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How Perpetuated Stereotypes Affect the STEM Field for Women: An Exploration through 21st Century Films

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ABSTRACT

As more members of the 21st century society become increasingly supportive of equal rights for both sexes, the film industry is striving to produce more stereotype-breaking representations of women. One of the many ways filmmakers attempt to achieve this goal is by producing movies related to the women in STEM fields. While the intention behind these films may be to raise awareness for the importance of breaking female stereotypes, it can achieve the opposite effect on the film audiences. This paper aims to look at the effects *The Imitation Game's* and *Don't Look Up's* portrayal of female characters in STEM. To do this, the two movies are analyzed with a literature review and application of theoretical framework on specific scenes within the two movies. The conclusion that this paper reached is that both *The Imitation Game's* and *Don't Look Up's* portrayal of female characters in STEM fields encourage the perpetuation of unrealistic stereotypes that mislead younger generations of girls when pursuing careers in STEM fields.

Keywords: Female Stereotypes, STEM fields, Hysteria, Scopophilia.

JEL Classification: Z1; Z11.

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1. Introduction

Not many women I know work in STEM fields. Most of my friends and family, like me, are interested in or work in literature, film studies, history fields — ones that society typically expects women to be in. As a result, almost all my impressions of women working in STEM fields are shaped by the TV shows and movies I watch. Some of the earliest shows and movies, I've watched associate female characters with aloof or pragmatic personality traits since their work requires them to be constantly logical, efficient, and decisive. Despite the little positive connotations some of these personality traits have, they can also suggest that women working in STEM lack positive traits such as emotional intelligence that makes them approachable or empathetic. When popular TV shows or

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movies continue to portray characters in STEM with pragmatic and aloof personality traits, a stereotype arises, narrowing the audience's perceptions of real women in STEM. Most recently I watched two films that involve the portrayal of both male and female characters working in STEM fields, *The Imitation Game*, and *Don't Look Up*. What fascinated me was how differently both films portrayed male and female characters in STEM. Specifically, why the films depict female characters as acting more excessively emotional and engaging more of their conversation about finding romantic partners. This imbalanced portrayal of women in STEM encourages negative stereotypes that potentially threaten women's success in their careers. This paper will focus on studying how *The Imitation Game* (Morten Tyldum, 2014), and *Don't Look Up's* (Adam McKay, 2021) portrayal of female characters searching for romantic partners and acting excessively emotional detract from the films' representations of women working in STEM fields. To answer this question, I argue that the portrayal of female scientists searching for romantic partners and acting excessively emotional in these films bolsters stereotypes of women in STEM that represent women as hysterics and outsiders.

Don't Look Up is a 2021 political dark satire comedy film about two astronomers, Kate Dibiaski and Dr. Randall Mindy, on a media journey to warn the public of a planet-destroying comet. The film is a clever and brash satire about America being so consumed with celebrity worship, social media popularity and political rivalry that the public refuses to take the impending destruction of the planet seriously. Although never mentioned in the film, the parallel between climate change and the comet is obvious since both are impending threats that some of the public refuse to acknowledge. When Kate and Dr. Mindy first take their discovery to the news, the public only focuses on Kate's emotional breakdown and Dr.

Mindy's attractiveness, explicitly pointing out the double-standards that our current society hold towards men and women. Despite the two astronomers' efforts to prevent this disaster, government officials have no successful solutions, and even attempt to silence the truth. In the end, the comet destroys all life on earth.

The Imitation Game is a 2014 American historical drama film based on the 1983 biography *Alan Turing: The Enigma* by Andrew Hodges. During the second world war, Alan Turing served as one of the codebreakers of the Enigma, a machine developed by the Nazis to communicate using coded messages. With the help of Joan Clarke, a Cambridge graduate Alan recruited into his team of codebreakers, Alan invents a machine named Christopher, which later helped to break the Enigma messages instantly on a daily basis. Alan committed suicide after the war due to chemical castration forced upon him by laws against homosexual men.

