Hypermasculinity and Space Travel: How the US Space Industry Reflects the State of the Patriarchy from the Cold War to Now

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction: White Male Overrepresentation in Space Races

From his humble beginnings as an heir to a South African emerald fortune to becoming the wealthiest man in an overwhelmingly patriarchal society, Elon Musk's involvement in the space industry is far from a coincidence. Similar themes occured on a larger scale during the 1960s with the original Space Race between the United States and the USSR to assert dominance over the Solar System. These examples of overt masculinity are connected throughout history, and the relationship between the space industry, society, and masculinity are largely intertwined.

Not only is the space industry male dominated, it has also been exclusively run by men. In over 60 years since its creation, 24 people served as head administrators at NASA – all of whom were men and all but one of whom was white (NASA, n.p.). Further, with the space industry shifting to the private field, white, male billionaires like Elon Musk, Jeff Bezos, and Richard Branson are now in charge (Weinzierl, 2018, p. 173). So, in an industry that is male dominated and funded on the backs of an economic system that rewards power, ego, and resource dominance, it is no surprise that space travel – both historically and currently – serves not only as a representation, but a product of toxic masculinity within American society.

There is a wide variety of masculinity displayed and acknowledged within society. Toxic masculinity is defined as the harmful ideas surrounding how men should behave (Cambridge, 2022). Hypermasculinity is the exaggeration of these toxic traits, such as aggressiveness and dominance (Oxford, 2017). In contrast, theories such as ecomasculinity have been created, that prioritizes the mindset that men and masculinity can be a positive force for themselves, society, and the environment (Pulé, 2009, n.p.). Shifting the relationship between masculinity and outer space from toxic to more beneficial helps create a foundation for a more equitable space industry that can serve everyone.

The Cold War Space Race was a flex of political strength and represented the masculinity crisis arising from cultural shifts, such as the rise of feminism and the threat of automation that occured throughout the 1960s (McComb, 2012, p. 275). Since then, space exploration has been largely privatized and motivations have shifted. The influences of the modern-day patriarchy on the behaviors of space entrepreneurs are largely unknown but remain incredibly relevant. It is detrimental to everyone that does not have the resources and power to influence the field for modern space travel to be driven by toxic influences such as ego and power. With issues such as climate change and wealth inequality becoming more important than ever, it is critical to approach technological development from an equitable perspective focused on improving the greater good (Osman-Elasha, n.p.). The power given to wealthy individuals in a capitalist society and the response to the emergence of a more healthy and inclusive form of masculinity intersect in the modern day space race. The influences in the Cold War era Space Race will be compared to the current space industry using tools learned from Bijker, and analyzed to determine where there is room for positive growth.

Section 1: The Evolution of Space Travel and Masculinity in the Past 50 Years

As previously stated, McComb (2012) established that the Space Race in the Cold War era represented the state of masculinity and the role of the patriarchy in the US at that time by idolizing the image of the astronaut to deflect from shifts in society such as the rise of feminism. From the nuclear arms race to the Space Race, the events surrounding the Cold War had a strong emphasis on asserting dominance and flexing superiority over the Soviet Union. Carol Cohn (1987) observed a Cold War era summer course on nuclear weapons, from which she stated that nuclear weapons in particular are "rife with overt images of competitive male sexuality" (p. 693).

It became clear to her that the nuclear war was "all about competition for manhood" after an analyst stated that it was all just "a pissing contest" (p. 696). This masculine imagery is emblematic of the wartime culture that was embedded into American society during the Cold War, a period that spanned almost half a century. The imagery also establishes what traits were idolized for an astronaut in the beginning of the space program: a strong male leader that can heroically outperform his enemies.

Beyond the direct parallels of the space program to the Cold War itself, the astronaut figure also represented the gender dynamics that occurred during the 60s. Astronauts were described as "strong, stoical, active and resourceful men" while women, or "astronauts' wives" were featured as "passive, marginalized and abjected" (Sage, 2009, p. 146).



