ethical boundaries. When these boundaries are overstepped, there is no limit to the negative consequences that can ensue. Finally, the third cause is rushing the process of scientific advancement. There are multiple ways in which a scientist could rush the process. The main three are a desire for fame clouding their judgment, failing to gather the appropriate knowledge before attempting the advancement, and not taking the necessary precautions to ensure safety in the process of innovating. *The Circle* by Dave Eggers, *Frankenstein* by Mary Shelley, and *Flowers for Algernon* by Daniel Keyes each demonstrate one of the three ways in which advancement can go wrong and provide cautionary tales for society.

In *The Circle*, the SeeChange cameras were an incredible invention that would allow for more transparency and equal access to resources and also push for meaningful change in areas that were secretive before the invention. The possibilities of this technology were limitless. Unfortunately, the limitless possibilities needed to have limits but none were put in place. As a result, the technology was severely overapplied until it was impossible for individuals who wanted privacy, like Mercer, to escape. This eventually leads to his suicide as he feels it is his only way out of the technology. After Mercer's death, the founder of the company finally realizes that the technology has gone too far, but it is too late to stop its application and the story ends with a depressing lack of reform. Had SeeChange been implemented with more moderation, the effects would likely have been drastically different as Mercer and others like him would not have felt trapped by the advancement.

In *Frankenstein*, Dr. Frankenstein is driven by a desire to learn how to create life in an attempt to bring the dead back to life so he can save his mother and others. Despite a well-intentioned motive, Frankenstein quickly becomes excessively prideful in his work as he begins to think of himself almost as a god. This hubris quickly blinds him from seeing the ethical issues with what he is doing and he oversteps the bounds of ethical science by trying to reverse nature. Thus, he is not prepared to face the creature he creates and turns it to a monster by rejecting it. The monster of his creation then kills everyone he loves and ruins the rest of Frankenstein's life. Had Dr. Frankenstein not allowed his pride to control his decisions, he would have realized the possible ethical issues with his advancement and been far less likely to continue with the project.

In *Flowers for Algernon*, the doctor rushes the process of creating a permanent treatment for mental retardation and corrupts the potentially incredible innovation as a result. Had he taken the time to fully ensure its effectiveness in the long term before a human test, Algernon would not have experienced above-average intelligence and normal life only to lose it all again. The doctor was pushed by a desire to gain recognition and allowed this selfish interest to interfere with the quality of his advancement. Thus, Algernon suffers and the treatment is substantially delayed if it ever becomes successful.

While these three stories and a large number of other science fiction stories portray science fiction in a negative light, some stories do show the other side of scientific advancement and how it can be incredibly beneficial in practice as well as in theory. A perfect example is *Iron Man*, directed by Jon Favreau. In this movie, Tony Stark, the protagonist, originally designs a mechanical suit of armor that is full of weapons to escape from being imprisoned by terrorists. However, he continues to improve the suit after he escapes and eventually uses it to save people around him and becomes a superhero (Favreau). This suit of armor had the potential to enable Tony Stark to do almost anything and be more powerful than the average person. However, he does not overuse this ability, he does not try to play God and control everything due to excessive pride, and he does not rush into it because the first half of the movie shows him working to develop the suit into something that is as effective as possible. Because Tony Stark avoids the three ways in which scientific advancement goes wrong, he is able to use his innovation to positively impact the world and save lives while also improving his own life.

Fortunately, outside of science fiction, scientific advancement more often has a result similar to *Iron Man* rather than like the other sources because scientists are careful to implement

practices that help them avoid the pitfalls shown in science fiction. Each of the main ways in which scientific advancement can be corrupted has a technique that can be used to avoid it. For overuse and overapplication, scientists are careful to not allow a technology to be used too much because they realize the importance of human touch and that there is a risk that technology will malfunction or have an error. Additionally, scientists are careful to use innovations in moderation so that they are only used when truly applicable and useful. For hubris, scientists are careful to follow ethical guidelines to avoid attempting something that should not be attempted such as creating a living being. These boundaries help discourage scientists from pursuing innovations for selfish reasons as that would be considered unethical. Finally, for rushing the process, companies and scientists alike are careful to balance productivity and safety so that both are given about equal consideration in the process. By ensuring that safety is maintained, scientists are forced to take the necessary precautions and do their research before beginning a potentially dangerous project.

