THE HARDEST TO ACHIEVE, THE EASIEST TO IMAGINE: AN EXAMINATION OF PREDICTIONS ABOUT OUTER SPACE DURING THE SPACE RACE IN THE HUNTSVILLE TIMES, HOUSTON CHRONICLE, AND ORLANDO SENTINEL

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ABSTRACT

For thousands of years humans have made predictions about outer space in fictional and non-fictional works. On October 4, 1957, the Soviet Union proved space exploration was possible with the launch of the first artificial Earth satellite, Sputnik I. This event marked the beginning of The Space Race, a fierce competition between the United States and Soviet Union that changed the world forever. American newspapers not only aided in documenting the Space Race, but also featured predictions about outer space.

This study examines newspapers published near NASA's main centers during the Space Race's pivotal years, 1957 until July of 1969. This study aims to reveal what journalists and other citizens who lived near Marshall Space Flight Center in Huntsville, Alabama, Johnson Space Center in Houston, Texas, and Kennedy Space Center in Cape Canaveral, Florida predicted and discussed regarding space exploration. Journalistic theories such as framing and agenda-setting are employed to explain how conversations in these newspapers may have affected public opinion or the efforts of NASA. The themes that emerge within these articles reveal diverse attitudes about space travel, biased reporting, and hopeful predictions that may have inspired the future.

DEDICATION

This thesis is dedicated to Andy and Laura Stafford, the most important people in my life, my incredible parents. Words cannot describe how much they mean to me and the impact of their love and support.

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CHAPTER 1: INTRODUCTION

Three days after Christmas in 1955, American families may have gathered around a black-and-white television set to learn how men might make daily trips to the moon. After enchanting animations and appearances from men such as Dr. Wernher von Braun and Walt Disney, a new scene fills the frame. Four American men occupy a space vessel making its way around the Moon on a revolutionary mission. Their blue uniforms have patches with a simple rocket illustration and acronym "RM-1." As they pass over the ominous dark-side of the Moon, the captain orders the crew to fire flares to light the uncharted environment below. Before they fire the third flare, their equipment starts to pick up unusual formations and high levels of radioactivity. The captain, with a worried expression, orders the crew "to get some flares on that quick," which soon reveals a strange pattern on the dusty surface of the Moon. The wide-eyed men silently stare from the rocket's window, but do not speak of their discovery.

This scene is from the 1955 episode "Man and The Moon" from Disney's television series *Disneyland*.[1] As the United States raced to beat the Soviet Union to the Moon, the American media imagined what humans would find in space. People of all ages and backgrounds were intrigued by what might lie far above their reach. In 1969, a young child wrote to the newly founded National Aeronautics and Space Administration saying, "Dear Sir: I want to go up in space, but I want to do it while I am little and too young to be afraid of the dangers."[2] This

[1] *Disneyland,* "Man and The Moon," aired December 28, 1955. Retrieved from https://www.youtube.com/watch?v =1ZImSTxbglI.

[2] Kenneth F. Weaver, "And Now to Touch the Moon's Forbidding Face," *National Geographic Magazine,* May 1969, 633.

child's fears and curiosity represented a common emotion among Americans: a desire to explore accompanied by the anxieties of the unknown. Hundreds of movies, television shows, newspapers articles, and magazine stories from the Cold War Era attempted to predict what humans would find and accomplish through space exploration.[3]

This study examines the coverage and predictions found in American newspapers during the Space Race's pivotal years, 1957 through July of 1969. Specifically, it focuses on papers near major NASA centers, as these newspapers often covered the voices of NASA personnel or had journalists with a special interest in space. This paper will analyze these informed predictions about space to discover what motivated Americans to consider exploring the universe, identify sensationalist ideas and cultural biases that affected the coverage, and to compare predictions about space in non-fiction works to reality. Early inquiries about space were purely focused on a fascination with exploring new worlds. However, the motivations for exploring space have evolved over time to include developing groundbreaking technologies, increasing national security, and encouraging an intellectual renaissance.[4] While scientists, astronomers, and engineers work to invent the technologies required for human space flight, communicators inspired Americans to dream about the future of their lives and the universe around them.

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[3] See for example, Carl Sagan, "Mars: A New World To Explore," *National Geographic Magazine,* December 1967, 826; Hugh L. Dryden, "Footprints on the Moon," *National Geographic Magazine,* March 1964, 362-363; "Exploring Tomorrow with The Space Agency," *National Geographic Magazine,* July 1960, 62; Kenneth F. Weaver and Davis Meltzer, "That Orbed Maiden, With Fire Laden, Whom Mortals Call the Moon," *National Geographic Magazine,* February 1969, 207; Gerald Vance, "C'Mon-A My Planet," *Amazing Stories*, January 1952, https://archive.org/details/Amazin g_Stories _v26n01_1952-01_images_/page/n127; E.K. Jarvis, "Ticket to Venus," *Amazing Stories,* March 1951, 48-58, https://archive.org/details/Amazing_Stories_Volume_25_Number_3_/page /n47, 49; *Kronos,* directed by Kurt Newman, (Universal Studios, April 1957), accessed from https://archive.org/detai ls/Kronos; *War of the Worlds,* directed by Bryon Haskin, (Paramount Pictures, August 26, 1953), accessed from https://www.youtube.com/watch?v=uIitWxzBXOI; *12 To the Moon*, directed by David Bradley, (Columbia Pictures, June 1960), accessed from https://www.youtube.com/watch ?v=VVTBaeW16Yw; *The Day The Earth Stood Still,* directed by Robert Wise, (Twentieth Century Fox, December 25, 1951), accessed from https://archive.org/details/ The.Day.The.Earth.Stood.Still1951; and "Eyes In Outer Space," *Disneyland*, aired June 18, 1959, accessed from https://www.youtube.com/watch?v=t3HaWViVjF8.