Figure 1. Mercury 7 astronauts (left) and their wives (right). The group of astronauts who were trained to be the first in space and on the moon, the Mercury 7, and their wives, who were all in the public spotlight in the 60s, representing NASA (NASA, Morse)

This terminology depicts women as weak and dependent without an identity beyond their male partners, a useful insight of gender dynamics at this time at a larger scale. Men, particularly white men, were losing the control they had on society, though, and this too was reflected through the idolization of the astronaut figure. This loss of control by the mainly white male population was multifaceted, but partially stemmed from World War II, and the increased power that women and minority groups gained as they were able to participate in the military or successfully fulfilled the roles of men at home who were enlisted (McComb, 2012, p. 18-22) McComb (2012) argues that the rugged individualism that was focused around the control of an aircraft was a symbol for the control that the white male was losing in society, "if a woman could do it, could not anyone?" (p.277). It was only when this figure of an astronaut became less of a lone wolf leader and more of a part of a bureaucratic process that consideration was given to minorities and women.

Women and minorities have become a much more significant part of the space program, with the Group 22, the incoming class of NASA astronauts in 2017, containing 5 women and 5 people of color (Treat et al., 2020, n.p.) Though the demographics of astronauts is not the only way that the nature of space travel has changed dramatically in the past 70 years. Space travel has become less of a priority for the United States government, and the field has made a significant shift to the private sector (Weinzierl, 2018, p. 173). The figure below shows NASA's budget as a share of GDP, and fully contextualizes how dramatic the shift has been.



Figure 2. NASA Budget as a Share of GDP. During the peak of the Space Race in the 1960s, NASA's budget reached over 0.7% of GDP which has since dropped to about 0.1% (Werinzierl, 2018, p.174)

Beyond the economic shift of the space program, there has also been a large shift in motivations. Without the rivalry of the Soviet Union to push us further into space, new standards have been set. The two largest goals referenced are capitalistic pursuits, such as commercializing space for travel, and finding habitable planets to colonize, such as Mars (Weinerziel, 2018, p. 174).

For these reasons, Weinerziel (2018) deemed space the "final economic frontier" that is a new playing field for the world's wealthiest entrepreneurs to compete. These entrepreneurs include Elon Musk, founder of SpaceX, Jeffrey Bezos, founder of Blue Origin, and Richard Branson, founder of Virgin Galactic, all three of whom are multibillionaires (Bianco, 2019, n.p.). These companies all seek to create intergalactic economies with bold claims of improving the lives of everyone on Earth.

There are several reasons to believe that the portrayal of civic responsibility in the investment of space travel is a facade for personal gain of the wealthy and powerful. From a financial perspective, space has become a massive business with billions in annual revenue.

SpaceX alone has had more than \$5.5 billion in government contracts and subsidies (Weinzierl, 2018, p. 174, Hirsch, 2015, n.p.). Despite these large budgets, the current direction of the space race does not have any direct benefit to those who are on Earth. The claims of opening up space to the people to travel and explore, sit behind price tags ranging from \$250,000 up to \$55 million per seat, making it clear this is not a hobby for the masses (Nguyen, 2021, n.p.). Musk himself has described the trip to mars as a "glorious adventure" and space travel and colonization as a necessity to "be excited and inspired about the future" (Drake, 2021, n.p.). Space colonization is rooted in historically toxic masculine ideals tied to imperialism, with the space billionaires using "earthly language... of colonization" that "justify removal, extraction, exploitation and genocide," (Temmen, 2021, n.p.)

The goal of space colonization is also detrimental to the survival of those on Earth. Not only is inhabiting mars "completely unfeasible from a scientific standpoint," (Temmen, 2021, n.p.) it is also unnecessary, as the human race has about 5 billion years before the Earth becomes less habitable than another planet (Williams, 2010, p. 4). An issue that does pose a more immediate yet solvable challenge on Earth is climate change. While theoretically it is possible to do both, explore the stars and save the planet we already have, the idea of colonizing mars has "gained traction... and thus is withdrawing attention from communities mostly in the global south for whom climate change is not a threat for the distant future" (Temmen, 2021, n.p.). The space race largely resembles this tradeoff, where the space-based solutions being sought out by these billionaire entrepreneurs due to the excitement and glory of the work may actually exacerbate the planetary issues that already exist (Williams, 2010, p. 4). The view of Mother Earth and the less traditionally masculine traits of helping others over seeking excitement and profit could be a part of the connection that explains the structure of the space industry today.