It is worth recognizing that both films criticize the double standards and discriminations that women encountered both currently and in the past. However, this criticism is not apparent enough throughout all scenes involving female protagonists, sending a conflicting message while the two movies are of different genres, the *Imitation Game* being based on a true story, and *Don't Look Up* being a dark satirical comedy, they still both contain negative and misleading representations of women in STEM fields. Unpacking the methods in which *Don't Look Up* and *The Imitation Game* represent women as hysterics and outsiders reveal how these negative representations thwart women's success in STEM fields. Specifically, this paper will examine the reactions of surrounding characters who refer to female character/s as "crazy" or "overreacting", camera shots that dramatize female characters' reactions or personalities, and the frequency female characters engage in conversations about "boy problems", or relationship related issues.

How other characters react to female characters in films or TV shows play a major role in partially forming the audience's attitude or impressions of those female characters. If a group of supporting characters are calling a female character crazy, the audience of the film is likely to empathize with the majority and form a bad impression of the female character. Similarly, when female characters engage more of their conversations about marriage and relationship problems compared to male characters, the audience form the impression that women lack individuality. The two films' portrayal of female characters in STEM fields reinforces stereotypes insinuating that women are inferior to men in terms of intelligence, emotional stability, or independence. These stereotypes influence spectators' perceptions of women in STEM fields through biased representations in films, causing women to under-perform in their respective career paths. This paper seeks to investigate how these

stereotypes are portrayed and how they affect women's careers and is divided into 6 sections: (1) Introduction, (2) Literature Review, (3) The Female "Hysteria", (4) Manipulation of Camera Angles, (5) The Excessive Discussion of Romance and Conflicts, and (6) Conclusion.

2. Literature review / Theoretic frameworks

Maya Deren's "Cinematography: The Creative Use of Reality" (2009) analyzes how artists convey a personalized reality through photography and films. Deren explains that the camera is not inherently creative. When artists use the camera to create photographs or motion pictures, the artist instills creativity into the camera. Camera angles can emphasize particular details or present a novel perspective of the reality represented. However, Deren also argues that the degree to which an artist may modify the photographic process is limited. The point where the artist can no longer be the modifier is when the original reality "becomes unrecognizable or irrelevant" (Deren 68). In this case, the camera will be conceived as the artist, using distorting lenses, or various angles to stimulate the creative images that capture the eye and memory. Deren explains that an important part of the creative process of filming is the manipulation of time and space. This manipulation consists mainly of the extension of time in these elements. Deren gives an example of a character ascending a stairway; to achieve the extension of space within this scene, the creator may film "from different angles so that the identical area is being covered each time" and "edited together so that the action is continuous" (Deren 70). By reprinting a single frame, artists create the effect of "freezing the figure in mid-action," thus achieving the extension of time. Creating an illusion of extended time can convey a sense of critical hesitation when applied to certain characters. By inter-cutting reprints of character movements, expressions, and exchanges, artists can shift emphasis from one movement to another. Using these techniques, film directors can be selective in emphasizing the movements or reactions of female characters. The most prominent example being overly sexualizing female character by concentration camera shots on their hands, hair, or back, etc. Similarly, Laura Mulvey's "Visual Pleasure & Narrative Cinema" (1975) also examines how the camera becomes the mechanism for producing the illusion of space. Mulvey suggests that when used on a specific type of character, different types of angle shots can create alternate impressions of that character using techniques such as extreme long shots to diminish a character's status or power, etc.

The central topic of Mulvey's article analyzes how films portray female characters as passive objects where she examines the scopophilic instinct—the pleasure in looking at another person, specifically a woman, as an erotic object. The term can be interpreted as the love of looking, referring to the predominantly male gaze of Hollywood cinema, often objectifying women as mere objects to be looked at (rather than subjects with their own voice and character). The main goal of objectifying female characters is to satisfy visual and erotic pleasure in mainstream films. Mulvey contends that the development of the scopophilic instinct in mainstream films stems from a "primordial wish for pleasurable looking" (Mulvey 807). Mulvey explains that women in cinema often play an exhibitionist role, while simultaneously being looked at and displayed "with their appearance coded for strong visual and erotic impact...to connote to-be-looked-at-ness" (Mulvey 809). Furthermore, a woman's visual presence in a film tends to work against the development of a storyline because it freezes the flow of action in moments of erotic contemplation for the audience. As Mulvey quotes from Budd Boettcher, "what counts is what the heroine provokes...in herself the woman has not the slightest importance" (Mulvey 809). Using a psychoanalysis approach, Mulvey suggests that the ultimate meaning of women is sexual difference, meaning her lack of a penis. The absence of this male genital implies "a threat of castration and hence unpleasantness" (Mulvey 811). To deal with this castration anxiety, as Mulvey terms it, men build up fetishistic scopophilia: seeing the physical beauty of the object, and transforming it into something satisfying in itself.