[4] Roger D. Launius, "NASA's Quest for Human Spaceflight Popular Appeal," *Social Science Quarterly* 98, no. 4 (December 2017): 1218, accessed September 23, 2019, https://doi.org/doi:10.1111/ssqu.12473.

Arthur C. Clarke, a popular science writer and futurist, argued that imagining and believing in the impossible is the only way to achieve incredible feats like spaceflight and interplanetary exploration.[5] Maxwell McCombs and Donald Shaw's agenda-setting theory explains media can drive the public conversation, therefore, examining the patterns and characteristics of media predictions about space can reveal American attitudes and beliefs about the vast unknown in 1957 through 1969.[6] In addition, space coverage from before the Moon landing can be compared to recent coverage of human exploration of Mars and other space ventures.

While the agenda-setting theory is relevant to this study's purpose, framing theory is also applicable. Framing refers to how journalists draw attention to certain aspects of a story or topic, as well as the language used to describe the story. "In short, a news frame can affect an individual by stressing certain aspects of reality and pushing others into the background: The news frame has a selective function. In this way, certain issue attributes, judgments, and decisions are suggested."[7] While researchers mention that media frames are not an all-powerful force because of consumer's pre-existing beliefs and values, there is evidence that framing can affect how citizens understand important subjects.[8]

Journalists and editors from the *Huntsville Times, Orlando Sentinel,* and *Houston Chronicle* made decisions on how to present information regarding the Space Race including

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[5] Howard E. McCurdy, *Space and The American Imagination* (Baltimore, MD: John Hopkins Press, 2011).

[6] Donald L. Shaw and Maxwell McCombs, "The Evolution of Agenda-Setting Research," *Journal of Communication* 43, no 2. (1993): 53-64.

[7] Sophie Lecheler and C.H. de Vreese, *News Framing Effects: Theory and Practice* (Abingdon, UK: Routedge, 2019).

[8] Robert M. Enthman, "Framing: Towards Clarification of a Fractured Paradigm," *Journal of Communication* 43, no. 4 (1993): 51-58; Sophie Lecheler and C.H. de Vreese, *News Framing Effects: Theory and Practice* (Abingdon, UK: Routedge, 2019); Dhavan V. Shah, Nojin Kwak, Mike Schmierbach and Jessica Zubric, "The Interplay of News Frames on Cognitive Complexity," *Human Communication Research* 30, no. 1 (2004): 102–120; Dietram A. Scheufele, "Framing as a Theory of Media Effects," *Journal of Communication* 49, no. 1 (1999): 103-122.

choosing milestones to cover, what details to include, how to present Soviet and American successes and failures, and whose voices and wire stories to feature. All of these choices represent the core concerns of agenda-setting and framing theory. The articles examined in this study will reveal how local media portrayed space exploration and guided public discourse and understanding of the Space Race.

According to Howard McCurdy, author of *Space and The American Imagination,* the topic of outer space has always captured American attention.[9] The Space Race was accompanied by other monumental events such as the Vietnam War, Civil Rights Movement, and Cuban Missile Crisis, yet journalists were able to keep space a relevant topic. Today, communicators can assess the findings from this study to align their ethics and determine best practices for covering future space endeavors. NASA and commercial companies are preparing for the next major steps in human spaceflight, making this study exceptionally relevant for media creators. It's important that journalists diligently examine history and research the complex topics of today's space efforts so that they can accurately inform the public.

Method

Both the Soviet Union and United States made tremendous strides to land a man on the Moon during this study's timeline. On October 4, 1957, the Soviet Union successfully launched Sputnik 1, the first satellite in space. NASA was officially established on October 1, 1958, with 8,000 employees and a $100 million budget.[10] However, the United States had been actively working on space flight advancements before NASA formally began operations. The agency was made up of previously established labs including Langley Aeronautical Lab (1918), Ames

[9] Howard E. McCurdy, *Space and The American Imagination* (Baltimore, MD: John Hopkins Press, 2011).

[10] Bill Barry, "A Chronology of Defining Events In NASA History: 1958-1998," NASA History Division, 2012, https://history.nasa.gov/40thann/define.htm.

Aeronautical Lab (1940), Lewis Flight Propulsion Lab (1941), and two small test facilities at Muroc Dry Lake in California and one at Wallops Island, Virginia. While these labs were instrumental in advancing space flight, three other centers became the backbone of rocket development and human spaceflight including Marshall Space Flight Center (Huntsville, AL), Johnson Space Center (Houston, TX), and Kennedy Space Center (Cape Canaveral, FL).

This thesis employs a qualitative analysis of articles published between October 4, 1957, and July 20, 1969, in the *Huntsville Times, Houston Chronicle,* and *Orlando Sentinel.* This study uses thematic analysis to examine predictions and discussions found in these newspapers following launches or space-related events. According to Guest, MacQueen, and Namey, "thematic analyses move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes."[11] Throughout the news articles examined certain topics are repeated; this repetition warrants discussion. Thematic analysis derives from qualitative research which "focuses on meaning, both as an object of study and as explanatory concept."[12] Predictions and attitudes, the objects of study in this thesis, are naturally interpretative conversations. Jensen explains the nature of studying these conversations as such:

> Humans interpret their ordinary lives as well as the extraordinary events that they encounter, increasingly through communication technologies, as inherently meaningful. Researches, in turn, interpret the interpretations that individuals and groups have of themselves and their communications.[13]

[11] Greg Guest, Kathleen M. MacQueen, Emily E. Namey, *Applied Thematic Analysis* (Thousand Oaks, CA: SAGE Publications, 2012), 11.

[12] Klaus Bruhn Jensen, *A Handbook of Media and Communication Research: Qualitative and Quantitative Methodologies* (New York, NY: Routledge, 2012), 266.

[13] Ibid.

By identifying themes within NASA's local newspapers, this study revealed frames used by American journalists, attitudes from citizens, and hopes and concerns about the future of space exploration.

