

Liberal Feminism and Masculinity in Greta Gerwig's *Barbie*: A Semiotic Analysis of Ken's Identity Crisis

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A B S T R A C T

Films transcend their role as mere entertainment by serving as mediums to convey complex societal messages and ideologies. One such critical theme is feminist ideology, which addresses the entrenched power imbalance between men, traditionally perceived as strong, and women, often regarded as weak. Liberal feminism emphasizes women's rights to equality in education, income, and self-determination beyond domestic roles. Greta Gerwig's *Barbie* delves into these themes, portraying Barbie as a symbol of women's empowerment who surpasses societal limitations, contrasting sharply with Ken's subservient role. This study employs a qualitative descriptive method with causal analysis, utilizing semiotic code analysis to investigate the film's underlying messages. The findings reveal that the feminist ideology embodied by Barbie significantly impacts Ken's identity crisis. As Ken journeys with Barbie to the real world, he becomes exposed to patriarchal systems, leading him to internalize and introduce these ideologies to Barbie Land to redefine his self-worth. Ultimately, the study highlights the interplay between feminist and patriarchal ideologies, as well as their influence on individual identity formation within gendered narratives.

Keywords: *barbie movies, identity crisis, liberal feminism, semiotic.*

INTRODUCTION

The culture of society, especially society that is still deeply rooted in the understanding of the division of roles between women and men, tends to place women not as superior or even equal. According to Beauvoir (in Prameswari et al., 2019), it shows the view of women's existence in the eyes of society that women are "made" meaning that women can only take shelter behind men, whether fathers, uncles, husbands, or brothers. Women need guardians. In line with Hasibuan et al. (2017), who explained that society is wrong in understanding the perspective of gender division. Society interprets that men must be masculine while women must always be feminine, even though in reality men are allowed to show their feminine nature, conversely, women are also allowed to show their masculine side. The burden of trivial work such as household chores is placed on women, and other public life such as fulfilling economic aspects is placed only on men.

One Javanese proverb also implies the division of labor between women and men in the world of women. After marriage, women get three mandatory tasks, namely "Macak, Masak, and Manak" meaning that women are only allowed to spend time dressing up, cooking, and taking care of children. Tends to be in the domestic sphere while men have freedom outside the world with the aim of supporting women. In order to respond to the oppression and injustice that occurred, a movement emerged in women's groups called the feminist movement. According to Bendar

(2020), feminism emerged around the 18th century in Europe and peaked in the 20th century. The success of feminism is shown by the emergence of various feminist figures in many countries such as Kartini in Indonesia and Zainab Al-Ghazali from Egypt. Theories and schools of feminism have also developed, such as the emergence of existential feminism, radical feminism, and liberal feminism.

Liberal feminism has the principle of eliminating gender injustice from the patriarchal system (Rohtama et al., 2018: 228). The liberal stream of feminism tries to make women aware that their people are the oppressed part of the system that exists in society (Retnani, 2017: 99). Naomi Wolf the initiator of the theory of liberal feminism stated that this theory an oration of freedom and equality of rationality. This means that women do not need to be distinguished in terms of rationality from men, because basically, women have the same capacity and rights to express, explore, and develop themselves.

However, it turns out that the struggle of feminist ideology has a long-term impact on the side of masculinity which was initially the main opponent. According to (Kimmel et al., 2003) the dominant position of feminism gives rise to the side of feminism in men. Men become intimidated and become the object of pressure. In fact, it is not uncommon for feminism to spread to create effeminate men, they tend to be afraid and obedient. Men who continue to maintain the patriarchal system as the understanding of their dominant group are also sometimes scared of men with a high feminine side. Moreover, according to Muslimin (2019) through research with a study of a literary novel entitled "Destroy, She Said" said that women have strength that exceeds men, women can stand in the midst of men, and are worshiped and respected by them. This means that women are also able to get out of the domestic zone and have power like men.