The scopophilic instinct can also impact children. Mulvey refers to the mirror phase — when a child recognizes their own image in the mirror that constitutes their ego. Mulvey explains that the mirror phase occurs "at a time when a child's physical ambitions outstrip his motor capacity", resulting in the imagination of a more ideal experience in their body. This effect can lead to narcissism in children by misrecognizing themselves.

Finally, Chris Rob e's "Taking Hollywood back: The Costume Drama, Women, and the Spectacle" (2009) studies the distinction between historical costume drama and "legitimate" historical films.

According to Robé, a good historical film should embody the thematic conception of the film, operating as a metaphor rather than engrossing the audience with empty surface details, ultimately distracting them from a film's main theme. Robé discusses how traditional gender hierarchies are incorporated into films, punishing strong women in the name of more important causes. The author's analysis of the film *La Marseillaise* provides an example of a film that counteracts the historical costume drama's dependence upon a system that individuated historical events. Rather, *La Marseillaise* depicts the characters of historical events operating on a collective and individual level. The film shows characters as human beings with a life and reasons for fighting in these political revolutions instead of participating as irrational mobs blindly revolting against their governments. Finally, Robé analyzes how Left film critics tend to encourage male-centered genres and styles. Discussing the impact of gender hierarchies in contemporary films are important because it expands the perspectives of the audience to understand the evolution of gender stereotypes, and encourages them to form their opinions about how to address gender hierarchies within contemporary society. It is important to note, however, that all of these literatures were written 2-5 decades ago, so their analysis may be outdated when applied to contemporary films such as *Don't Look Up* and *The Imitation Game*. Robé's discussion regarding *La Marseillaise*, for example, is potentially outdated because the film was produced in 1938, nearly a century apart from the two films analyzed in this paper.

3. Methodology

This paper uses the method of thematic coding to conduct in depth film analysis including camera angle choices, language in character dialogue, and character interactions within specific scenes, etc. The first step of conducting thematic coding is to identify a common theme between the *Imitation Game* and *Don't Look Up*. In the context of this paper, the major theme will be focused on female stereotypes. In combination with previous literature review analysis regarding the causes and impacts of perpetuating female character stereotypes, I watch both films 2-3 times and note down scenes where the female stereotype theme is present.

4. The female "Hysteria"

The oldest record of "hysteria" associated negatively with women dates back to 1900 B.C., when "Egyptians recorded behavioral abnormalities in adult women on medical papyrus." The word hysteria originates from the Greek word for uterus, *hystera*, which suggests that societies have been confining women in the stereotype of being crazy and monster-like for centuries. Feminist social historians argue that the main cause of "hysteria" is "women's oppressed social roles, rather than by their bodies or psyches, and they have sought its sources in cultural myths of femininity and in male domination." (Gilman Sander L, *Hysteria Beyond Freud*)

The dialogue used to portray male and female characters often suggest that only men can communicate effectively and are authoritative voices as scientists. In *Don't Look Up*, Kate Dibiasky expresses disbelief at the president's decision to "sit tight" and not say anything about the incoming comet. The president's son insults her by rudely asking who she is, to which Kate retorts with the same attitude. Dr. Mindy tries to calm the tense situation by reformulating Kate's response beginning with, "I think what miss Dibiasky is trying to say is." Dr. Mindy's rephrasing of Kate's words portrays Kate as a woman incapable of controlling her emotions, who needs a rational man to save her in a stressful situation.

Whereas Kate is seen as his subordinate lacking communication skills, Dr. Mindy is portrayed as the authoritative leader of the comet project possessing leadership skills and control in making decisions in major events. When Kate and Dr. Mindy are invited to speak about the comet on the news, Kate makes an angry outburst at the two show hosts' apparent obliviousness to the severity of the comet, while Dr. Mindy only makes a few terse comments. After the show, the internet exploded with comments mocking Kate's angry breakdown but praising Dr. Mindy as "the sexiest astronomer alive." These scenes suggest that female scientists are not capable of handling emotional pressure within their fields. These films rely on stereotypes representing women as emotionally unstable by including more scenes of emotional breakdowns experienced by female scientists than by male scientists. In *The Imitation Game*, Joan tells Alan that she is going to leave Bletchley according to her parents' wishes.