Although there are clear indicators, like the use of gendered terminology and the history of the space program, that masculinity and the space industry are intertwined, the specific aspects within the sociotechnical system that support this connection remain unclear. In my research, I sought to connect the lessons and techniques used to establish the relationship between hypermasculinity, the state of gender roles in society, and the space race during the Cold War era to now.

Section 2: Applying Bijker's Comparison of American and Dutch Cultures to Evaluate the Past and Present Cultures and their Influences in the US Space Industry

In the journal paper "American and Dutch Coastal Engineering: Differences in Risk Conception and Differences in Technological Culture," Bijker (2007) draws a comparison between the history and culture of two countries to establish the reason behind different engineering practices. He analyzed two very similar papers that were both written for the 1996 International Conference on Coastal Engineering that established the different policies surrounding flood management in both countries. While there are not two directly foundational documents on the connection between society and space travel for the two time periods being analyzed like Bijker, I will use the same comparison methods with multiple source documents.

Bijker's approach focused on comparing and contrasting the historical and cultural differences between the two societies. He found that both risk management and technological cultures were areas with key differences between the US and the Netherlands, stressing that "the national style of coastal engineering is related to the national society and culture" (p. 7). He then elaborated on the differences, particularly geographical, that could lead to each different system. The political culture was also analyzed as a significant factor, with America having a larger focus on privatizing and individualizing public functions as opposed to the Netherland's larger belief in

the "common good" and a larger central role of the state (p. 7). The role of the individual citizens is also speculated on, with public perception being a large factor in the priorities of the government.

Unfortunately, there are not two very similar foundational documents to use to compare the complexities of society, politics, and technology surrounding the space race in the 1960s to now. To compensate for this I used one foundational document from the Cold War era, and a combination of sources for present day to draw sufficient comparisons within every relevant aspect of the sociotechnical system. The first foundational source, "Why Can't a Woman Fly?: Nasa and the Cult of Masculinity" by Megan Mccomb (2012), is a dissertation that evaluates the question of why the US did not attempt to counter the soviet launch of the first woman in space. Mccomb determined that the image of the astronaut represented the masculinity crisis that took place during the Cold War era by being a symbol of strength and independence in a time where bureaucracy was on the rise and the role of the individual was diminished. Additionally, McComb noted societal factors such as "feminism, homosexuality, bureaucracy, corporations" and more were all relevant factors (p. 6). The public image of the astronaut was a mere projection of the cold war masculinity crisis. McComb determined that the use of military language regarding the space program with masculine connotations drove away the idea of including women in the field, creating the "cult of masculinity" (p.81). The roles of the heroic astronaut taking control of a space capsule compared to the astronaut's wife whose job was to wait at home for him reinvigorated traditional gender roles that were being challenged at this time (p.173). The paper then concluded that the "domestication of spaceflight" (p. 261) occurred as soon as women were able to fly, thus ending the symbolism of the astronaut as the role model for masculinity.

To build a comprehensive case to compare to McComb's work, multiple sources were compiled. The first source is a journal article by Rayna Elizabeth Slobodian (2015), "Selling Space Colonization and Immortality: A Psychosocial Anthropological Critique of the Rush to Colonize Mars." Slobodian describes the current state of the space industry today, and the motivations behind it. The paper critiques the desire to expand the human race beyond planet Earth, and balances the motivations to rush to mars with the more urgent problems that occur on Earth. The paper states that the "desire to colonize space within the next decade is motivated by ego, money, and romanticism" and that "the journey to mars will not only impact those who live there, but also the lives and societies of people here on Earth" (p.1). This document provides a perspective on the technical state of the 21st century space industry, and establishes key societal problems that influence the situation, such as the climate crisis.

The next source is "Space, the Final Economic Frontier" by Matthew Weinzierl (2018) and it serves as the economic and political perspective on the issue. This paper details the privatization of the space industry and why the new structure makes a difference. The influence of money is a key difference in the cultural comparison, and Weinzierl describes how the space economy has become a big business with \$300 billion in annual revenue (p. 173).