The *Huntsville Times, Houston Chronicle,* and *Orlando Sentinel* were chosen because of their prominence and proximity to three major NASA centers: Marshall Space Flight Center, Johnson Space Center, and Kennedy Space Center. These centers are some of the most familiar to the general public and each provide a unique expertise to the development and execution of spaceflight.[14] Marshall focuses on building spacecrafts, Johnson is known as the "heart of human spaceflight," and Kennedy is the main spaceport.[15] Past research of space coverage and predictions have mainly focused on national publications such as the *New York Times* and *Saturday Evening Post.* Therefore, this study contributes to previous research by looking into news coverage from the backyard of space exploration development. Additionally, this study examines coverage before the moon landing, which is significant because legitimate space exploration had just begun. Compared to the advanced spacecraft and media technology present today, the journalists, NASA personnel, and general public during the Space Race period had far fewer tools and knowledge to have informed conversation about space.

The *Huntsville Times* and *Houston Chronicle* were chosen because they are published in the same city as Marshall and Johnson respectively. The *Orlando Sentinel* is not in the exact city as Kennedy Space Center, however Orlando is approximately 60 miles East of Cape Canaveral. There are other publications such as *Florida Today* that are based in locations closer to the Cape. However, Gannett Co., Inc., owner of *Florida Today*, did not start the publication until 1966.

[14] Frank Seitzen, "NASA Facilities: Houston, Tranquility Base here. The Eagle has landed," NASA.gov, last modified August 6, 2008, accessed September 24, 2019, https://www.nasa.gov/50th/50th_magazine/NASAfacilities.html.

[15] Ibid.

This thesis analyzes prominent newspapers that were active during the height of the Space Race which began in 1957. Therefore, the *Orlando Sentinel* was chosen because it has been running since 1876 and is relatively close to Kennedy Space Center.

To narrow the focus of this study, specific dates were chosen related to launches or Space Race milestones between 1957 and 1969. For example, issues published a week after April 12, 1961 were examined because on that date Yuri Gagarin became the first human to fly in space. A complete list of important dates researched in this study is listed in Figure 7 in the appendix. Within these issues any article or op-ed that discussed space was examined for attitudes and predictions about what the country might achieve or discover related to space exploration. Through the use of newspapers databases, key words were searched to find stories related to the significant events. These words included "space, moon and NASA" as well as relevant words to the specific event. For example, if the launch was related to a satellite the words "satellite" and spacecraft names such as "Sputnik" were used as search words.

Through analyzing newspapers during this time period this study was able to identify themes in space-related conversation and predictions. The strategic research and interpretation of the newspapers allowed for the following research questions to be answered:

RQ1: What did newspapers published near major NASA centers predict about space during the Space Race?

RQ2: What themes emerged in the NASA-local coverage of major events during the Space Race?

RQ3: How was the coverage near NASA centers similar or different to national coverage?

Literature Review

Scholars and those in the media who have attempted to explain the human fascination

with space frequently highlight that space exploration is not a modern idea. For thousands of years humans have wondered about the universe beyond Earth. Multiple ancient civilizations attempted to depict and predict what humans might find in space.[16] As the human race progressed socially, technologically, and intellectually so did the predictions of space.

A novel mentioned repeatedly throughout the studies of space exploration in media is Johannes Kepler's *Somnium (A Dream)*, which was first published in 1634. This piece of literature is important because it is considered one of the first serious attempts to imagine how humans might reach the Moon.[17] Literary works before *Somnium* often lacked confidence in the likelihood of human spaceflight. Kepler's novel, while predominantly imaginary and magical, also considered legitimate challenges including extreme temperatures, the physical and psychological shock of escaping Earth's atmosphere, and the speed and gravitational forces that would affect a Moon landing. *Somnium* and other literary works, such as science fiction magazines, incorporated valid scientific concepts through dialogue between characters.[18] It is important to note that while early authors were writing imaginary works about space, they were also interested in exploring the scientific and technological advancements that could make their fictional dreams a reality.

Science fiction and non-fiction works from the 15th century were often controversial because of the predominant religious beliefs.[19] Scientific advancements were often seen as a

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[16] Sarah Quinn, "Surprising Science Fiction Stories from the Ancient World," *Futurism.Media, 2*016. https://vocal.media/futurism/surprising-science-fiction-stories-from-the-ancient-world.

[17] Gale Christianson, "Kepler's *Somnium:* Science Fiction and the Renaissance Scientist," *Science Fiction Studies* 3, no. 8 (March 1976) https://www.depauw.edu/sfs/backissues/8/christianson8art.htm.

[18] Brian Attebery, "The Magazine Era: 1926-1960," in *The Cambridge Companion to Science Fiction,* edited by Edward James and Farah Mendlesohn, 32-47, Cambridge Companions to Literature. Cambridge: Cambridge University Press, 2003.

[19] Brian Stableford, "Science Fiction Before the Genre," in *The Cambridge Companion to Science Fiction,* edited by Edward James and Farah Mendlesohn, 15-31, Cambridge Companions to Literature, Cambridge: Cambridge University Press, 2003.

threat to Christian beliefs because space discoveries could debunk godly explanations and encourage people to idolize technology. Christians during the 15th century adopted a geocentric belief, which was also problematic when it came to predicting space. Many scientists and astronomers faced public scrutiny for suggesting a heliocentric solar system, which in turn made it difficult for media creators to scientifically imagine space and speculate what humans might discover.[20]

A common theme found within predictive space-related media is extra-terrestrial life. *Somnium* (1643), *First Men in The Moone* (1638), Disney educational videos from the 1950s, and hundreds of other space-related media from the 1600s through the 1960s directly or indirectly hint at life in space. Scholars such as McCurdy note that humans naturally want to humanize space predictions.[21] McCurdy explains, "The vision of space exploration owes much of its power to its ability to attach itself to other cultural traditions that define human experience." Katarina Damjanov and David Crouch, authors of *Global Media Cultures among the Stars: Formations of Celebrity In Outer Space*, explain there can be difficulty in promoting space because of its unhuman and mysterious nature.[22] The fascination with alien life forms should be considered an obvious theme to be found in media's predictions of space.