This news upsets Alan, prompting him to say that this is an opportunity for Joan to “make some actual use” of her life. Joan is offended and retorts by calling Alan, a “fragile narcissist.” Both Joan and Alan soon realize that they went too far with their words. While Joan looks frightened and apologizes immediately, Alan switches to another topic without commenting on his hurtful words towards Joan. By presenting female characters as those having to apologize for their emotions, the scene implies that reacting with negative emotions is a bad quality. A stereotype is then formed when this “bad quality” is associated with female characters like Joan. Therefore, the film confines women in a stereotype of lashing out irrationally when arguing with men, who are portrayed as calm and in control.

Male scientists often show signs of exasperation or annoyance at female scientists’ views or actions thereby portraying male scientists the rational leaders of the project. In *The Imitation Game*, Joan enters the testing room for a potential job. She is stopped by the male receptionist near the door and told to go to the secretary’s office upstairs despite having the official letter of invitation. The receptionist takes on a demeaning tone as he informs Joan that she must be mistaken, and that women are not allowed in the room. The man also questioned whether she “really did solve the puzzle by herself,” speaking down to Joan like an immature child. As Joan desperately argues with the receptionist, most male candidates turn to look at her as if she were an annoying interruption. Similarly, a scene in *Don’t Look Up* portrays Dr. Mindy and Dr. Oglethorpe displaying actions such as rolling their eyes or sighing loudly at Kate’s actions. After overhearing the three scientists’ discussion the fate of the comet projects, strangers at the bar come up to the main characters and demand the truth. Dr. Mindy and Dr. Oglethorpe reluctantly deny any knowledge of the situation, but Kate was determined to warn the people. She stands up and yells about how Peter and the President desire wealth more than the safety of the citizens. Immediately, Dr. Mindy sighs exasperatedly, and Dr. Oglethorpe, head bent with embarrassment, covers his face with his palm. By giving male characters the power to demean female characters’ actions, these scenes portray female characters as impulsive and unreasonable.

In these films, female characters are punished for expressing emotions implying that they require male scientists to lead them. In *Don’t Look Up*, Kate suddenly laughs at the ridiculousness of the president and Peter’s actions. Dr. Mindy gets offended and asks her why she was laughing, pointing out Kate’s inappropriate expression of her emotions. The same act of suppressing Kate’s emotions occurs in the following scene. Deprived of the president’s support of acting on the comet immediately, Kate and Dr. Mindy argue about how to salvage the situation. Enraged when Dr. Mindy questioned her about who she deems to be the right candidate to lead in solving the issue of the comet, Kate made an emotional outburst, pounding her fist on the table.

Dr. Mindy shushes her to silence her opinions. It is common to see a man silence a woman in films and literature, the act diminishes the woman’s power to speak her mind, thus restricting her expression of intelligence or emotions. Perhaps one of the oldest representations of silencing women come from Homer’s *Odyssey*. That act starts in the first book of the poem when Penelope (Odysseus’ wife) descends from her private quarters into the great hall of the palace, to find a bard performing a sad recital to throngs of her suitors. Annoyed, she asks Telemachus (Penelope and Odysseus’ son) in front of everyone to choose a happier recital. Telemachus then orders his mother to be quiet and go back to her sewing work, asserting his dominance as the master of the household. Similarly, instead of having any regard to the genuine concern behind Kate’s outburst, Dr. Mindy chose to silence her opinion at once in fear of causing a scene at the bar. The act of restricting Kate’s right to express her emotions and concerns suggests that women are constantly out of control of their emotions, classifying them as “hysterics” that need men’s power to contain their madness. A power dynamic then emerges where Kate is a “hysterical” subordinate who is forced to listen to her leader. The suppression of angry outbursts in these scenes suggest that expressing emotions impede the team’s progress to find a solution and should therefore be punished. In both scenes the male character judges the female character for their outbursts of emotions, treating it as immature and inappropriate behavior. The frequency of male characters attempting to control or punish female characters for their emotions suggest that ultimately, men have dominance over women by containing women’s hysterical outbursts.