The last source helps detail the role of gender in the 21st century. The source is a journal paper by Connor et al. (2021) titled "Perceptions and Interpretation of Contemporary Masculinities in Western Culture: A Systematic Review." This paper details the current evolution of masculinity and gender roles. Four key elements are identified to describe contemporary masculinity, "inclusivity, emotional intimacy, physicality, and resistance" which are consistent with the main forms of contemporary masculinity theories (p. 1). Modern, or contemporary, masculinity is nuanced, and while there is a significant base of toxicity within society, there is a

notable shift away from traditional gender roles and other harmful perspectives such as homophobia (p.2). Evaluating the characteristics of this shift towards a modern masculinity will be a key part of identifying how it has influenced the state of the space race today.

While there are some key differences between the analytical approach of this paper compared to that of Bijker, the comparative framework remains the same. The conclusions drawn based off of the societal, political, technical, and economical status of the US in the 1960s that were reflected in the Space Race will help provide a conclusion for the current space race after piecing together the same sociotechnical system. Similarities and differences from each time period will be analyzed and discussed. The table below provides a summary of the purpose of each foundational source.

Time Period	Title	Author	Function
1960s	Why Can't a Woman Fly?: Nasa and the Cult of Masculinity	Megan McComb (2012)	Provides the connection between the 1960s societal culture and the space race that took place at the same time.
21st century	Selling Space Colonization and Immortality: A Psychosocial Anthropological Critique of the Rush to Colonize Mars	Rayna Elizabeth Slobodian (2015)	Establishes and critiques the motivations behind the space industry today.
	Space, The Final Economic Frontier	Matthew Weinzierl (2018)	Provides an economic and political background to the space industry.
	Perceptions and Interpretation of Contemporary Masculinities in Western Culture: A Systematic Review	Sandra Connor, Kristina Edvardsson, Christopher Fisher, Evelien Spelten (2021)	Details the state of contemporary masculinity and defines terms to help categorize what is displayed throughout the space industry.

Table 1. Overview of Sources used for Bijker's Comparative Framework and their Functions. The three foundational sources of the 21st century provide different aspects of the sociotechnical system to compare to the 1960s case.

In this case, time is the separating factor between the two comparative studies instead of geography. This will add a layer of nuance within the ability to view the modern-day case as a progression of the 1960s case, which will be added to the framework to address within the results section.

Section 3: The Progression of how the Space Industry Reflects Society and the Culture of Masculinity

Comparing the texts outlining the current state of masculinity and space travel to the Cold War era highlighted a few key similarities and differences between the two time periods, outlined in table 2 below.

	1960s	21st Century	
	Space programs responded to a crisis in masculinity at the time.		
Similarities	Symbolism is used to reinforce the masculine imagery and behaviors of the space programs.		
Differences	The Space Race was connected to the Cold War conflict.	Space race is connected to the longevity of the human race and climate change as well as privatization and commercialization.	
	Public run space program by NASA.	Privatized space industry led by SpaceX, Blue Origin, and Virgin Galactic.	

Table 2. Summary of the Similarities and Differences of the Connection between each Time Period's Space Programs and the State of Masculinity. Two key similarities are derived as well as two differences, each providing their own view of how the modern space program reflects society.

The first similarity is how both eras have a clear masculinity crisis that was or is represented by the space industry. McComb (2012) states that the masculinity crisis of the 60s was characterized by the leader figure being pushed into the role of an "organization man," and

that the astronaut was an idolized version of the rugged, independent leader (p. 6). Currently, the masculinity crisis as described by Connor et. al (2021), is also rooted in the loss of control of men in society, as well as the dismantling of gender as a binary altogether. The paper describes these two types of modern day masculinity as "orthodox masculinity" which is based on the "dominance of men over women and other, less powerful men" versus the "contemporary" masculinities that challenge these stereotypes (p.1). The billionaire space race exemplifies orthodox masculinity, through its competitive nature, disregard for the wellbeing of others, and large focus of image and the admiration of others.