Scholars also draw attention to the motives behind certain predictions of space. In *Imagining Outer Space: European Astroculture in the Twentieth Century*, Alexander Geppert points out that culture can affect an individual's reasoning for exploring space. For example,

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[20] For centuries, scientists debated and attempted to determine if the Earth or Sun was at the center of the Solar System. Those who believed in a geocentric solar system thought the Earth was at the center, while those who proposed a heliocentric solar system believed it was the Sun. It was eventually proven that the Sun is near the center of the Solar System, but the Solar System is not at the center of the universe.

[21] Howard E. McCurdy, *Space and The American Imagination,* (Baltimore, MD: John Hopkins Press, 2011).

[22] David Crouch and Katarina Damjanov, "Global Media Cultures Among the Stars: Formations of Celebrity in Outer Space," *International Journal of Cultural Studies 21*, no. 5 (2018): 553-568.

Americans tend to view space exploration as a means to gain political power and national security.[23] The founding of NASA is unique in that it was founded during a time of political tension. Americans are often concerned with the diplomatic implications of traveling to space and other planets.

McCurdy concludes there is a cultural significance in America's obsession with stories about space and that the facts and fantasies of space can become confused in consumers' minds.[24] Exposing Americans to predictions and tales of space exploration can help to inspire them; however, these imaginative storylines can blend in with reality. McCurdy explains that "the truth often turns out to be different from what people imagine it to be." For example, visionaries expected winged spaceships to provide inexpensive, reliable, and safe transportation to and from space. However, it was found that winged space ships, such as those used in NASA's shuttle missions, were extremely difficult to navigate and it is surprising that only 14 lives were lost during the 135 shuttle missions.[25]

According to McCurdy, incorrect predictions about space do not stop Americans from imagining. McCurdy brings attention to Clarke's conclusions that humans have the ability to change objective realities. Essentially, Clarke suggests that humans can change realities by believing in and reaching for the impossible, or "magic" as he sometimes puts it. McCurdy emphasizes that many space accomplishments were once thought to be totally impossible. Clarke's philosophies suggest that media predictions of space are necessary for humans to

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[23] Alexander Geppert, *Imagining Outer Space: European Astroculture in the Twentieth Century.* (London: Springer Nature, 2012).

[24] Howard E. McCurdy, *Space and The American Imagination*, (Baltimore, MD: John Hopkins Press, 2011).

[25] Bret Copeland, "How To Land The Space Shuttle…From Space," Public presentation on October 31, 2016, at Stack Overflow's 2016 Remote Meetup in Philadelphia, https://www.youtube.com/watch?v=Jb 4prVsXkZU&t=146s, Published November 6, 2018.

discover even more of the universe, and that space exploration has been inspired and guided by predictions in the media.[26]

While fictional works' predictions emanate from creative freedom, predictions from non-fiction sources can offer a direct insight into the relationship between American culture and space exploration. This study aims to discover what newspapers anticipated between 1957 and the July 1969 moon landing, with a focus on issues surrounding significant launches and space-related events. These years are significant because the Cold War and Space Race actively shaped the political and social atmosphere at this time, which in turn affected public conversation and media content.

A significant number of newspapers in the late 1950s and 60s addressed the political tensions between the United States and Soviet Union and pondered the future of humankind in space.[27] Although culture and ideology can vary dramatically across the United States, President John F. Kennedy's goal to land a man on the moon in 1969 rallied the nation to support such an incredible feat. While speaking to students at Rice University in 1962, President Kennedy said:

> We choose to go to the Moon. We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.[28]

Much of America's reasoning for space exploration was simply global prestige, which Kennedy highlights with his competitive language. However, while the United States ultimately

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[26] Howard E. McCurdy, *Space and The American Imagination*, (Baltimore, MD: John Hopkins Press, 2011).

[27] The newspapers during this study's timeline refer to the Soviet Union and its citizens with the words Russia, Russians, Soviets, Soviet, and Reds.

[28] John Fitzgerald Kennedy, "Address at Rice University in Houston Texas on the Nation's Space Effort," September 12, 1962, accessed from the JFK Library: https://www.jfklibrary.org/assetviewer/archives/JFKWHA /1962 /JFKWHA-127-002/JFKWHA-127-002.

did achieve its goal, the public was not always confident in the efforts. According to a set of Gallup and other news outlet polls, the actual moon landing was the only time in which more than half of the American public said they thought Apollo was worth the cost.[29] Former NASA Chief Historian Roger Launius believes "assuming a generally rosy public acceptance of it [Apollo] is at best a simplistic and ultimately unsatisfactory conclusion."[30] Launius explained that Americans tend to hold "contradictory attitudes" on complicated topics such as space exploration. This is certainly evident in articles from across the country, as newspapers often made fictional predictions based on facts and expert input, while being countered by op-eds that expressed frustration with the economic and social implications of NASA's goals.

James Kauffman's *Selling Outer Space* mentions that some scholars criticized the media during this time for being "the willing partner of the propaganda machine."[31] However, through examining articles on the space program in the *New York Times* and best-selling American magazines, Kauffman determined that there was a mix of "critical and uncritical coverage."[32] Negative coverage included calling NASA a wasteful, complicated, and bureaucratic monster. Kauffman explains that celebratory coverage didn't always represent a bias toward the government but towards "enduring media values including: small-town pastoralism, altruistic democracy, and individualism."[33] Despite their fascination with space exploration, when it became a reality people had varying opinions on its execution.

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[29] Roger D. Launius, "NASA's Quest for Human Spaceflight Popular Appeal," *Social Science Quarterly* 98, no. 4 (December 2017): 1218, http://libdata.lib.ua.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=127025942&site=eds-live&scope=site.

[30] Ibid.