5. Manipulation of camera angles

The use of close-up shots to emphasize female characters’ facial expressions in these films dramatize women’s reactions in stressful situations, implying that women tend to overreact and are

incapable of handling pressure. Many scenes in *Don't Look Up* utilize extreme close-up shots of Kate's face when she experiences emotional breakdowns or is facing immense pressure. Kate's outburst on the news that goes viral for example, consists of close-up shots that emphasize Kate's changes in facial features. A frown in the eyebrows, or a twitch of the corner of her lips, all of which indicates her subtle changes in emotions. When both TV hosts attempt to lighten the topic of the deadly comet, several shaky zoom-in shots of Kate's side profile cuts in while the background voices of the show hosts dim, foreshadowing the accumulation of Kate's frustration. As the TV hosts make jokes about the comet, Kate loses control of her anger and says that everyone is going to die. While the portrayal of Dr. Mindy in this scene only involves medium shots of his upper body, these intermittent extreme close-up shots of Kate's face dramatize her reaction in a high-pressure situation. The utilization of extreme close-up shots of female Kate in *Don't Look Up* accentuates that they cope poorly with pressure compared to male scientists. The use of high-angle shots of male characters looking down on female characters create an invisible gender hierarchy, suggesting that women are inferior to men. In the Imitation game, Joan is filmed looking up at the receptionist explaining that she was "only a few minutes late." When the shot switches to the reception man responding to Joan, the scene uses a high angle shot to emphasize the man's higher status as he told Joan to leave. The male receptionist takes a condescending tone by assuming that Joan is there for a secretary position (a predominantly female job) instead of the actual code-breaking position. He even smiles at

Joan's stuttering and attempts to defend herself. As their dialogue progresses, the camera continues at slightly higher angles to present the male receptionist at a higher advantage. The high angle also highlights the male character's dominance creates a gender hierarchy where the female character is at a lower status. Among humans, there is evidence to suggest that height is related to physical dominance. Taller compared to shorter men are perceived to be "stronger, physically more aggressive, and show better fighting ability." (Abraham P. Buunk, Simon Verhulst, Thomas V. Pollet) As a result, taller individuals, particularly taller men, have higher levels of self-esteem than shorter individuals, typically women. Thus, men are more likely to display more self-confidence in social interactions and see themselves as leaders to women. When taller men automatically take authority over women by physically looking down on them, women obtain the weaker, powerless status that is ranked below men within the gender hierarchy. The high angle camera angle in *The Imitation Game* achieves exactly this effect. Despite playing a significantly larger role in the movie, Joan looks smaller and weaker than she is because when the camera is placed slightly higher from the male receptionist's point of view, creating a dominant position that contrasts Joan's "weaker" status.

6. Manipulation of camera angles and visual portrayals

The public in *Don't Look Up* dehumanizes women by circulating images that the public transforms to mock the female protagonist. Despite Kate's repeated efforts to emphasize the severity of the incoming comet, the public on the internet view Kate as the "Crazy lady." As the mocking caricatures of Kate having an emotional breakdown become increasingly offensive, the images go viral on the internet. Some caricatures consist of distorting Kate's face into Pinocchio's or memes comparing Kate to serial killers. By manipulating Kate's image, the public takes pleasure in attacking a single individual that they deem a villain. The manipulation of Kate's image on the internet rejects her identity as a human being, rather portraying her as an object of pleasure for the public. Compared to Dr.

Mindy, comments surrounding him are mostly positive and complimentary of his looks. Users on twitter name him "the bedroom eyes doomsday prophet", and think that "Mindy is hotter than the sun", etc. Referring to Mulvey's argument in her paper, Kate is an example of being treated as a popular subject of mockery on the internet, which diminishes her human trait of being emotionally overwhelmed.