Another similarity between the two time periods is the use of symbolism surrounding the space industry that displays the role of toxic masculinity. As described earlier, the 1978 essay by Cohn (1987) describes the overtly sexualized terminology that is used for nuclear weapons after attending a Cold War era seminar course on the topic. This terminology surrounding nuclear bombs and missiles carried over to the terminology that described space rockets and missiles, such as the "thrust-to-weight ratio," "deep penetration," and the need to harden our missiles since the "Russians are a little harder" (Cohn, 1987, p. 693) . The image of the astronaut was carefully curated to be the "epitome of masculinity" (McComb, 2012, p.4). Beyond the technology, the success of the space program was viewed as an expression of power over the USSR, and dominating the moon symbolized domination in the Cold War.

Astronauts and space travel have remained symbolic through the modernization of the space program, and are often used to convey the same type of imagery today. For example, Jeff Bezos' space flight on July 20, 2021 was wrought with masculine symbolism. The shape of the rocket itself was undeniably phallic, shown in the image below, and while there were a variety of engineering factors that likely influenced the design, the connection to the loaded terminology of

the Cold War Era is explicit. One of the reasons for the shape was that "Jeff wanted to have the biggest windows in space," which may excuse the engineering behind the design, but shifts the focus to the hyper competitive nature between the billionaires' space travel, especially considering billionaire Richard Branson made the flight to space with his space company, Virgin Galactic, a week prior (Woodward, 2021, n.p., O'Kane, 2021, n.p.).



Figure 3. The Blue Origin Rocket that Carried Passenger Jeff Bezos on July 20th, 2021 (left) and Jeff Bezos on his way to board the rocket (right). The rocket was immediately recognized to have a particularly phallic shape, which was one of many forms of symbolism for the flight. Additionally, Bezos' outfit sparked conversation with the intentional choices of a spacesuit-like jumper and cowboy hat. (Blue Origin, 2021, gallery; Reuters, 2022)

Even beyond the rocketship design, Jeff Bezos boarded the flight in a space suit-like jumper and a cowboy hat, shown above. There was technically no need for the "space suit" since the cabin was pressurized, indicating how large of a factor the image of the flight was and trying to emulate the heroic image of the first astronauts (Lange, 2021, n.p.). The cowboy hat held symbolism as well and Lange observed that the "final frontier" of space is a "virgin, conquerable territory that lustily obsesses the space billionaires the same way the Wild West once did the railroad magnates," building on the romanticism the space entrepreneurs hold for themselves as rugged explorers (2021, n.p.).

This leads to another realm of current symbolism that dominates a lot of the narrative regarding modern day space technology: colonization (Slobodian, 2015, n.p.). Colonization has a

deep rooted history in racist and exploitative practices that benefit the few at the expense of many, and unfortunately those connotations can be carried to the colonization of mars. Slobodian's paper describes the impact of the market techniques that surround the proposed colonization of mars, and that using the language of colonization is using "old explorer narratives based on torture, death, and wealth acquisition" (p. 102).

While space exploration and the preservation of Earth could coexist, the two fields have typically been aligned against each other. The climate crisis is a significant development from the sociotechnical system that was in place in the 60s, and one that is largely interrelated to space and masculinity. Beyond the negative environmental impacts of space flight itself, "young scientists rather than working on serious environmental challenges on Earth, dream of Moon or Martian bases to save humanity, fueling the prophecy of our planetary destruction" (Williams, 2010, p. 4). This relates back to the themes of colonization with its history of sacrificing vulnerable populations against their will, so that the wealthy may accumulate more wealth and power. Additionally, "the connection to the treatment of Mother Earth to women is more than symbolic: study after study has shown that climate change globally affects women more than men" (Bianco, 2019, n.p.) and the feminine connotations behind the Earth as a matriarch may be detracting attention from the field as well.

The rejection of the advancement of feasible technological solutions that help the masses in favor of the glamorous image of space travel and the power of colonization is a prime example of orthodox masculinity. Centering oneself around an issue like climate change highlights insecurities in self image and perception, and the general shift towards contemporary masculinity challenges that. Pulé (2009) derived a connection between the concepts of contemporary masculinity with the interactions with the environment with the term "ecomasculinity" (Pulé,

2009, n.p.). Ecomasculinity identifies the toxic traits such as a desire for power in combination with a resistance to care about others, a pillar of orthodox masculinity. Pulé (2009) notes that this orthodox masculinity is a key factor that "has positioned Western men and masculine identities as the traditional perpetrators of many of the world's oppressions, as opposed to being liberators of society and the environment" (2009, p.1). While these traits are expressed by many people in power, fortunately society is shifting towards a more contemporary and inclusive form of masculinity that is reflected in ecomasculinity as well, with the base belief that "men are innately good and have infinite capacity to care for self, society and the environment" (Connor et. al, 2021, n.p., Pulé, 2009, p.1). This helps emphasize the fact that orthodox masculine behaviors of men in power do not reflect the vast majority of men, as trends have shown the direct opposite for the majority, and that the patriarchy can harm people of all genders (Connor et. al, 2021, n.p.).