[31] James Lee Kauffman, *Selling Outer Space: Kennedy, the Media, and Funding for Project Apollo* (Tuscaloosa, AL: University of Alabama Press, 1994), 51.

[32] Ibid, 52.

[33] Ibid, 66.

CHAPTER 2: NATIONAL PAPERS AND CONFLICTING VOICES OF TENSION AND CELEBRATION

To give context to how local papers near NASA centers were covering the Space Race, it is beneficial to examine what nationally prominent publications were predicting and reporting long before the 1969 moon landing. As efforts toward the moon landing became a source of national pride, they also required tax dollars from Americans.

National publications

Early in the twentieth century, *New York Times* writers and editors doubted the possibilities of rocket technology. For example, in 1920 the *Times* published an anonymous editorial column with two parts, "A Severe Strain on Credulity" and "His Plan Is Not Original," that pointed out significant flaws in Robert H. Goddard's rocket proposals. Goddard was an instrumental physicist in the development of liquid-fueled rockets who was initially ignored by government officials. Goddard eventually found funding from the Smithsonian Institution and the Daniel Guggenheim Foundation to continue his research, and today he is credited with being the father of modern rocket propulsion and has a NASA center named after him.[34] Nonetheless, his early days of research were often criticized, as in "Topic of The Times" *New York Times*:

> That Professor Goddard, with his 'chair' in Clark College and the countenancing of the Smithsonian Institution, does not know the relation of action to reaction, and of the need to have something better than a vacuum against which to react-to say that would be absurd. Of course, he only seems to lack the knowledge ladled out daily in high schools.[35]

[34] "Dr. Robert H. Goddard, American Rocketry Pioneer," National Aeronautics and Space Administration, last modified August 3, 2017, https://www.nasa.gov/centers/goddard/about/history/dr_goddard.html.

[35] Editorial, *New York Times,* January 13, 1920.

All that would change three days before Americans landed on the Moon in 1969. It was 24 years after Goddard's death, but the *Times* issued a brief correction and apology, although it was placed deep inside the issue.[36] An interesting note about the original criticism of Goddard, is that he was a cautious and conservative scientist. An article in the *New York Times Magazine* said he believed that "wild speculations lacking even elementary scientific basis hindered rather than helped progress."[37] Besides concerns over the feasibility of rocket technology, others worried about the political and social implications of rushing to space. In a *Christian Science Monitor* article*,* Dr. Donald M. Michael, a social psychologist, expressed concern about the public's inability to entirely understand the benefits of space exploration due to the heavily political focus. He explained that the common association between space and "catching up with the Soviet Union" was an unfortunate union. "You rarely hear of space exploration in terms of the will just to know or to make a greater place for man," Michael said, "or to make him morally and intellectually better."[38]

Carmen Merino, the first female journalist to visit Antarctica, hoped for international cooperation in space exploration. Merino said she found inspiration in the cooperativeness of multiple nations to investigate and coexist in an uncharted territory. In an *Atlanta Journal Constitution* article she said, "I hope exploration to the Moon and other planets can follow the Antarctica's harmony."[39] Merino's hopes for space were opposed by others who spoke of the "embarrassment of Americans" after the Soviet Union launched the first satellite and man into space. In "Space Scoreboard," Alton Blakeslee, a science reporter, compared the efforts of the

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[36] Editorial correction, *New York Times*, July 17, 1969.

[37] Harry M. Davis, "Fiery Rockets Roar: Forerunners Of Swift Ships Of Space," *New York Times,* September 5, 1937.

[38] John C. Waugh, "Educating Public To Space Era Urged," *Christian Science Monitor,* August 12, 1958.

[39] Sarah Cash, "History Can Be Helpful in Space Exploration," *Atlanta Journal Constitution,* January 12, 1969.

competing countries. Blakeslee's patriotic tone furthered the competitive environment of the Space Race and encouraged tension. He highlighted that Americans, while they were technically second in the race to escape Earth's atmosphere, ultimately possessed better scientific knowledge of "space near Earth."[40] While it may be true that Americans had better resources and knowledge, most Americans were hesitant to give any credit to the Soviets. As Blakeslee put it, many Americans dismissed the role of the Soviets by calling them "show-offs."[41] Jerry Bishop, a *Wall Street Journal* reporter, used phrases such as "crash-landing" and "meager information" to describe the Russians' progress.[42]

Blakeslee's encouragement to become better than the Soviets was echoed by James E. Webb, the administrator of NASA from 1961-1968. In an article he wrote for the *New York Times,* Webb warned that if Americans "permitted the Russians to surpass us, eventually we would almost certainly find ourselves on the receiving end of their advanced space technology, employed for military and economic aggression."[43] While this fear-inducing statement demonstrates the polarization of space exploration, Webb also highlighted the advantages of cooperating with other nations and sharing scientific findings with one another. The article is heavily focused on the economic, scientific, and social benefits of space exploration, and many of Webb's proposed benefits materialized, such as the creation of incredibly strong materials and technologies like GPS. Nonetheless, the diplomatic concerns involving the Soviet Union revealed the Space Race was not a friendly competition.[44] There was a real fear that space exploration would be used for militaristic power.

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[40] Alton Blakeslee, "Space Scoreboard: What Is To Be Gained In Space? What's In Space?" *Los Angeles Times,* February 26, 1961.

[41] Ibid.

[42] Jerry E. Bishop, "Space Exploration: U.S. Scientists Ready New, Unmanned Ships for Moon, Planet Trips," *Wall Street Journal,* June 22, 1961.

[43] James E. Webb, "America's Role In Space Today," *New York Times, October 8, 1961.*

[44] Ibid.