Certain camera shots sexualize female characters, presenting them as objects rather than human beings. A scene in *The Imitation Game* depicts Joan and her friend sitting at a table looking at Alan, Hugh, John, and Peter from afar. While Joan and her friend Helen engage in conversation, several camera shots focus on the two women's upper body, focusing on their giggling facial expressions and hands as they flick their hair. As Joan's friend and Hugh continue to exchange flirtatious glances, Hugh comments to Alan and the others that, "there's nothing like a friend's engagement to make a woman

want to do something she'll later regret with the fiancé's better-looking chap." Another shot then cuts to Helen smiling flirtatiously back at Hugh. Not only did Hugh refer to Helen as a predictable object that serves his own pleasure, the camera shots depicting this interaction emphasize on Helen's body and facial movements, confining her as a source of pleasure for men.

7. The excessive discussion of romantic relationship and conflicts

Revealing a heteronormative imperative to find romantic partners, the tension between work and romantic relationships is stronger for female characters than for male characters in these films. In *The Imitation Game*, Joan faces pressure from her parents that prevents her from working since she is unmarried at the time. Despite her evident expertise in mathematics, Joan's parents claim that a lady who is "28 and unmarried" is not suitable for working independently, no less alongside men. Out of desperation, Alan proposes to Joan as a solution for her to accept his job offer. Compared to Joan, Alan was very successful in carrying out his career in mathematics — earning the title of a prodigy in his field and publishing multiple papers that got him the job of working for the government. While portraying marriage as a necessity for Joan, *The Imitation Game* portrays Alan as free to pursue his career without this constraint suggesting that having a husband is a prerequisite for a career in the STEM field for women.

Because female characters appear irrational in conflicts with their romantic partners, these films put men in a dominant position in the relationship. After Kate and Dr. Mindy's failed attempt at addressing the news of the incoming comet, Kate's boyfriend Himesh breaks up with her indirectly by publishing an article that portrays Kate as a crazy villain in his story, which went viral on the news. Kate is inevitably upset by Himesh's actions, continuously yelling "you're gonna die" to everyone in the office. Despite Kate's strong reactions, Himesh showed no remorse nor offered any apology. He even went so far as to publish a book titled "A Brush with the Devil" to insult Kate further in an interview on TV. Himesh's description of Kate on the internet presents himself as the victim, and Kate as the one to blame. Himesh villainizes Kate as a monster or a hysteric that makes people her victims. Himesh's intentional villainization of Kate portrays himself as the victim to gain the public's favor, thus gaining more power to manipulate and shame Kate for her actions. Rather than viewing Kate as the actual victim in this situation, the public view Kate as the hysteric monster-like being and continuously spew hateful comments towards her. As a result of this immense emotional pressure, Kate ultimately loses her job as an astronomer and instead goes to work as a cashier in a supermarket.

Male characters in these two films often end their romantic relationships and treat women as disposable objects. As Dr. Mindy rises in popularity on the internet, he gradually gives into the temptations of a more sexually attractive woman and cheats on his wife with the television host. Once Dr. Mindy's wife discovers his deceit, she simply gives Dr. Mindy the choice of leaving with her or staying with the television host, to which he implied to stay. In disbelief, Dr. Mindy's wife storms out of the room without mentioning whether they are breaking up. After Dr. Mindy loses hope in the government proposed solutions, he stops seeing the television host and attempts to make amends with his wife. In the end Dr. Mindy's wife accepted him to have a final dinner with the family. While Dr. Mindy is finally back with his wife and family, he cut all ties with the TV host and there was no mention of her again. Dr. Mindy's sincere wish to be forgiven by his wife justified his abandonment of the TV host, implying that it is acceptable for men to cheat as long as they apologize afterwards.

This portrays women like objects that the male character can easily dispose of or take back.

8. Conclusion

The portrayal of female scientists searching for romantic partners and acting excessively emotional in these films create stereotypical impressions of women in real life that could limit their success in STEM fields.

The Imitation Game and *Don't Look Up's* portrayal of female scientists as inferior to men and as hysterics that should be silenced continue to encourage unrealistic female stereotypes. The continuation of these stereotypes can give false impressions to younger generations about pursuing careers in STEM fields. Several studies on stereotypes have coined the term "stereotype threat" (Martignon, 2010, p. 221; Shapiro and Williams, 2012). The results of these studies have shown that

females achieved worse results with mathematical tasks, and their interest decreased when they were confronted with the stereotype that women are less talented in mathematics (Shapiro and Williams, 2012). Results from this study also show that confrontation with the stereotype affects the perception of task difficulty, which increases strain and tension. Rumination about the stereotype uses up resources that are otherwise needed for task completion, impairing performance as a result (see Macher et al., 2015). This research shows that even females who believe themselves to be competent and pursue a career in STEM still can be impaired by stereotype threat.