The evolution from the public-run space program established by a government institution in the 60s to the current highly capitalistic privatized space industry is one the most significant shifts in society. NASA historian Joan Lisa Bromberg (2000) wrote in her book that "[NASA Administrator] Webb believed that national space policy should not be turned over to private firms. It was the government acting in the public interest" (n.p.). Weinzierl (2018) claims that a shared goal among the billionaire space entrepreneurs is achieving a fully developed space economy (p. 174). While women only made up 6.78% of NASA's workforce in 1962 (Schwartz, 2004, p. 20) and the image portrayed by astronauts during the Space Race reinforced traditional gender roles, as a public institution NASA had a significant responsibility to work to benefit the general population. The private space companies are not held to the same responsibility, despite receiving billions of dollars in subsidies from the government (Sheetz, 2004, n.p.). The pursuit of

power in the form of excessive wealth displayed by these individuals is a key part of what orthodox masculinity is (Connor et. al, 2021, p. 1). Additionally, the goals of these companies will only benefit the wealthy few, and likely disproportionately harm marginalized groups such as women of color. This occurs through the ramifications of climate change, which Balgis Osman-Elasha, a Principal Investigator with the Climate Change Unit at the United Nations, reports disproportionately impacts women, especially in the global south (n.p.). Though even beyond climate change, the exploitation of workers that is necessary to generate mass amounts of wealth negatively impacts working class people of all genders and upholds the patriarchy throughout the world. The role of the space program as a private industry upholds all of these negative consequences allowing the orthodox masculinity traits of the billionaire entrepreneurs to affect everyone.

Conclusion

Overall, the space industry of the 21st century emulates the traits of orthodox masculinity while the trend of the population moves toward contemporary masculinity. The Cold War era Space Race symbolized the masculinity crisis of that time, and the same is occurring now. Traditional masculinity is being threatened by the shift towards a more accepting society where gender itself is being redefined. Much like the individualism of the astronauts, the space billionaires are holding onto the very values that are being challenged the most by society. This has been shown through clear symbolic expressions and terminologies of male dominance, performative altruism, and the competitive capitalist nature of the space industry as it stands today. Citing causes, such as extinction of mankind as a motivation, while disregarding the

opinions of experts and scientists distracts from the toxic masculine motivations of power and glory.

Largely, this paper calls for a more in depth analysis into each facet of the relationship between the space industry and the patriarchy mentioned here. The topic is nuanced, and further benefits and revelations would most likely arise with some additional research and studies. The gap of academic work on this specific topic provided an interesting base for this paper, but results should be verified.

The implications of this paper can be viewed from a historical perspective to analyze the similarities between the Cold War era and today and can further equip us for the ever evolving gender dynamic in the U.S. This paper has shown that the voices with the most power are creating almost all of the narrative on space exploration although they are in the minority when it comes to mentality and the shift towards contemporary masculinity. Much like the astronauts, though, these figures and everything they stand for, are idolized by a base that may seek to emulate the behavior. A societal shift towards explicitly embracing contemporary and ecomasculinity can help balance the whims of extraordinarily rich entrepreneurs with action that will lead to actual societal good.

A move to a more equitable space industry would provide numerous benefits. As stated before, there are likely enough resources available to both explore space and address earthly challenges, such as climate change and wealth inequality. Space science can actually help address climate change in many ways, from developing sensors and technology to monitor Earth from space, to even learning how atmospheric changes could influence planetary climates (NASA, n.p., Temmen, 2021, n.p.). While shifting to a more equitable space industry is a

significant challenge, the first step is analysis and recognition of the problems preventing equity and why they exist, which can hopefully be established beyond this paper in future work.

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