

**What are the Current Attitudes of the Public Towards the Private Sector's Outer Space
Tourism Technology?**

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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

In July of 2021, Jeff Bezos, the billionaire CEO and founder of private space company Blue Origin, made headlines when he returned to Earth following a rocket flight that took him and three other passengers into low Earth orbit. This event sparked widespread public attention and criticism. This event was the culmination of a years-long endeavor by multiple private space companies, including Blue Origin, in order to make space flight more widely available to the public, for a price of course. This commercialization of space flight is more commonly known as space tourism. Space tourism, as the words indicate, is space travel for the purposes of novelty seeking, recreation, leisure and knowledge pursuit (FutureLearn, 2022). The entire concept of space tourism sells a dream that many people share, the ability to fly among the stars.

My STS investigation focuses on current social attitudes towards space commercialization by private companies, with a specific focus on Blue Origin's recent commercial space flights with their rocket, New Shepard. My fundamental research question is what are the current attitudes towards the technological expansion of the tourism industry into outer space and why. This question is important because there has been a recent backlash against the surge of billionaires attempting to capitalize on the excitement surrounding space travel and exploration.

The overall goal of my research is to determine whether the large increase in the space tourism market by billionaire-owned private companies is looked upon favorably by the public. In this paper I will begin with how I conducted my research and provide a description of the STS framework I will be using. I followed this up with my findings, which I will then analyze in order to determine the effect of public attitudes on future space tourism ventures. I will end by describing my thoughts on whether these attitudes will have any significant impact on the future.

Methods

I commenced my research into the public opinion of space tourism by looking into the controversial space flight done by Blue Origin in 2021 as well as reading other material written by people on the subject of space tourism. I looked at a lot of survey data done by multiple research centers in order to determine the public interest in space tourism. To find these sources, I used the UVA library database, news sites, and research centers. In my search, I included keywords such as space tourism, spaceflight, and Blue Origin. In the process of doing my research, I looked for statements made by specific people who may have an opinion on space tourism. I read comments made by Jeff Bezos, the billionaire who both currently owns and previously founded Blue Origin. I looked at accounts by Chris Smalls, an activist and former Amazon fulfillment center worker (Thorbecke, 2021). I also read remarks made by the astronaut Jose Hernandez, who represents those in the public who support space tourism. I kept in mind who was writing these commentaries and why they might feel the way that they do about space tourism, as well as how representative they are of the larger population. The story of space tourism shifts greatly, depending on who is describing it.

In addition to my investigation into public commentaries and survey data, I also held an in-person interview with an Amazon employee who is currently working as a software developer. I found my interview subject through a mutual friend who was able to introduce me. I emailed them and managed to set up a time and day that worked with their schedule to speak to them. I was primarily interested in whether or not they, as an employee working under Amazon, would have any opinions regarding Jeff Bezos's space flight excursions with Blue Origin. Especially since Jeff Bezos specifically mentioned and thanked Amazon employees in the first post-flight conference. The questions I asked the interviewee concerned whether or not he supported the

idea of space tourism in general and if he had any concerns. I also asked some questions related to Jeff Bezos and his company Blue Origin.

Frameworks

The framework I used to answer my research question is called the critical discourse analysis (CDA). The core of the CDA framework includes various qualitative methods and tools that help to explore the structure and expression of language within the social and cultural context that it is being utilized in. The term “discourse” refers to the various ways in which communication between people is achieved. The three aspects of discourse are called genres, discourses, and styles. These three aspects are described as ways of acting, ways of representing, and ways of being respectively. Norman Fairclough, one of the founders of critical discourse analysis, says that the relationship between the three aspects of meaning is a complex, dialectical one (Fairclough, 2021).

CDA is a methodology that assesses what is meant when language is used. CDA does not limit its analysis to specific structures of text or talk, but systematically relates these to their sociopolitical context. CDA examines the form, structure and content of discourse. This framework specifically examines the wording employed, its reception, and its interpretation by a wider audience. The employment of verbs, pronouns and nouns within discourse is as much part of this analysis as the assessment of the content and tone of the discourse in context. The CDA framework works for my purposes because it facilitates an assessment based upon more than just the language itself, but upon what the discourse is doing and what it is doing in its production, dissemination, and consumption.

Results

Billionaire Space Race

Blue Origin was the first among private space companies to begin offering regular suborbital space tourism flights. However, there are other private space companies that have been deeply involved in space tourism. These other players involved include both SpaceX and Virgin Galactic, which were founded by the billionaires Elon Musk and Richard Branson respectively. Blue Origin, which was founded by Jeff Bezos in 2000, was the first of these companies to be created. By attempting to capitalize on the interest in space exploration, these companies have entered into a competitive market that pits each of their resources against one another.