In terms of technological and scientific advancements, many nationally-prominent newspapers were reasonable in their reports. Hugh Dryden, the deputy administrator for NASA from 1958-1965, wrote "No Tourists on the Moon," an article in which he predicted the status of space exploration in the year 2000. Dryden made several correct predictions including: the creation of an international space station, the use of winged space ships, employing technology to explore past the Moon, the goal to send a man to Mars, and even that if extra-terrestrial life was not discovered men would still continue their efforts in space.[45] Dryden also made some incorrect predictions, including a statement that proposed a trip to the Moon would become a commonplace event for men. Instead, the last man to walk on the Moon was Eugene Cernan in 1972. Dryden, like many scientists and dreamers at the time, envisioned the Moon as a scientific laboratory where astronauts and scientists would reside on lunar habitats for extended periods. However, this never became the reality and lunar tourism never occurred, although it has come back into modern conversation. As NASA makes efforts to send men to Mars and commercial space companies are on the rise, some visionaries such as Elon Musk talk about the commercial value in sending citizens to space.[46]

Dryden also predicted that humans would perfect nuclear propulsion by 2000 and that scientists would develop the ability to manipulate weather patterns. While the weather statement was clearly overzealous, nuclear propulsion is still a primary research project at NASA. Overall, national newspapers during this time were fairly accurate in their predictions about space technology.[47]

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[45] Hugh Dryden, "No Tourists On The Moon," *New York Times*, April 19, 1964.

[46] "SpaceX Booked 'World's First Private Passenger for a BFR Moon Trip," *Engadget.com*, last modified September 13, 2018. https://www.engadget.com/2018/09/13/spacex-moon-bfr/.

[47] See for example, John W. Finney, "Hydrogen Chosen As Saturn's Fuel," *New York Times,* January 14, 1960; Rodney Crowther, "Space Plans' Values Cited," *Sun,* July 5, 1960; Associated Press, "Space Exploration Seen in 5-10 Years," *Christian Science Monitor,* March 21, 1959; and Sterling North, "The Nonsense Extracted From Space Exploration," *Washington Post,* June 22, 1952.

National newspapers also attempted to examine the possibilities of extra-terrestrial life. In Dryden's article, he expresses a desire for scientists to answer the question: is there life on Mars? He explains that scientists during that time believed there might be lower forms of vegetation on the Red Planet.[48] But to this day humans are still not entirely sure about the possibility of intelligent life in the Solar System. Another article from 1960 contemplates the likelihood of "neighbors." Joseph Gies, the author of the article, concludes that if other life exists it would probably be thousands of years before we hear or see proof of them.[49] Even in 1960, before men had ever breached the Earth's atmosphere, humans were aware of the vastness of the universe.

An example of radical storytelling about extra-terrestrial life was the infamous "Great Moon Hoax" in 1835. This incident involved a series of six articles that were published in the *New York Sun.* The first headline read "Great Astronomical Discoveries Lately Made." The story discussed the findings of Sir John Herschel during his trip to the Cape of Good Hope where he observed the stars. The articles explained that while looking at the moon through a telescope he discovered a variety of creatures including humans with bat-wings, unicorns, bison and goats.[50] Day two of the stories described water "nearly as blue as that of the deep ocean" on the moon's surface.[51] The articles claimed to be from the *Edinburgh Journal of Science*, however it was later revealed that the articles were fiction and Richard Adams Locke was most likely responsible for them. Some readers believed these stories were legitimate, but they were satire and intended to make fun of past speculations about the moon.[52]

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[48] Ibid.
[49] Joesph Gies, "Are space ships obsolete?" *Sun,* December 4, 1960.
[50] Sir John Hershel, "Great Astronomical Discoveries Lately Made," *New York Sun,* August 25, 1835.
[51] Sir John Hershel, "Great Astronomical Discoveries Lately Made," *New York Sun,* August 26, 1835.
[52] "The Great Moon Hoax is Published in the New York Sun," History.com, last modified August 21, 2019. https ://www.history.com/this-day-in-history/the-great-moon-hoax.

With the exception of the Moon Hoax, newspapers as a strictly truth-seeking medium naturally tended to be the voice of reason in the predictions about extra-terrestrial life and space exploration. Generally, these national newspapers focused on the political implications and technological developments associated with space exploration. They were concerned with the factually supported predictions, rarely employing a wide imagination. Space Race coverage in NASA's local papers echoed the national conversations with reasonable predictions and blatant political concerns.

The Soviet's successful launch of Earth's first satellite, Sputnik I, proved space exploration was a tangible goal for humankind, while simultaneously sparking anger, frustration, and embarrassment in the United States. These emotions were evident in articles published in the *Huntsville Times, Houston Chronicle,* and *Orlando Sentinel*. The Soviet's preliminary victory of the Space Race aggravated the tense relationship between the two world powers. A Soviet success was often followed by inflammatory headlines such as comparing the news of their satellite to the bombing of Hiroshima.[53] The political implications of space exploration were a clear concern and popular conversation in local papers. Voices in the newspapers found it difficult to determine if space achievements were to be treated as a threat, celebratory event, opportunity for comparison, or advocate for peace.

Many people considered how Soviet victories affected the safety and capabilities of the United States. A Redstone Arsenal Army scientist described his initial reactions as anger and distress, emotions commonly found in the Space Race's early years when the Soviets were continuously reaching milestones first.[54] John M. Hightower, reporter for the *Huntsville Times,*

[53] Paul Ghali, "Paris Called Red Satellite News Biggest Since Hiroshima Bomb," *Huntsville Times*, October 6, 1957.