The depiction of liberal feminism or power feminism also appears in the atmosphere of Greta Gerwig's Barbie film. The rapid development of liberal feminism in Barbieland has an influence on the elimination of Ken's identity crisis. The Barbie film contains a story about Barbie's life in Barbie Land, where they have their own unique characters. There are Barbie characters starring Margot Robbie and Ken starring Ryan Gosling. Barbie's role is more dominant with various professional roles, Barbie also has a house and personal belongings that are identical to the color pink. This is in comparison to Ken who is said to be present as a complement to Barbie, Ken often does not have time with Barbie as the character he loves. The middle setting of the story forces Barbie to go to the human world in order to maintain her natural nature as a "perfect Barbie doll". Ken secretly accompanies Barbie on her journey.

When he was in the real world, Ken realized that men had a bigger role than women so he wanted to implement the patriarchal culture in Barbieland when he returned. Ken was shown human life in the male-dominated economic sector. Ken, who previously felt that he was only a complement to Barbie with her unrequited love, created a new view of the role of men so that Ken's identity crisis disappeared. He then spread the influence of patriarchy by changing Barbieland to be under the control of the Ken family.

Through the gap between the ideology of feminism and the ideology of masculinity, it shows that the imbalance also gives rise to thoughts to maintain traditional culture such as the re-emergence of the patriarchal system. The understanding that has been instilled so far has revolved

around the scope of feminism that must be fought for but there is rarely any discussion regarding the follow-up or impact that will occur when the struggle has reached its maximum point. This study aims to explore the influence of liberal feminist ideology on the shift in masculinity with a focus on the representation of the characters Barbie and Ken in the Barbie film directed by Greta Gerwig. The analysis of signs in the film through semiotic theory provides an important contribution to the investigation into gender-based ideology.

Several researchers have conducted analyses on the feminist side of the Barbie Film, such as the research journal by Ludirja (2014) in her research it was shown that the Barbie production company, namely "Mattel" indeed aims to bring out the leadership side of girls as the main target. The scenes that mostly involve Barbie's role aim to provide motivation and show women's freedom in determining their future. Mattel shows Barbie's active involvement in the collective social environment. The second study was conducted by Boer (2013) efforts to liberate women from the domestic sphere are presented through the release of Barbie dolls with the theme of "profession". Barbie is presented as a doctor, astronaut, teacher, chef, president as a representation of equal rights with men. Barbie exceeded the market target with a profit of more than 200 million dollars. The third study was conducted by Soelistyarini (2014) who said that the representation of ideal women is done through Barbie dolls both in terms of physical appearance and social roles. Through Barbie, girls can wear their favorite items and shop with their own money without any restrictions.

The three studies have similarities in the meaning of Barbie as a symbol of free and independent feminism. Women who are free, independent, and independent in their professions are presented in dolls and feature films. Representations directed at consumers, especially girls, can be considered successful, as evidenced by increasing market sales, Barbie has become one of the icons of world feminism. However, an important point in the Barbie film is that there is an imbalance in giving roles to male dolls like Ken. Barbie emphasizes more on the important point of increasing the degree of feminism, not on equal roles or gender equality, so that in some films even the role of male dolls is minimal. At the beginning of production, it was stated that Ken was Barbie's lover and was only a side character. In the 2023 Barbie film, Ken is depicted as experiencing an identity crisis or confusion regarding his position in Barbie's eyes. Barbie films have a significant impact on young viewers and have always been an important medium in spreading social values. Therefore, it is important to understand the ideological side of liberal feminism and the declining role of masculinity through the emergence of characters. It is hoped that the film can also present an alternative representation of masculinity that is more in line with social developments and the values of gender equality.

This study will understand and explain the causal relationship between the development of feminist ideology and changes in Ken's character, as well as the way Ken's character eliminates his identity crisis through a study of semiotic code analysis. The Liberal Feminism Theory used in this study will focus on Naomi Wolf's theory. Liberal feminism in this theory has the principle of eliminating gender injustice from the patriarchal system (Rohtama, Murtadlo, and Dahri, 2018: 228). According to Wolf, women have more power than men. In addition to being strong in the domestic sphere, women are also able to dominate the world with education and income.

METHOD

The study employs a qualitative research approach, focusing on the semiotic analysis of Greta Gerwig's *Barbie* film to explore the ideological interplay between feminism and masculinity and its impact on identity construction. The primary data were derived from the film through an in-depth examination of scenes, dialogues, character interactions, clothing, thought patterns, and behaviors, particularly those of the characters Barbie and Ken. These elements were scrutinized to identify the representation of feminist and patriarchal ideologies and to understand their influence on the characters' identity development.

