Science in American Science Fiction: the subaltern that creates subalterns

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CULS 5212 Globalization and Politics of Representation

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May 4, 2020

Science fictions are reflections of humans' deep desires and fears about science and the anticipated futures that science may bring to us.[1] Science advancement in reality is also a factor that helps a people to relate themselves to their country.[2] This is because science advancement of a country provides aspirations of the future development of the country.[3] This hope unites the people.[4] Thus in both cases of reality and science fictions, science has great impact on people's aspirations of the future. Humans face moral decisions in how to make use of science and technology.[5] And in this process of decision-making, people reflect on the human relationship with science itself and question the meaning of humanity. [6]

Nevertheless, science itself is misrepresented in the popular culture. Science and scientific knowledge in sci-fi movies is sometimes not accurate.[7] This is because some directors may think that these details are not important for story telling.[8] For example, studies suggest that the classic train battle scene in Spider man 2 do not portray realistic 'falls' of the passengers.[9] In reality if the passengers are thrown out of the fast moving train as in the movie, they would at least suffer great physical damage, if they have not died instantly when they fall. The damage on the passengers' body from the fall would be very serious that they probably would not survive even spider man could 'catch' them with his web.[10] In fact in the comic, Spider man's girlfriend was killed in a similar fall even though she landed onto spider man's web just like the passengers did in the movie.[11] Thus the depictions of the actions in this particular scene do not comply the

[1] Carol E. Harrison, and Ann Johnson. " Introduction: Science and National Identity". *Osiris*, Vol. 24, No. 1, Science and National Identity (2009), pp. 1-14
http://www.jstor.org/stable/10.1086/605966 .
[2] Harrison and Johnson. " Introduction"
[3] Harrison and Johnson. " Introduction"
[4] Harrison and Johnson. " Introduction"
[5] Al, Horner. " Why Sam Raimi's Spider-Man 2 is the definitive superhero movie". *Independent*, July 16, 2019.
https://www.independent.co.uk/arts-entertainment/films/features/spiderman-2-best-superhero-movie-sam-raimi-tobey-maguire-marvel-a9001161.html
[6] Horner. " Why Sam Raimi's Spider-Man 2"
[7] Robert Moses Peaslee and Robert G. Weiner. Web-Spinning Heroics: Critical Essays on the History and Meaning of Spider-Man. (McFarland, 2014). 59
[8] Peaslee and Weiner. Web-Spinning Heroics. 59
[9] Peaslee and Weiner. Web-Spinning Heroics. 59
[10] Peaslee and Weiner. Web-Spinning Heroics. 59
[11] Peaslee and Weiner. Web-Spinning Heroics. 59

laws of physics.[12] This suggests that the passengers' survival in the battle scene is nearly 'impossible' and conveys inaccurate science knowledge to the audience.[13] This shows that the filmmakers did not consider the realistic portrayal of battle scenes but only tried to create dramatic and visually appealing scenes to impress audiences.[14] This attitude however, is criticized by the science sector.[15]

Therefore, in this essay we shall look into the representations of science and scientists in sci-fi movies. We shall make use of Spivak's theory of the subaltern in our discussion of the misrepresentation of various parties that we will cover. We shall discuss how scientists are misrepresented and silenced by sci-fi media productions. We will also look at how the misrepresentation of science has lead to further misrepresentation of women and ethic minorities. We then will briefly discuss how science is used for the construction of a national image. And in the process of such construction, we will see how science is again treated as a subaltern. Finally we will look at the possible changes brought by some recent sci-fi movies such as Black Panther. The discussion will make use of research and examples of sci-fi movies.

Firstly, the idea of the subaltern was proposed by Spivak in her essay "Can the subaltern speak?".[16] Her essay suggests that in the colonial era the colonized people were not able to speak for themselves.[17] This is because the colonizer has 'understood' these people through the lens of other sources such as academics, literature writers and politicians.[18] These sources represent the colonized people in their words and may have tried to voice out for them.[19] However, the words of academics and others sources may have consciously or unconsciously misrepresented these people for their own purposes.[20] For example, the academics may want to satisfy their own desire to criticize the colonial government and gain a sense of satisfaction