A study published in early 2020 in the PNAS compared gender inequality across 83 countries and 13 disciplines (Simona Dossi 1). By examining publication history of scientific authors between 1955 and 2010, the authors found that the overall gender ratio is 73% male and 27% female. This means that younger generation girls will be facing an existing challenge of entering a male dominated field while being fed the notion that girls are automatically “less talented” in STEM subjects compared to boys. By giving accurate and authentic representations of women in STEM fields, however, the younger generation of girls can be encouraged to pursue their dream careers with more certainty than misgivings. According to

Hannover’s argument in his paper, appropriate role modeling opens perspectives for identification with a subject or with a professional within a subject (Hannover and Kessels, 2004). Female characters in big budget films like *The Imitation Game* and *Don’t Look Up* for example, serve as potential role models to the films’ younger generation audience of girls. When these role models are portrayed with stereotypes however, its audience would lose confidence in their own abilities to enter STEM fields.

9. Policy implications

Admittedly, portraying female characters without pre-existing stereotypes for historical drama films such as *The Imitation Game* is tricky given filmmakers’ need to strive for historical accuracy. However, it is the filmmakers’ responsibility to make obvious to their audiences that such stereotypes are unrealistic and carry significant consequences through whatever means necessary. To be more specific, filmmakers should avoid the tendency to use certain camera shots that could diminish a female character’s physical or mental strength unless it is necessary for the overall film plot or character development.

References

- Beard, M. (2018, January 26). 'mansplaining' and silencing of women a problem that goes back to ancient times. *The Sydney Morning Herald*. Retrieved January 29, 2023, from <https://www.smh.com.au/opinion/mansplaining-and-silencing-of-women-a-problem-that-goes-back-to-ancient-times-20180123-honouj.html>
- Devereux, C. (2014). Hysteria, feminism, and gender revisited: The case of the second wave. *ESC: English Studies in Canada*, 40(1), 19–45. <https://doi.org/10.1353/esc.2014.0004>
- Dossi, S. (2022, February 14). *How is the current STEM gender bias?: Imperial News: Imperial College London*. Imperial News. Retrieved January 29, 2023, from <https://www.imperial.ac.uk/news/233901/how-current-stem-gender-bias/>.
- Ertl, B., Luttenberger, S., & Paechter, M. (2017, April 21). *The impact of gender stereotypes on the self-concept of female students in STEM subjects with an under-representation of females*. *Frontiers*. Retrieved January 29, 2023, from <https://www.frontiersin.org/articles/10.3389/fpsyg.2017.00703/full>
- Long, M., Steinke, J., Applegate, B., Knight Lapinski, M., Johnson, M. J., & Ghosh, S. (2010). Portrayals of male and female scientists in television programs popular among Middle School-age children. *Science Communication*, 32(3), 356–382. <https://doi.org/10.1177/1075547009357779>
- Miller, D. I., Eagly, A. H., & Linn, M. C. (2014). Supplemental material for women’s representation in science predicts national gender-science stereotypes: Evidence from 66 nations. *Journal of Educational Psychology*, 631–644. <https://doi.org/10.1037/edu0000005.supp>

Orthia, L. A., & Morgain, R. (2016). The gendered culture of scientific competence: A study of scientist characters in doctor who 1963–2013. *The Gendered Culture of Scientific Competence: A Study of Scientist Characters in Doctor Who 1963–2013*, 75(3-4), 79–94.

<https://doi.org/10.1007/s11199-016-0597-y>

Pattaya Mail. (2022, March 12). *Movies: Don't look up is a brilliant black comedy for our Times*. Pattaya Mail. Retrieved January 29, 2023, from <https://www.pattayamail.com/alltime/movies-dont-look-up-is-a-brilliant-black-comedy-for-our-times-391912>.

U.S. National Library of Medicine. (n.d.). *Home - PMC - NCBI*. National Center for Biotechnology Information. Retrieved January 29, 2023, from <https://www.ncbi.nlm.nih.gov/pmc/>.