[54] Associated Press, "U.S. Army Scientist 'Angered,'" *Houston Chronicle*, October 5, 1957.

echoed these sentiments by calling Sputnik I "a psychological victory in the cold war with Russia" and "smashing propaganda."[55] While some writers acknowledged the historical and technological benefits of Sputnik and other Soviet successes many journalists and space experts diverted attention away from the achievement by discussing the political and emotional implications.[56]

Internal tensions were present through frustrations over whether the Army or Navy should have led development of the rockets. The Navy was assigned Project Vanguard, the initial American effort to launch a satellite, which ultimately failed and was called an embarrassment.[57] Even after America had launched its first satellite, Army personnel were quick to remind the public "the Army could have done the job long before the Sputniks if it had been given the chance."[58] Harry Stine, a rocket scientist for the Martin Company Intercontinental Ballistic Missile Plant said, "We lost five years between 1945 and 1950 because nobody would listen to the rocketmen. We have got to catch up those five years fast, or we're dead."[59] Intense statements such as this were common, as many people considered that rockets could be used for combat. Air Force Chief of Staff General Curtis LeMay believed the Russian space program was entirely militaristic.[60] Paul Ghali, an editorial consultant on European affairs, wrote:

> The Soviet satellite feat carries two lessons: 1. It shows that the Soviets, ahead of the Americans, can launch their own metal bomb 560 miles into space. This means they can send guided missiles over enemy territory that same distance. 2. Until the West has caught up in those fields, Soviet diplomats will continue to behave with that arrogance they've often displayed in the past.[61]

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[55] John M. Hightower, "Russian Victory Is Smashing One," *Huntsville Times*, October 6, 1957.

[56] Associated Press, "Russia Launches Earth Satellite: U.S. Experts Amazed At Size, Weight," *Orlando Sentinel*, October 5, 1957; Editorial, "The Real Gravity" *Huntsville Times,* April 13, 1961; Editorial "Nothing short of spectacular," *Houston Chronicle,* March 19, 1965.

[57] Associated Press, "Cranky, Aging Vanguard Gets Farewell Test," *Orlando Sentinel,* September 15, 1959.

[58] "'Moon' to Shine On Texas Valley," *Houston Chronicle,* February 1, 1958.

[59] Associated Press, "Red Rockets 5 Years Ahead, Expert Warns," *Houston Chronicle,* October 5, 1957.

[60] Holmes Alexander, "Has the U.S. recognized military role in space?" *Houston Chronicle*, June 17, 1963.

[61] Paul Ghali, "Paris Called Red Satellite News Biggest Since Hiroshima Bomb," *Huntsville Times*, October 6, 1957.

The staff of the *Orlando Sentinel* also mentioned fears regarding the use of weapons in space through an anonymous quote from someone on Project Vanguard: "Frankly it's enough to scare the —— out of me. If they can do that, they can drop ICBMs on us."[62] Not only were Americans scared of war, but also how an advantage in space technology could win over countries susceptible to a Soviet overtaking.[63] A day after the successful launch of Sputnik II, an article from the Associated Press described "predictions of imminent disaster for the free world."[64]

War and world-power considerations continued to appear through the entirety of the Space Race. A *Houston Chronicle* article described the first manned space flight, accomplished by the Soviets, as "a step toward a potent new space weapons system."[65] John C. Stennis, chairman of the Senate preparedness committee, suggested that if a man could be controlled in orbit around the Earth, this could surely be done with weapons. Stennis attempted to smooth over his fear-inciting statement with a declaration that he was not trying to scare anyone, but the American people needed to consider the strategic and psychological impact of a "nation beneath orbiting weapons."[66] After Sputnik II, an editorial from the *Huntsville Times* urged the American government to put aside minor projects to maintain world leadership in rockets, missiles, space conquest, and nuclear energy.[67] Wernher von Braun emphasized "space is not a program, but a place" and after the initial amazement of space wore off, the world would have more time to consider its military capabilities.[68] Arizona Senator Barry Goldwater became frustrated that the

[62] Sentinel Staff, "Red Report Creates Concerns: Area 'Moon' Tracking Stations Not Operating," *Orlando Sentinel,* October 5, 1957.
[63] "Smashing Soviet Victories," *Huntsville Times,* October 6, 1957.
[64] Associated Press, "Sputnik II Raised Congressional Clamor," *Houston Chronicle,* November 4, 1957.
[65] Associated Press, "Russian A-Bomb Satellites Feared: Congressional Experts Cite Psychological Value," *Houston Chronicle,* April 13, 1961.
[66] Ibid.
[67] Editorial, "No Time Now to Fool," *Huntsville Times,* November 4, 1957.
[68] Bill Austin, "Outer Space Hold Military Importance," *Huntsville Times,* September 13, 1962.

United States was focused on landing a man on the moon rather than developing rockets for militaristic reasons. He believed "the nation that commands near-space could, after developing proper weapons and maneuverable space craft, dominate the Earth."[69] Space coverage in local papers was not immune to the anxieties of the Cold War as many people saw Soviet wins as threats.

In addition to fear of a violent outer space, some expressed embarrassment about Soviet achievements. An *Orlando Sentinel* article called the news of a Soviet spacewalk as "unprintable and philosophical."[70] The Soviet Union launched a satellite, animal, woman and man in space, hit the moon with a spacecraft, completed a multi-crewed mission, managed a spacewalk, completed an unmanned soft-landing on the moon, and took the first pictures from another world before the United States. The first major steps in the effort to land a man on the moon were dominated by a country that threatened America politically, emotionally, and socially. A *Houston Chronicle* editorial said, "But it appears that this country is moving, unwillingly but unavoidably into a new battlefield where the enemy is probably a march or two ahead of us."[71] A *Houston Chronicle* editorial cartoon depicted a man lying in bed with a newspaper on the ground that read "U.S. Snail Pace Into Space" (see Figure 1).

[69] Jim Hyatt, "Red Spaceship Shocking News – Goldwater," *Houston Chronicle,* October 13, 1964.
[70] Associated Press, "Gloom Falls On Moonport," *Orlando Sentinel,* March 19, 1965.
[71] Holmes Alexander, "Has the U.S. Recognized Military Role in Space?," *Houston Chronicle*, June 17, 1963.