The competition between these three billionaires' and their respective companies has led to what people have coined "the billionaire space race." These companies have each invested significant resources and time into developing new reusable space technologies for the purposes of sending humans into space. These billionaires are all seeking to influence the future of space exploration and space tourism opportunities. Jeff Bezos and Elon Musk in particular have engaged in a rivalry over the capabilities of their space enterprises. This feud escalated during a dispute over access to a NASA launchpad and a debate about which company would be the first to successfully land a rocket (Davenport, 2021). Each of these billionaires portray their ambitions in space as a way to help humanity, with Jeff Bezos stating that Blue Origin's first crewed spaceflight represented one step toward the company's mission of expanding to a point where people live and work in space (Miao, 2021).

Blue Origin NS-16

Blue Origin's first crewed space tourism flight into suborbital space was achieved by their rocket, New Shepard, and occurred on July 20, 2021. The mission was titled, Blue Origin NS-16. The flight itself lasted approximately 10 minutes and crossed the Kármán line, which lies about 100 kilometers above mean sea level. New Shepard is a reusable suborbital rocket system specifically meant to be used in space tourism ventures. This reusability is key since the potential market of space tourists is large enough and uncertain enough that there is a need for reusable, lower-cost space access. The Blue Origin space tourist will take off vertically in a capsule on the top of a New Shepard rocket. The capsule then separates, and the tourists will descend to the Earth by parachute. Meanwhile, the rocket booster also returns to base to a vertical landing on its launch pad (Webber, 2019).

Individual Responses

Each of the companies involved in the current space tourism market have been attracting a lot of attention as well as backlash. Blue Origin in particular has been the target of many people's ire, with some saying that due to the extremely high ticket prices "it is a dangerous, elitist frivolity for the rich" (Hopkins, 2008). During the post flight conference of Blue Origin NS-16, Jeff Bezos made the following comment: "I would like to thank all Amazon customers and Amazon employees. Because you paid for all this" (Marshall, 2022). Many people took issue with this and there was widespread public outrage that was spurred on by the fact that we were in the middle of a global pandemic. Chris Smalls is an activist and former Amazon fulfillment center worker. He has been a fervent critic of the billionaire funded space tourism sector. Smalls called the billionaire space race "whitewashed" and said that Bezos' thanking Amazon employees and customers in his post flight conference was "a slap in the face" to the workers. He

is an avid protestor and works to unionize other workers in order to address racial and wealth inequality that is rampant within Amazon as well as the commercial space race (Thorbecke, 2021). The backlash that the Blue Origin NS-16 mission incurred included a 1970 spoken word poem that started trending on social media. This poem was titled "Whitey on the Moon" and was written by Gil Scott-Heron. It became a rallying cry criticizing government spending on the space program while basic needs for Black Americans were left unmet. The poem includes the statement, "I can't pay no doctor bill, but Whitey's on the Moon," which was used in 2021 to reference Jeff Bezos and his space flight (Thorbecke, 2021).

On the other side of the argument lies Jose Hernandez, a Mexican-American engineer and former NASA astronaut who traveled to the International Space Station in 2009. He believes that seeing the Earth from space is a profound experience that many should have the chance to experience and he believes that space tourism will allow for this. Hernandez supports the involvement of private space companies in future space tourism ventures and has said that "the good thing about it is we have three good viable companies that are going to give us access to space" (CBS, 2021). He believes that the commercial space race is ultimately a good thing that will encourage people to become involved in space as well as bringing in engineering jobs to the U.S.

Amazon Employee Interview

The person that I interviewed during my research into the public opinion on space tourism is a white male software developer at Amazon. The specific questions that my interview included are written out in Appendix A. The interviewee stated that he first learned about Jeff Bezos' company Blue Origin through the social media, Twitter (currently known as X). Ironically, this is the social media that is currently owned by Elon Musk. He saw the criticism of

Blue Origin in 2021, a time when people were vocally opposing Jeff Bezos' flight on social media. The thing that he was most concerned about in relation to space tourism is the environmental impact. He stated that since these trips will be for enjoyment, that the possible negative impacts to the environment are concerning. When asked about his feelings on private companies being involved in space exploration, he stated that "Privatization could result in dangerous cost cutting measures, like what occurred with the Titan submarine in 2023." He also doesn't think that he would ever be personally interested in going on a space tourism flight. He feels as though, as expensive as it is to pay to go to space, it could be much worse. He hopes that one day space tourism will be sustainable and safe enough to become more widespread.