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12 Peaslee and Weiner. Web-Spinning Heroics. 59
13 Peaslee and Weiner. Web-Spinning Heroics. 59
14 Peaslee and Weiner. Web-Spinning Heroics. 59
15 Peaslee and Weiner. Web-Spinning Heroics. 59
16 Gayatri Chakravorty Spivak. 2008 "Can the Subaltern Speak?."
17 Spivak. "Can the Subaltern Speak?.
18 Spivak. "Can the Subaltern Speak?.
19 Spivak. "Can the Subaltern Speak?.
20 Spivak. "Can the Subaltern Speak?.

through the act of justice. Such desire may or may not be consciously noticed by the academic. The background of the writer or speaker may also have influenced the representation of the colonized people.21 Nevertheless, the subalterns' true opinions are covered by the voices of these people trying to represent them.22 The subalterns cannot be independent to speak for themselves and may always be a tool of these 'representatives' for their personal interests. Therefore, Spivak asked people, especially academics to be more aware of the language of representation.23 Spivak suggest that it may be best to let the subalterns speak for themselves. Because the representation of a subaltern through the lens of another person could never escape from biases or personal intentions. In this essay, instead of colonized people, the subalterns would be the science sector and scientists in sci-fi films.

To begin with, the representation of scientists is problematic in sci-fi films. According to Weigart and Hupparf, there are a few major types of scientist portrayals in the entertainment industry.24 However all portrayals are criticized as not accurate as they do not show the actual characters of real life scientists.25 In fact, many scientists claim that they are not very different from common people besides the fact that their research is more professional and specific. Their personalities may also be different from the stereotypes that are portrayed by the entertainment sectors. The private life and social interest of scientists are also not as limited as the media claims.

Nevertheless, because of the massive influence of the media, these stereotypes about scientists rooted into the minds of common people. For example, many may think that scientists are socially distant and 'mad'.26 They are highly focused in their research and would not care about others when they are doing research.27 Some scientists are also portrayed to value their

21 Spivak. "Can the Subaltern Speak?.
22 Spivak. "Can the Subaltern Speak?.
23 Spivak. "Can the Subaltern Speak?.
24 Peter Weingart, and Bernd, Huppauf. Science Images and Popular Images of the Sciences. (Routledge, 2012). 259
25 Weingart and Huppauf. Science Images. 259.
26 Weingart and Huppauf. Science Images. 259.
27 Weingart and Huppauf. Science Images. 259.

research as more important than their lives, and the lives of others.[28] Therefore these scientists appear to be lacking empathy and morals when they put too much emphasis on their projects. These stigmas about some scientists on screen rooted into the minds of people and extend to the whole science sector.

Therefore, the science sector may look distant to the public and people are reluctant to understand them.[29] This misunderstanding of scientists may have long-term implications. For example, people may become less interested in learning science and may have less faith in science research, which they do not understand.[30] However, the more people are reluctant to learn about science, the image of the science sector becomes more distant and hard to understand. This creates a vicious cycle that reinforces the negative stigma of science created by the media. And the science sector may become the subaltern who may never be able to voice out for proper representation.

Moreover, the vicious cycle not only affects science as a whole, it further damages the minorities in the science sector. Many scientists in sci-fi films are white males.[31] Therefore women and other minorities as scientists are underrepresented. It is true in the science sector that white men outnumbered women and other ethic minorities.[32] However, the portrayals of these minorities in sci-fi movies further worsen the situation of these minorities. In fact the representation of women and people of color in sci-fi media productions conforms to traditional gender and racial stereotypes.

For example, the women in science fiction can be divided in 2 major types, those who are scientists or have scientific backgrounds, or those who have little or no scientific background at all. Female characters who have little or no scientific background usually plays the role to

[28] Weingart and Huppauf. Science Images. 259.
[29] Martin W. Bauer, Rajesh Shukla, and Nick Allum. The Culture of Science: How the Public Relates to Science Across the Globe. (Routledge, 2012). 357.
[30] Bauer, Shukla, and Allum. The Culture of Science. 357.
[31] Weingart and Huppauf. Science Images. 259.
[32] Weingart and Huppauf. Science Images. 259.

compensate the 'weakness' of the male scientists.[33] The gender stereotypes of women to have higher emotional intelligence and sociability support the socially distant and 'nerdy' male scientists.[34] Some may even say the femininity these characters bring to the male scientists acts to "civilize" the scientists and "jeopardize male discipline and identity".[35] Thus because the stereotypes of scientists on the screen are nearly "social failures", they need sociable women characters to compensate their weakness.[36] Thus the women may act as the romantic partner of the male scientists and become their emotional shelter.[37] Some female characters on the other hand are 'caregivers' who take care of the male scientists who 'too busy' in their work to spare time to take care of themselves.[38] The female 'caregivers' may also help the socially distant male scientists to blend in to the society.[39] The female characters in this setting have reinforced both traditional female gender stereotypes and the negative stigmas of scientists. This makes both parties become subalterns that are misrepresented in the main steam culture and lose their chances for proper representation. The 2 parties also lose independence of their own and must rely on each other to demonstrate their character in this case.