A semiotic framework was applied to analyze the meanings encoded in the visual and narrative elements of the film. This theoretical lens facilitates the exploration of how signs are constructed and interpreted within cultural and social contexts. By focusing on the symbolic representations within the film, the study reveals the ideological messages that underpin the narrative and their broader implications for gender discourse.

In addition to primary data, secondary sources were gathered through an extensive literature review of peer-reviewed journals, books, and other scholarly works related to feminism, masculinity, and semiotics. These resources provided a robust theoretical foundation for interpreting the findings, drawing particularly on Naomi Wolf's theory of liberal feminism and related feminist ideologies. The literature review also served to contextualize the film's representation of gender dynamics within broader sociocultural discourses.

The study adopts a descriptive qualitative method to explore and explain the imbalances between feminist and masculine ideologies as they manifest in the narrative. A causal analysis was incorporated to investigate the relationship between these ideological constructs and the identity crisis experienced by the character Ken. This methodological choice ensures a nuanced understanding of how feminist ideals influence Ken's self-perception and the shifting power dynamics in *Barbie Land*.

The research process involved the systematic identification of semiotic signs and their interpretation within the film's narrative framework. Each identified sign was analyzed in its cultural and ideological context to ascertain its significance. These findings were then cross-referenced with insights from the literature to validate and enrich the interpretations. This comprehensive approach provided a coherent synthesis of the data, allowing for a detailed exploration of the causal links between feminist ideology, patriarchal responses, and character transformation.

RESULTS AND DISCUSSIONS

Evidence of the changes in Ken's character identity that are seen as a result of the impact of feminist ideology in the Barbie film is presented in the following table:

Table 1. Evidence of the change in Ken's character identity due to feminist ideology in the Barbie film

Information	Time Mark	Proof
Ken can't interpret his presence without mentioning his connection to Barbie.	1.34.22	"I just don't know who I am without you."
Ken considers himself just a Barbie accessory.	1.34.29	"But that's Barbie and Ken." "There is no such thing as just Ken. That's why I was created."
Ken thinks he is nothing without Barbie.	1.34.49	"I only exist in the warmth of your gaze. Without it, I am a useless blond man."
Ken feels stupid and useless.	1.35.23	"I feel stupid." "I look so stupid"
Ken realizes the meaning of his creation, that Ken is just Ken, not a Barbie accessory.	1.36.08	"I am Ken."
Ken understands that what he has been doing instinctively is who he really is.	1.36.21	"I am Ken. I don't even care about being Ken anymore."

The representation of liberal feminism is depicted through the main character, Barbie. Barbie has her own house which is identical to the color pink, as well as a car and various professions to choose from. According to Naomi Wolf in *Damaiyanti* (2021), liberal feminism talks about the power and equality of rights between men and women. Women must have power in education and politics. Honor does not only lie with men, women also have the right to receive honor and make their own choices. The Barbie film depicts a condition when all the demands of feminism have been met. Barbie has earned her respective important positions in Barbie Land. Barbie becomes a president and is crowned with various achievements or awards. Barbie can have fun with other Barbies and have a fun day according to her own wishes. Barbie's feminist side is shown by the many pink colors that appear in the film, ranging from pink in the color of clothes, vehicles, houses, to the streets.

The thing highlighted in this study is the part of the film that depicts the storyline of Barbie's supporting character, Ken. Ken, who was created by the company as a complement to Barbie, can only try to attract attention to have a fun day. Ken considers himself Barbie's boyfriend so he has to accompany Barbie everywhere. The excerpt from the film represents women who do not always need men, but the depiction seems to be reversed through the character Ken. Ken, who always needs Barbie by his side. Ken attracts Barbie's attention by highlighting his strong and cool masculinity. Ken often shows off his abilities in surfing and dancing. Ken does not want to be

defeated by other dolls. Even to prove his love, Ken follows Barbie into the human world to fix Barbie's self-regulation disorder problem. Barbie, who was previously perfect as imagined by children, thinks about death and often experiences malfunctions.