Public Opinion Data

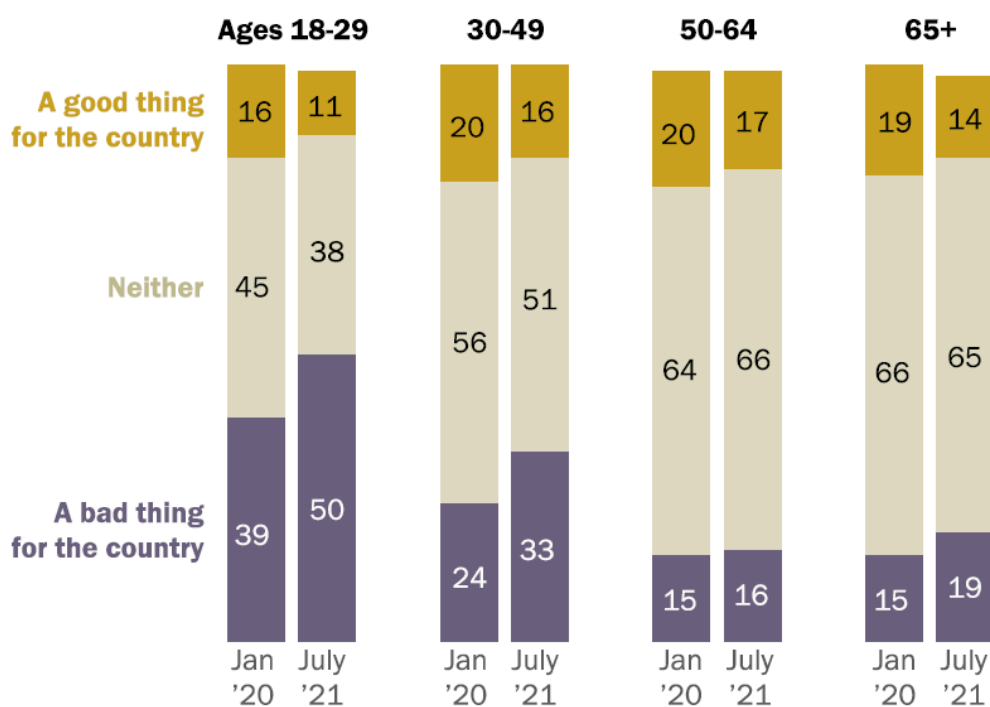
I examined survey data while considering the larger public population's opinion on space tourism. This is in order to give my research a more well rounded assessment of the opinions of the public on the topic of space tourism. The data comes from the Pew Research Center, which is a nonpartisan U.S. research center that provides public opinion polling, demographic research, content analysis and other data-driven social science research. Their surveys found that about 42% of Americans say they would definitely or probably be interested in orbiting the Earth in a spacecraft in the future, while 58% say they would not be interested. When asked about their expectations for space tourism in the next 50 years, the public was split over whether or not they think that people will routinely travel in space as tourists by the year 2068. (Strauss, 2018).

When examining the issue of opinions surrounding space tourism, I had to include consideration of the fact that some people's dislike for space tourism stems from a dislike of the billionaires themselves who have been funding and pushing for more space tourism ventures. Additionally, Blue Origin's first crewed flight occurred during the global pandemic that saw

people facing many new challenges. The pandemic exacerbated wealth inequality, and many Americans are resentful of the fact that while they struggled, the wealthy made significant gains. An increasing number of adults in the United States believe that it is detrimental to the country that certain individuals possess personal fortunes exceeding one billion dollars. Roughly three-in-ten Americans (29%) say that billionaires are not good for the country.

Figure 1

Half of adults under 30 and a third of those ages 30 to 49 now say billionaires are a bad thing for the U.S.



Note: No answer responses not shown.

Note. Pew Research Center Survey data from a survey of U.S. adults conducted July 8-18 2021.

While younger generations are statistically more likely to be interested in being a space tourist, they are also considerably more likely than older adults to say having billionaires is bad

for the country, as shown in Figure 1. This gap in opinion between age groups has grown wider over the last year (Daniller, 2021).

Analysis

Critical Discourse Analysis

Three aspects of the CDA framework are genres, discourses, and styles. The relationship between these different elements is dialectical. That is, each element partly contains the other. Social relations are partly a matter of discourse (how we talk to each other) and discourse is partly a matter of social relations (how we behave to each other).