Female scientists on the other hand, have controversial images. According to Flicker, there are a few types of female scientists.[40] They are mostly supporting roles and have less appearances comparing to their male counterparts in general.[41] Some female scientists such as the female scientists in the TV series CSI, are confident, intelligent and independent figures.[42] They are passionate and professional in their jobs. However, these women are "punished" for

[33] Lauren Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators: Film, TV, and Internet Stereotypes: Film, TV, and Internet Stereotypes. (ABC-CLIO, 2016). 47
[34] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 48
[35] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators: 48
[36] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 48
[37] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 47
[38] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 48
[39] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 48
[40] Flicker Eva. " Between Brains and Breasts—Women Scientists in Fiction Film: On the Marginalization and Sexualization of Scientific Competence". Public Understanding of Science 2003; 12; 307. DOI: 10.1177/0963662503123009
[41] Flicker. " Between Brains and Breasts"
[42] Expect Everything. n.d. " How Are Women In STEM Portrayed In The Media?". *Expect Everything*, n.d. http://www.expecteverything.eu/women-stem-portrayed-media/

doing the "men's work" in the lab and not conforming to traditional gender stereotypes.[43] Even in sci-fi movies, women are portrayed as characters that due with 'emotional' issues, while men due with the 'rational' issues.[44] Women should process feminine features such as the mentioned sociability and emotional intelligence.[45] And their physical appearance should also conform to the female gender images as a focus in front of the camera.[46] Therefore, the 6 types of female scientists suggested by Flicker proposes different 'punishments' for female scientists, in other words, different forms of inferiority. Alike Sara Sidle in CSI, some female scientists maybe professional and independent to their male counterparts.[47] However, they sacrifice their female features and sexual attractiveness and become alike male scientists.[48] For some whom may not have totally lost their female features, they would be socially inactive and obsessed with her work as the stigmatized male scientist.[49] Nevertheless, for this type of "old maid" scientists, she may lose her rationality and professionalism in front of romance.[50] Therefore for these scientists, they seem to be unable to balance rationality and femininity in their scientific career and have to choose one of them. Thus these female scientists could never be independent from the dominance of men. They could not represent themselves and express their scientific talent under the shadow of gender stereotypes.

Some female scientists on the other hand, are knowledgeable and passionate about her field of expertise.[51] She may not be as independent as the women above but would have their female features intact.[52] Thus they would 'need' a male 'mentor' to support and protect them in difficulties.[53] The role of these female scientists in the film would usually be an assistant of the

[43] Expect Everything. " How Are Women In STEM"
[44] Expect Everything. n.d. " How Are Women In STEM
[45] Rosewarne. Cyberbullies, Cyberactivists, Cyberpredators. 48
[46] Expect Everything. " How Are Women In STEM"
[47] Expect Everything. " How Are Women In STEM"
[48] Flicker. " Between Brains and Breasts"
[49] Flicker. " Between Brains and Breasts"
[50] Flicker. " Between Brains and Breasts"
[51] Flicker. " Between Brains and Breasts"
[52] Flicker. " Between Brains and Breasts"
[53] Flicker. " Between Brains and Breasts"

crew, or a romantic (and sometimes sexual) partner of the male main character.[54] Some female

scientists may even use their bodies to trick the male scientists to achieve their aims.[55] Flicker

suggests that these types of female scientists can associate to the image of science in the eyes of

the society. The conflicting "emotions" of "belief in the benefits of science" and "mistrust of

science research" in society can be seen in the roles of these female scientists.[56] Thus according

to Flicker, these types of female scientist contribute to the conflicting views about science in

society.[57] Nevertheless both the female scientists and science are portrayed as agents for human

masculine exploitation. Their representation depends on the gaze of men and again cannot be

independent to voice out for their own.