According to Indriyani et al. (2020), one of the demands of liberal feminism is the fulfillment of civil rights. Supporting the policy of the law in Rasyidi (2017), one of the needs that is included in the type of civil rights is the right to obtain the same position in government according to Article 28 of the Constitution. The position of president in Barbie Land, which is also occupied by a Barbie doll, shows that women's civil rights in the film have been raised. The imbalance of roles and positions is experienced by Ken's family. In the world of Barbie Land, it seems that a place for Ken's family is not provided like Barbie's houses. Through the freedom that Barbie has, Ken often feels disappointed or sad about his love which tends to be unrequited. Barbie prefers to spend time with her friends.

Ken's view of Barbie changed when Ken unexpectedly encountered patriarchal ideology packaged in a modern frame. Ken saw muscular men with large vehicles and horses as well as office men engaged in serious conversations in neat suits. According to Rucitra et al., (2023) patriarchy in modern times does not run openly, but is embedded in a system. Like the concept found in companies or factories that accept more female workers than male workers. Conversely, men have high positions as managers. The acceptance of more female workers reflects that women are still placed in professional positions with low intellectual and ability needs.

According to Mudjiono (2011), Semiotics is equated with the word *semik*, which is the study of the meaning or significance of a sign or symbol. Semiotics can be associated with the realm of social psychology because it studies signs in the midst of people's lives. Semiotics can also be a method of communication through signs. Understanding semiotics can help in knowing where or on what basis a sign is formed. The application of semiotics in films will help interpret the message in the film and relate it. The study of semiotics can be analyzed through scenes, behavior and character traits, clothing, and spoken conversations or dialogues.

The sign of the emergence of patriarchal ideology is shown in the scene at minute 29.26, when a man on the street suddenly hits Barbie's butt. Men in the concept of patriarchy will place women below their position, including treating them as they please and even only considering women as objects to satisfy their lust. The power of patriarchy is also shown when Ken sees a man with a muscular and large body who emphasizes the symbol of strength. Jufanny & Girsang (2020) explain that men tend to emphasize strength to achieve a more dominant position. At minute 01.22.11, Ken also shows Ken who seems to show his arm muscles when talking to Barbie to look strong and not be underestimated. At that time, Ken wanted Barbie to think he was cooler. The high position of men in the world of politics, economics, and even entertainment is shown through the sign when Ken is amazed to see a video board showing American male presidents, influential American figures who are immortalized on currency, and famous American celebrities and artists who have names in the entertainment world such as Stallone in the Rambo film.

In the film clip when the character Ken is talking to one of the office employees, the employee also explains that he has implemented patriarchy with a neat concept of concealment. Ken, who is amazed by the patriarchal system that emphasizes the honor of men who have been very different

from his position in Barbie Land, is interested and enthusiastic to change the concept of Barbie Land with Kendom. The concept of Kendom places the status of men and the patriarchal system above the role of women.

The concept of patriarchy applied with the construction of Kendom, instantly makes the position of women and men in Barbie Land reversed. Men hold political control while women serve men while they are relaxing such as massaging their feet and pouring drinks. Ken also changes his appearance to be more luxurious and continues to explain the truth of patriarchy to other male dolls. In this case, the role of women is completely placed in the domestic sphere or realm. According to Widati et al. (2009), men tend to have the nature of being older or respected. Men also prefer to greet women like "sister". This greeting was also given by Ken to Barbie after he built Kendom. Ken also likened Barbie to a small refrigerator for storing drinks. According to Beauvoir in the book *Second Sex* (1949) men do not like women who have a full interest in knowledge, are committed, rebellious, brave, have character and are cultured. This is also found in the film when Ken offers Barbie to stay in Kendom by becoming his wife or girlfriend who has no desire or commitment, Barbie only has one goal to serve Ken. Men have the ambition to attain wealth, fame, and control over women.

As Barbie Land becomes threatened by the existence of Kendom, makes Barbie plan to make her friends aware of the feminist position they have built. Barbie plans to thwart Ken's plan to inaugurate Kendom in the general election. Barbie runs a scheme to make Ken's family fight each other by creating jealousy between them. Ken, who realizes his failure, is so devastated, he considers himself stupid and useless. Ken says that he was created only as Barbie's companion, nothing more. Ken's identity was created to complement Barbie. Ken only means something under Barbie's eyes. According to Aghnaita et al. (2022), identity is interpreted as a person's understanding and understanding of themselves, meaning that identity is the same as how someone assesses or positions themselves both as individuals and groups. Ken considers himself as a character who is indeed presented for Barbie, as Barbie's boyfriend, Ken should accompany Barbie wherever and whenever. But after realizing that the patriarchal ideology he forced was wrong, Ken was again confused about the meaning of his existence.