Results of my research have led me to believe that one's opinion on space tourism and the involvement by billionaire-owned private companies is strongly connected to one's social and economic background as well as their relationship with both the scientific community and billionaires. The general public as a whole has not come to a consensus on whether or not space tourism is a good thing or not. Some more outspoken people have both loudly supported and criticized the actions of these billionaires. In general though, members on either side of the argument, both for and against continued space tourism endeavors, agree that the future of space tourism will be defined by the private sector. The consequences of this reality are already being seen with NASA's recent contract with SpaceX.

Survey Data

There are a great many people who think that billionaires are not good for the country. On top of that, there are many who think that billionaires exploit the workers under them for their own personal gain as displayed by Chris Smalls and his personal experiences. This results in many in the public who take issue with the "billionaire space race" since it is an active

reminder of the degree of wealth separation between them and many in the working class. It seems as though a majority of people don't take issue with space tourism itself but with the people who fund and support space tourism flights. Chris Smalls is emblematic of a great many people who have dealt with and worked under large corporations who treat them poorly. The root cause of a lot of inequality in the space tourism industry is the fact that both racial and economic inequalities in the U.S. have only grown in recent years.

At the same time, the positive aspects of increased involvement by billionaires in the private sector cannot be overlooked. Jose Hernandez was correct when he said that it will result in more engineering jobs in the U.S. Simply as a byproduct of requiring additional aerospace job opportunities, these private companies are currently leading a substantial surge in employment within the space exploration industry. For engineers looking for work within these companies, this is great news. The increase in jobs also results in an increase in people working on designing, building, and improving upon space flight technologies. These technological advances set the stage for the future of space exploration.

Interview

The interview I conducted was helpful in that it allowed me to get a sense of what someone else thinks about space tourism even though they are not directly affected. As an aerospace engineering student, I realize that I have a somewhat skewed perspective on space exploration as an industry. My own personal bias taints the opinions I have on space tourism. As an Amazon employee, the interviewee is working under a large company that is owned by Jeff Bezos. However, it is important to note that he is an adult white male and is paid considerably more than someone who works within an Amazon fulfillment center or warehouse. He did not have any particularly negative opinions about space tourism as an industry.

Bezos Addressing Criticism

Criticism of Bezos' 2021 space flight made many realize the state of the space tourism industry for the first time. It was the first time that my interview subject had heard of Jeff Bezos' company Blue Origin. The backlash was so widespread that Jeff Bezos himself acknowledged and responded to the criticism in an interview with CNN just before his space flight. Bezos acknowledged that there are problems "in the here and now on Earth" that need to be confronted — but added that it's also important to look toward the future. Bezos was asked for his thoughts on the critics who call the extraterrestrial flights joyrides and believe that he should be spending his time and money trying to solve problems on Earth. His response to this was "They are largely right. We have to do both. We have lots of problems here on Earth and we have to work on those." He believed that it is most important to look to the future of space while also confronting the issues that remain on Earth (Crane, 2021).

Discussion

The reason that my research matters comes back around to the future of space tourism and space exploration in general. The space tourism industry emphasizes the inequalities that currently exist here on Earth. The reality of the situation is that the future of space tourism will be defined by the private sector which is primarily owned and operated by billionaires. The public perception of space tourism greatly impacts the future of the industry. If people do not support space tourism because of negative associations with billionaires then it affects what we can accomplish in space.

The future of space tourism is currently at a critical juncture, shaped by the current attitudes toward the expansion of the private space tourism industry. The backlash against

billionaire-led private companies highlights a growing sentiment that the commercialization of space should include diverse backgrounds at the top levels of management. It becomes imperative to examine not only the technological advancements driven by a want for space tourism, but also the ethical considerations and societal implications associated with its expansion. By understanding and addressing the concerns that the public has surrounding the commercialization of space, companies can strive to ensure that the future of space exploration is guided by principles of equity, sustainability, and collective exploration.

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Appendix A.

Interview Questions List

1. What is your name?
2. What is your current occupation?
3. Have you heard of Jeff Bezos' space company Blue Origin? How?
4. What concerns or hesitations do you have about space tourism (space travel for the purposes of recreation or novelty seeking)?
5. How do you feel about billionaires, like Jeff Bezos, making private companies to try and reach space?
6. Would you be interested in being a space tourist and one day orbiting the Earth in a spacecraft? Why or why not?

How do you feel about Jeff Bezos' statement he made during a post-flight press conference, "I want to thank every Amazon employee and every Amazon customer because you guys paid for all of this."

7. Do you believe that your tax dollars are being spent well when it comes to supporting future space exploration projects?
8. For suborbital flights, Blue Origin currently charges around \$200,000 – \$300,000 per person, do you think this is reasonable?
9. Do you believe space tourism will become mainstream in the future?
10. Do you have any other comments?