Furthermore, science fictions may base on virtual worlds and could be staged in the past,

present or future.[58] Nevertheless, the worlds in science fictions usually reflect current conflicts

in the real world.[59] One typical theme that occurs in science fictions is the oppositions of

humans and 'the other'.[60] 'The other' can be anything depending on the fiction's setting.

However, not only the opposition of humans and 'the other' in the fiction can reflect the

relationship between humans and products of technology, it can also indirectly reflect the

relationship between different human groups and races.

For instance science fictions such as The Planet of Apes may be read as the conflict between

humans and apes. However, some critics claimed that different apes maybe associated to

different human races in reality.[61] The social structure of the apes in the film can also reflect the

reality of racial inequality in our world.[62] The human survivors in the film are white. They are

however 'ranked' lower than the gorillas in the film, which are associated to the black

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[54] Flicker. " Between Brains and Breasts"
[55] Flicker. " Between Brains and Breasts"
[56] Flicker. " Between Brains and Breasts"
[57] Flicker. " Between Brains and Breasts"
[58] Adilifu Nama. Black Space: Imagining Race in Science Fiction Film. (University of Texas Press, 2010). 9
[59] Nama. Black Space. 8
[60] Nama. Black Space. 11
[61] Ulrike Küchler, Silja Maehl, and Graeme Stout. Alien Imaginations: Science Fiction and Tales of Transnationalism. (Bloomsbury Publishing USA, 2015).97
[62] Küchler, Maehl, and Stout. Alien Imaginations. 97

community in reality.[63] And thus the film allows the white community to have a taste of racial discrimination in the sci-fi world and hope to provoke reflections on racial inequality in the real world. In addition, in sci-fi films such as District 9, some critics suggest that the aliens, in other words the opposing species or party, would refer to other ethic minorities different from the white humans in the films.[64] And the white protagonist, Wikus, faces the horror in this film is the isolation from other humans and the sense of himself being "dehumanized".[65] Wikus's gradual transformation into 'the other' literally makes him less human. This made him become a subject for scientific investigation and key to access the technology of the aliens.[66] Therefore, in physical and social sense Wikus is dehumanized in the human society. At the end he could only survive in the alien form and live with the aliens. [67]

The fear of dehumanization is one core feature in science fictions.[68] As mentioned, in order to create this fear the theme that stages opposition between humans and 'the other' is needed.[69] This fear of dehumanization and following act of creation of opposition would be a direct reflection of racial discrimination in the real world. Science was used in the past to create 'evidence' that other races are more inferior and less intelligent.[70] Thus it is the DNA, the core formation of the specific race that makes them inferior comparing to the white race. This justified the racial discrimination and politics to control the colored races.[71] The whole process was to 'dehumanize' other races to justify white men's control over them.

Thus science seemed to be a privilege that could only be understood and used by the more 'intelligent' white race. However, science may be feared by the white race. The white race may fear that they, or humans in general, ultimately may not be able to control science and

[63] Küchler, Maehl, and Stout. Alien Imaginations. 97
[64] Küchler, Maehl, and Stout. Alien Imaginations.101
[65] *District 9*. Directed by Neill Blomkamp. (2009. Sony Pictures Releasing,) Film.
[66] *District 9*. Directed by Neill Blomkamp. (2009. Sony Pictures Releasing,) Film.
[67] *District 9*. Directed by Neill Blomkamp. (2009. Sony Pictures Releasing,) Film.
[68] Judith Kerman. Retrofitting Blade Runner: Issues in Ridley Scott's Blade Runner and Philip K. Dick's Do Androids Dream of Electric Sheep?. (Popular Press, 1991). 112.
[69] Nama. Black Space. 11
[70] Isiah Lavender. Race in American Science Fiction. (Indiana University Press, 2011). 44.
[71] Lavender. Race in American Science Fiction. 49

technology.[72] That science and technology may soon dehumanize all humans and control them.[73] On the other hand, the white race also fear that they will not be able to control other races one day.[74] Thus the 2 ideas were blended together in sci-fi films as a common topic of the opposition between humans and 'the other'.[75] The idea echoes with the situation in Spivak's essay. In Spivak's essay, the colonizers created or borrowed the negative representations of the colonized people so as to justify their rule over them.[76] And thus in the same sense, the subalterns in Spivak's essay and 'the other' of sci-fi films do not have the chance to properly represent themselves.[77] They become passive subjects that have no control on how dominating parties view them or treat them.