Barbie said that Ken is Ken, Ken is not Barbie's boyfriend or even just a complement to her. The proof is, even though it is wrong, Ken can cross the line to still follow the concept of the arrangement to become a supporting character in Barbie Land. Ken has the idea to make himself the main character, meaning Ken is able to think and will according to his wishes without having to force himself with the circumstances of his surroundings. Ken no longer needs to always look cool just for Barbie. At the end of the story, Ken is depicted as having begun to make peace with his meaning, he does not consider himself stupid when he is unable to position himself as Barbie's boyfriend. Ken is himself.

Through the storyline in the Barbie film, the audience or film lovers are brought to a situation where the feminist ideology that has been fought for has reached the same position or even higher than the position of men. Feminism and the women's role dominate both in the political and economic sectors. Barbie is a depiction of the success of Naomi Wolf's liberal feminist theory which touches on the power of women. With her own strength and decisions, Barbie can go to the

human world to restore her malfunctioning condition. Barbie finally makes up her mind and believes in becoming a human being. The rapid progress of liberal feminism encourages men to remember or fight for their rights again. The struggle is carried out through the application of patriarchal and masculinity ideologies with modern conceptual renewal. Through the character of Ken, it is depicted how the role of patriarchal and feminist ideologies can encourage an understanding of identity and the meaning of life.

The Barbie film presents liberal feminism that emphasizes equal rights and strength of women through the main character, Barbie. Barbie as a figure who has the freedom to choose a profession, education, and important position in Barbie Land, reflects the demands of liberal feminism for women's civil rights. In addition, the study also reveals how the character Ken was initially only presented as a complement to Barbie, but underwent a transformation when indoctrinated with modern patriarchal ideology that emphasizes male power. This reflects how men may feel threatened by the equality and strength of women in society, so they try to renew the concept of patriarchy to regain control. Thus, this study illustrates the complexity of gender and the ever-changing relationship between liberal feminism and patriarchal ideology in modern society. The impact of this study provides a better understanding of gender issues, equality, and identity in a social context, as well as being a source of inspiration for women who achieve important positions in various fields and stimulates reflection for men about their role in a society that increasingly supports gender equality. However, the Barbie film is a work of fiction, and the real struggle for gender equality is an ongoing journey with diverse roles and views that are widespread in society.

CONCLUSION

Naomi Wolf's liberal feminism pioneers the concept of women's freedom and equality with men, as it recognizes equal capacities for self-expression and development. The analysis of liberal feminism in this Barbie film study shows its influence on eliminating Ken's identity crisis through semiotic code analysis. This study provides insight into how the advancement of liberal feminist ideology prompts men to reassert their rights, and how patriarchy and feminism shape the understanding of identity and life's meaning in society related to gender stereotypes. These issues can be resolved when both sides understand each other without diminishing their respective rights. This study is limited to examining the impact of liberal feminist ideology on Ken's character in the Barbie Film. The feminist ideology present in Barbie Land affects not only Ken's character but also other aspects and characters. Based on these limitations, future research could examine the impact of liberal feminism on other aspects or characters in Greta Gerwig's Barbie film. Further studies could explore the social life and political system in Barbie Land.