These steps taken by scientists are typically extremely effective, but some advancements still end in negative consequences because the steps fail to prevent scientists from acting in dangerous ways. One of the most extreme examples is the nuclear bomb which fulfilled all three ways in which a scientific advancement could go wrong. The advancement was overused by being dropped a second time in Japan even after the destruction was seen during the first bomb. The advancement was created by scientists overstepping their bounds because they created something that could not be completely contained and was guaranteed to hurt innocent people as well as the targets. Finally, the nuclear bomb was rushed because scientists failed to effectively

prepare for the possible outcomes of using the bomb and did not foresee how it would create a global arms race to produce more nuclear bombs.

Fortunately, the vast majority of scientific advancements have positive impacts in the real world because scientists generally succeed in avoiding the dangerous actions shown in much of science fiction. Recently, scientists have developed a way for individuals who speak different languages to have real-time conversations due to real-time language translators that are "driven by voice recognition technology coupled with AI" (Forbes Technology Council). This advancement is allowing communication with ease that was never possible before. Additionally, scientists are using their growing knowledge of nuclear fission to create better nuclear reactors that are safer and produce more power to solve the developing energy crisis around the world as fossil fuels begin to become more scarce (Philips). These innovations have the potential to change the world for the better in drastic ways and while they are still new, scientists are rapidly making progress in those areas in addition to countless others. The majority of these projects will have positive outcomes due to the careful practices of scientists to avoid the tragedies so often shown in science fiction. It is important to remember that scientific advancement is neither inherently good or bad but is instead shaped by those who create it. Science fiction and its incredible advancements often offer a portrayal of the dangers society faces if scientific advancement is shaped incorrectly as it is in *The Circle*, *Frankenstein*, and *Flowers for Algernon*.

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Science fiction is sometimes abbreviated SF. In a 1960 survey of the field, New Maps of Hell, British novelist Kingsley Amis wrote that science fiction deals with events that could not happen in the world we know but are presented on the basis of some innovation in science or technology. Such works are most often concerned with the impact of these innovationsâ€"or of change in generalâ€"on humanity. Writers and readers generally agree that a work of science fiction should not violate what is known to science, even as it speculates widely and often wildly in areas outside the known. Although scienc... A summary about the characteristics of Science Fiction. A fun and engaging way to learn about the characteristics of this literary movement and what it all means!Â Science fiction, that's what. One thing we'll find over and over again in sci-fi is a setting that is strange, different, or faraway. Sci-fi writers are all about imagining an alternative world and bringing us readers to it.Â Advances in Science and Technology. The Scientific Revolution, which got going in the 16th century in Europe, had a huge (like, phenomenally large) impact on our understanding of the world. Scientists and mathematicians like Galileo and Isaac Newton made discoveries that continue to impact us to this day (heard of calculus? Yeah, we have Newton to thank for that). Definition & Examples. When & How to Use Science Fiction. Quiz. I. What is Science Fiction? Science fiction, often called â€œsci-fi,â€ is a genre of fiction literature whose content is imaginative, but based in science. It relies heavily on scientific facts, theories, and principles as support for its settings, characters, themes, and plot-lines, which is what makes it different from fantasy. So, while the storylines and elements of science fiction stories are imaginary, they are usually possible according to scienceâ€"or at least plausible. Although examples of science fiction can be found Though science fiction films have a history of criticizing technology, they themselves frequently depend on the most advanced technological innovations. Stanley Kubrick's (1928â€“1999) 2001: A Space Odyssey (1968), for example, presented a very sophisticated 3-D simulation of outer space and spacecrafts.Â With its spectacular visual celebration of scientific advancement, the film might initially appear to be pro-technology, but its villain is a murderous computer, HAL. Humankind's greatest technological achievement becomes its undoing, paralleling the earlier technological breakthrough, the bone, which was used by one ape to murder another.Â In science fiction films of the 1950s, alien attacks were often thinly veiled metaphors for Communist invasion. The following outline is provided as an overview of and topical guide to science fiction: Science fiction â€“ a genre of fiction dealing with the impact of imagined innovations in science or technology, often in a futuristic setting. or depicting space exploration. Exploring the consequences of such innovations is the traditional purpose of science fiction, making it a "literature of ideas".