Nevertheless, the impact of race discrimination has already been established in both the science sector and the sci-fi films. The idea that colored races are not suitable for science careers shapes the extremely small numbers of colored people in the science sectors.[78] Colored people still face discrimination among scientists.[79] Colored casts in sci-fi movies are also limited.[80] Again representations of colored scientists are extremely rare in sci-fi movies.[81] Colored female scientists face even more discrimination and underrepresentation. Because they face both gender and racial discrimination in both sectors. As a result the vicious cycle of science in sci-fi productions occurs in a worse manner for ethical minorities and women. Science, which is already a subaltern in media representations, has worsen the situation of other subalterns.

The representation of science in sci-fi movies does not only affect the science sector,

[72] Kerman. Retrofitting Blade Runner. 111.
[73] Kerman. Retrofitting Blade Runner. 112
[74] Kerman. Retrofitting Blade Runner. 112
[75] Nama. Black Space. 11
[76] Spivak. "Can the Subaltern Speak?.
[77] Spivak. "Can the Subaltern Speak?.
[78] UNESCO. *Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM)*. (The United Nations Educational, Scientific, and Cultural Organization, 2017). 20.
[79] Elizabeth Ayana Johnson. " The Shuri Effect: A Generation of Black Scientists?". *Scientific American*, February 22, 2018. https://blogs.scientificamerican.com/voices/the-shuri-effect-a-generation-of-black-scientists/
[80] Clifford, Johnson. " 'Black Panther' and its science role models inspire more than just movie awards". The Conversation, February 8, 2018. https://theconversation.com/black-panther-and-its-science-role-models-inspire-more-than-just-movie-awards-112268
[81] Johnson. " 'Black Panther' and its science role models

women and ethic minorities. As mentioned science advancement can be a sign of the future of a country.[82] It can be a sign to unite the people and thus can be a vehicle for nationalism of a country.[83] For example, America has created many science fictions. Ideologies of the country are deeply rooted in American science fictions.[84] One branch of American science fictions is the world famous super hero films.[85] Super hero movies have a rich science basis because the science is necessary to grant super powers to the 'heroes'.[86] Science is the key factor to allow imagination to be possible in sci-fi movies and super hero movies, and thus is one of the core bases in these movies. Similar to other sci-fi movies, super hero movies usually involve a conflict between the main character and the power he/she gained from science.[87] The main difference between the villain and the hero in a super hero film may base on the attitude and use of the powers granted by science.[88] One main theme for super hero movies in Marvel would be the "responsibility" that follows the "power" of the hero.[89] The hero would face an identity crisis when he/she has to face this "responsibility", as their lives with and without the superhero costume maybe very different. This is another reason for putting super hero movies into the sci-fi category.

Heroes in super hero movies would also frequently face conflicts with 'the other'. Besides the villains they confront, the procession of the scientific power may make super heroes become 'the other' to the common people. Just as the nature of science in sci-fi movies mentioned above, the heroes with strong powers are both a 'grace' and 'threat' to human survival.[90] If the power is

[82] Harrison and Johnson. " Introduction"
[83] Harrison and Johnson. " Introduction"

[84] Lydia Dubois, "Superheroes and "the American way" : popular culture, national identity, and American notions

of heroism and leadership". (University of Richmond, 2019). https://scholarship.richmond.edu/honors-theses/1380

[85] Simon Locke. Re-crafting Rationalization: Enchanted Science and Mundane Mysteries, (Routledge, 2016). 105
[86] Adam, Frank. " 'Black Panther': Science, Heroes — And How Comics Changed The World". *National Public Radio*, February 16, 2018.
https://www.npr.org/sections/13.7/2018/02/16/586544153/black-panther-science-heroes-and-how-comics-changed-the-world
[87] Dubois, "Superheroes and "the American way""
[88] Horner. " Why Sam Raimi's Spider-Man 2"
[89] Dubois, "Superheroes and "the American way""
[90] Lincoln Geraghty. American Science Fiction Film and Television. (Berg, 2009).

taken in wrong hands, the heroes may not be very different from the aliens and villains they fight with. The film Captain America: Civil war directly tackles this problem. The heroes in this film are requested by the UN to summit their independence and work for the UN for the good of humans.[91] They would be required to retire as a super hero if they reject the offer.[92] The heroes are thus forced to face the damage they have brought to other common people during their battles with their opposing parties.[93] They realize that the existence of super heroes is not seen as a total grace to all, but may also viewed as a threat.[94]