REFERENCES

- Aghnaita, Norhikmah, Aida, N., & Rabi'ah. (2022). Reconstruction of Learning for Early Childhood Through the Concept of "Identity." *Jurnal Obsesi: Journal of Early Childhood Education*, 6 (4), 3253–3266. <https://doi.org/10.31004/OBSESI.V6I4.2071>
- Beauvoir, S. de. (1949). *The Second Sex*. Bantam Books.
- Bendar, A. (2020). Feminism and Social Movements. *AL-WARDAH: Journal of Women, Gender and Religion Studies*, 13 (1), 25–37. <https://doi.org/10.46339/AL-WARDAH.V13I1.156>
- Damaiyanti, M. (2021). *Women's Intellectuality in The Novel Larung by Ayu Utami (Liberal Feminism Study)*. Diponegoro University.
- Dina, F., & Nuryatin, A. (2013). Representation of Patriarchal Ideology in the Novel Tanah Tabu Radical Feminism Study. *Indonesian Literature Journal*, 2 (1), 1–6. <https://journal.unnes.ac.id/sju/index.php/jsi/article/view/2424>
- Hasibuan, L., Bimbingan, K., & Islam, K. (2017). Between Emancipation and Women's Multiple Roles (Social Fact Analysis of Gender Inequality Cases). *Hikmah*, 11 (2), 362–379. <https://doi.org/10.24952/HIK.V11I2.752>
- Indriyani, M., Bahasa, J., Mandarin, S., Bahasa, F., & Seni, D. (2020). Tokoh Utama Wanita Chen Yuerong dalam Film A Tale of Three Cities 《三城记》 Karya Alex Law dan Mabel Cheung (Perspektif Feminisme Liberal). *UNESA Journal of Mandarin Language Education*, 3 (1). <https://ejournal.unesa.ac.id/index.php/manadarin/article/view/33570>
- Jufanny, D., & Girsang, LRM (2020). Toxic Masculinity in The Patriarchal System (Critical Discourse Analysis of Van Dijk in the Film “Posesif”). *SEMIOTIKA: Jurnal Komunikasi*, 14 (1). <https://doi.org/10.30813/S:JK.V14I1.2194>
- Kimmel, M., Aronson, A., & Sapp, D. (2003). Men & Masculinities: A Social, Cultural, and Historical Encyclopedia. *English Faculty Book Gallery*. <https://digitalcommons.fairfield.edu/english-books/36>
- Mudjiono, Y. (2011). Semiotics Study in Film. *Journal of Communication Science*, 1 (1), 125–138. <https://doi.org/10.15642/JIK.2011.1.1.125-138>
- Muslimin, MF (2019). Women in The Novel Destroy, She Said by Marguerite Duras: An Analysis of Naomi Wolf's Feminism of Power. *Undas*, 15 (2), 123–134.
- Prameswari, NPLM, Nugroho, WB, & Mahadewi, NMAS (2019). Simone De Beauvoir's Existential Feminism Women's Struggle in The Domestic Sphere. *Scientific Journal of Sociology (SOROT)*, 1 (2), 1–13.
- Purnama, NC, Irawan, A., Chory, A. & Prodi, AW, Komunikasi, I., Kristen, U., & Surabaya, P. (2021). Representation of Feminism in the Film Enola Holmes. *E-Communication Journal*, 9 (2). <https://publication.petra.ac.id/index.php/ilmu-komunikasi/article/view/11543>
- Rasyidi, AF (2017). Implications of Neglecting Civil and Political Rights of Moro-Moro Community in Regional Head Elections. *Jurnal HAM*, 8 (1), 39–50. <https://doi.org/10.30641/HAM.2017.8.39-50>

- Retnani, SD (2017). Feminism in The Development of Thoughts and Law in Indonesia. *Journal of Legal Studies: ALETHEA*, 1 (1), 95–109. <https://doi.org/10.24246/ALETHEA.VOL1.NO1.P95-109>
- Rohtama, Y., Rohtama, Y., Murtadlo, A., & Dahlan, D. (2018). Struggle of The Main Characters in The Novel Pelabuhan Terakhir By Roidah: A Study Of Liberal Feminism. *Cultural Sciences: Journal of Language, Literature, Arts and Culture*, 2 (3), 221–232. <https://doi.org/10.30872/jbssb.v2i3.1147>
- Rucitra, DN, Azzahra, FA, & Wardani, I. (2023). Patriarchal Domination of PTPN X Laborers, Bobbin Industrial Unit, Arjasa District, Jember Regency. *PESHUM: Journal of Education, Social and Humanities*, 2 (4), 612–617. <https://doi.org/10.56799/PESHUM.V2I4.1808>
- Widati, S., Sastra, S., & Yogyakarta, BB (2009). Feminism in Javanese Literature: A Picture of Social Dynamics. *ATAVISME*, 12 (1), 83–96. <https://doi.org/10.24257/ATAVISME.V12I1.160.83-96>

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(Received 10-08-2024; revision received 19-10-2024,
accepted 01-11-2024; final revision received 28-11-2024)