Nevertheless, even though their battles with great forces like the alien in the Avengers may aim to save all humans, critics suggest that the super heroes were still based in the US.[95] They focused in rescuing American cities and indirectly saved all humans by winning the battles in these cities.[96] Thus the heroes were still a 'property' of America. However, when a hero decide to take the offer of the UN in Civil war, he/she becomes the 'property' of the world and would have even less independence in his/her private life without the super hero costume.[97] This directly challenges the sense of identity as a super hero in each character.[98] This also questions how the characters perceive their power that is granted by science.[99] The highly political plot circles around the moral use of science, and extends to the choice of keeping the power of science of the good of the individual, one's country or the whole mankind.[100] This again shows the 'otherness' of super heroes as products of science. It may be said the fact that the heroes have the choice to decide how they use their powers may suggest more independence and power for the science sector to speak for themselves and make their own decisions. However, as the film

[91] Dubois, "Superheroes and "the American way""
[92] Dubois, "Superheroes and "the American way""
[93] Dubois, "Superheroes and "the American way""
[94] Dubois, "Superheroes and "the American way""
[95] Dubois, "Superheroes and "the American way""
[96] Dubois, "Superheroes and "the American way""
[97] Dubois, "Superheroes and "the American way""
[98] Dubois, "Superheroes and "the American way""
[99] Dubois, "Superheroes and "the American way""
[100] Dubois, "Superheroes and "the American way""

later reveals, the heroes that refuse the control of the UN would be regarded as 'criminals'.[101]

Therefore, even though the heroes have the freedom to choose their future, they would finally

either be viewed as 'scientific tools' of the UN or 'criminals' that is feared by many.

This reflects the reality of science and technology. The science sector may have little control

on how people view their works. They may be 'heroes' that do good to humans. However, the

science sector is viewed as a distant subject that could either be a powerful tool or a fearful

threat.[102] Thus in the Civil War science is portrayed in the form of the super heroes that could

only be accepted by humans as a tool or doomed as threat. Science is never truly independent on

its own nor can voice out for itself. In addition, as demonstrated in the case of the Civil War,

science thus is a vehicle for political promotion of a strong national image. This acts to boost

nationalism in the people. However, the actual voice of the vehicle itself is not a matter of

concern. It only matters when the number of people joining the science sector is decreasing. This

is because this may affect the technological advancement of the country and finally the strong

national image of America. Therefore science becomes the subaltern that is passive in its

representation and use as a political tool.

The American society had noticed a fall in people pursuing scientific careers.[103] Therefore,

the White House had launched a fact sheet demanding for more accurate representations of

professionals working in STEM sectors.[104] The fact sheet asks for 3 goals from the

entertainment media: "1) include diverse STEM role models, 2) highlight the breath of STEM

careers and societal impacts of STEM work, 3) clarify STEM stigmas and misconceptions".[105]

This would have been a great act to tackle the stereotypes of the science sector mentioned above.

In fact, recent sci-fi movies have been trying to achieve these aims. Take the famous blockbuster

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[101] Dubois, "Superheroes and "the American way""
[102] Geraghty. American Science Fiction Film and Television.
[103] Alicen, Ricard and Vanessa, Reich-Shackelford. " Depictions of Women in STEM: Shuri, Black Panther".
Westcoast Women in Engineering Science ad Technology , February 5, 2019.
https://www.sfu.ca/wwest/WWEST_blog/depictions-of-women-in-stem--shuri--black-panther.html
[104] Ricard and Reich-Shackelford. " Depictions of Women in STEM"
[105] Ricard and Reich-Shackelford. " Depictions of Women in STEM"

Black Panther as an example.

Black panther is praised for the positive representation of the African black minority and women in the science sector.[106] One character, Shuri, especially appeals to many people working in STEM professions. Shuri demonstrates her intelligence and great scientific talents in the movie.[107] She is clear about her identity and abilities and is confident in pursuing herself.[108] Shuri has mastered the application of vibranium, a fictional metal that can only be found in Wakanda.[109] And she has successfully applied the use in the designs her brother's super hero costume and the operation of Wankanda.[110] At the end of the film, Shuri is in charge of the science and information exchange at the Wakandan International Outreach Center, which is established by her brother.[111] Therefore Shuri is a positive image of a colored woman that can achieve great success in STEM careers. Critics believe that the character may stir up a "Shuri effect" that allows colored young girls to challenge the stereotypes of science and pursue STEM careers.[112] This is because critics believe that the 16-years-old black scientist would be a concrete model for colored girls to 'see' themselves as scientists 'like Shuri'.[113] Besides Shuri, T'Challa, the Black Panther is also a talented scientist and athlete.[114] Although his scientific talents become less obvious in front of Shuri, T'Challa tackles stereotypes of black talent on science.[115] T'Challa may also broken the stereotype that science and sports are opposing characteristics that cannot exist together in a person.[116] This is a common stereotype that is portrayed in comics. Scientists are rarely seen as sporty while athletes are seldom related to

106 Johnson. " 'Black Panther' and its science role models
107 Ricard and Reich-Shackelford. " Depictions of Women in STEM"
108 Ricard and Reich-Shackelford. " Depictions of Women in STEM"
109 Ricard and Reich-Shackelford. " Depictions of Women in STEM"
110 Ricard and Reich-Shackelford. " Depictions of Women in STEM"
111 Ricard and Reich-Shackelford. " Depictions of Women in STEM"
112 Johnson. " The Shuri Effect".
113 ShareAmerica. " Black Panther shatters stereotypes and promotes science". ShareAmerica, March 16, 2018. https://share.america.gov/black-panther-shatters-stereotypes-box-office-records/
114 Johnson. " 'Black Panther' and its science role models"
115 Johnson. " 'Black Panther' and its science role models"
116 Barbara F. Tobolowsky, and Pauline J. Reynolds, Anti-Intellectual Representations of American Colleges and Universities: Fictional Higher Education. (Springer, 2017), 42

science in comics.[117]

In addition, Black Panther is a ground breaking sci-fi movie because its casts and scriptwriters are formed with a nearly all black crew.[118] The character Black Panther was originally created by white writers as a character that black audiences could relate to.[119] He was a guest character that was looked down by some white characters in the first place.[120] However, the white characters were amazed by the technological advancement of Wakanda, which looked like a common African tribe on the surface.[121] This is another example of how scientific advancements may impact how people imagine the power of a country. The white characters only showed respect to Wakanda when they saw its technological advancement. Nevertheless, the film Black Panther provides a new perspective on the character. Black Panther is no longer the black hero that serves other white heroes, his story took the perspective of the black community that is independent from the gaze of the white men.

The story addresses black racial issues in the lens of the black people.[122] This is what makes the scientific advancement of Wakanda portrayed in this American sci-fi film relatable to the African black community. This thus makes the African black community proud of the scientific advancement of Wakanda and can relate themselves to the hero scientists.[123] Some critics suggested that Black Panther's fictional country Wakanda may be able to remind audiences of the technological advancement of Africa that was covered by the colonial insight.[124]

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[117] Tobolowsky and Reynolds, Anti-Intellectual Representations"

[118] Johnson. " 'Black Panther' and its science role models"

[119] Mackenna, Cummings. n.d." Black Panther: Movie To Movement". *STEAM Magazine,* n.d.

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[120] Johnson. " 'Black Panther' and its science role models"

[121] Johnson. " 'Black Panther' and its science role models"

[122] Frank. " 'Black Panther': Science, Heroes"

[123] Frank. " 'Black Panther': Science, Heroes"

[124] Droney, Damien. What Can Marvel's Black Panther Tell Viewers about Science and Technology in Africa?, February 21, 2018. Formations, The University of Chicago.

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On the other hand, Black Panther could provide insights to the audience on the future development of Africa in terms of scientific advancement.[125] This may also act to unify the African black community. This may allow more people in looking at Africa in positive light. Black Panther therefore sets an example on how new sci-fi movies may change the stereotypes of African black people and their potential in pursuing STEM careers. The movie may also change the images of nations in Africa in terms of scientific advancement.

The movie as a whole provides a chance for the subalterns of science, including scientists, women and the black community, to speak out for themselves. And given the influence of Marvel Studios in the globe, the impacts of the movie would be global.[126] This hopefully raises awareness on the problems of science representation in sci-fi movies and how the problem can be solved to ensure the voices of subalterns can be heard independently. This is because it is important to let diversity grow in the science sector to stimulate more innovations, enhance research performance, and to ensure that talent would not be covered by the impacts of misrepresentations of subalterns.[127]

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