Figure 1. Ferman Martin, "Another Sonic Boom," Houston Chronicle, April 13, 1961.[72]

In contrast to the unnerving coverage of Soviet successes, peace talks appeared as early as 1959. *Houston Chronicle* reporter Allison Sanders urged readers to ignore headlines and consider cooperation in space.[73] Sanders was one of the few female journalists to cover space in the local papers, but just like Carmen Merino, she advocated for space collaboration. World leaders from the U.S. and Soviet Union encouraged others to transform their attitudes from fearful to optimistic about peace.[74] Soviet voices may have fallen on deaf ears, however, considering how many articles discussed combat. President Lyndon B. Johnson believed space exploration had a greater potential for peace than anything else the American people and the government considered important.[75] Headlines discussing the Cold War, Vietnam War, Civil Rights Movement, and Cuban Missile Crisis surrounded the news about space. The United States

[72] Ferman Martin, "Another Sonic Boom," *Houston Chronicle*, April 13, 1961.
[73] Allison Sanders, "Headlines With an "If," *Houston Chronicle,* April 13, 1961.
[74] Associated Press, "Historic Talks Begin 4 Hours After Landing," *Orlando Sentinel,* September 15, 1959; "Russia Orbits, Returns First Man From Space," *Orlando Sentinel,* April 13, 1961; Associated Press, "Kennedy Ends Your, Bent On Peaceful Use of Space," *Huntsville Times,* September 13, 1962.
[75] Associated Press, "It's Just The Beginning, LBJ Observes," *Orlando Sentinel,* July 17, 1969.

was immersed in a pivotal point in its history and outer space seemed the only place untouched by the disorder. American astronaut John Glenn tried to explain that the goal of Project Mercury, the first human spaceflight program, had always been peaceful exploration.[76] NASA and the Soviet space program both advertised peaceful missions despite the speculations advanced by the Cold War fears. In addition to the Space Race's competitors, voices from around the world such as the Dalai Lama, foreign newspapers, and average citizens in other countries saw the scientific and political benefit for cooperation.[77] Many voices in the local papers campaigned for harmony and attempted to counter American fear.

Downplaying Soviet successes and praising the American strategy was another frequent topic found in local newspapers. President Kennedy assured the American people that "the Soviet spaceman was no cause for alarm," and American achievements would ultimately be more beneficial to mankind, hinting at a tortoise and hare approach.[78] "Slow and Steadiness," an editorial in the *Huntsville Times,* highlighted NASA's dedication to groundbreaking space accomplishments rather than reaching checkpoints first.[79] The newspapers discredited Soviet accomplishments by dismissing them as propaganda, questioning the country's integrity, and criticizing its lack of regard for cosmonaut life.[80] A *Houston Chronicle* editorial cartoon depicted a painting of the "communist moon-shot claim" and Uncle Sam in the corner asking for proof (see Figure 2).

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[76] Chris Butler, "Cape Gloomy As Reds Boast of Space Man," *Orlando Sentinel,* April 13, 1961.

[77] *New York Times Dispatch to The Sentinel*, "Hope Moon Survives: Nehru," *Orlando Sentinel*, September 15, 1959; Associated Press, "World Acclaims U.S. Success in Space Rendezvous," *Houston Chronicle,* December 16, 1965.

[78] Associated Press, "House Panel Summons Top Space Experts," *Houston Chronicle,* April 13, 1961; Associated Press, "Russia Ahead in Space: JFK," *Orlando Sentinel,* April 13, 1961.

[79] Editorial, "Slow and Steadiness," *Huntsville Times,* March 19, 1965.

[80] Editorial, "Moon Shot Expertly Timed," *Houston Chronicle,* September 15, 1959; Editorial, "Soviet Feat Disappointing but Scarcely Surprising," *Houston Chronicle,* April 13, 1961; Associated Press, "Questions Grow On Space Trip," *Orlando Sentinel,* April 13, 1961; Editorial, "American Astronaut Hurtles Through Space as World Gazes," *Houston Chronicle,* May 6, 1961.

Figure 2. Clarence Manion, "Backdrop," *Houston Chronicle*, September 15, 1959.[81]

Meanwhile, American efforts, even when they fell behind, were praised for contributing useful information and revolutionary technology.[82] For example, the day after the Soviet's launched the first man in space, NASA Director James E. Webb claimed, "Project Mercury will involve much greater responsibilities by the astronaut."[83] Reporters and editorial writers gave the American people hope of a superior space program. Some scientists insisted space exploration was not a race in the first place.[84] Conflicting statements of fear and confidence circulated in the local papers, furthering the complicated nature of space exploration.

Americans found pride in their openness about space accomplishments and failures. A *Houston Chronicle* editorial said "When we take a shot at the moon, we won't try to hide it. The

[81] Clarence Manion, "Backdrop," *Houston Chronicle*, September 15, 1959.
[82] "How U.S. and Russia Stand in Space Race," *Houston Chronicle,* December 16, 1965.
[83] United Press International, "NASA Says U.S. Plan 'Bigger,'" *Orlando Sentinel,* April 13, 1961.
[84] Associated Press, "Soviet 'Moon' Circling Globe Tracked in U.S.: Girdles Earth in 96 Min.," *Houston Chronicle,* October 5, 1957.

Russians, however, operate in strict secrecy."[85] President Nixon and reporters spread rumors that Soviets had lied about successes and were paranoid about the lack of reporting on Soviet failures.[86] Government leaders, scientists and the general public saw NASA's public display as prestigious.[87] NASA broadcasted footage of the first man in space as well as the moon landing. President Nixon gave federal employees a day off when men landed on the moon and urged private employers to do the same. He drew attention to television's role in American space exploration:

> In ages past, exploration was a lonely enterprise. But today, the miracles of space travel are matched by miracles of space communication; even across the vast lunar distances, television brings the moment of discovery into our homes and makes all of us participants.[88]

Former President Lyndon B. Johnson also praised American efforts to keep space exploration peaceful and predicted disastrous results if the public was left in the dark, left to speculate NASA's intentions.[89] The *Orlando Sentinel* drew attention to the large crowds that came to watch launches from Kennedy Space Center. These crowds were described patriotically, and as a positive product of openness, one woman even admitted the Apollo 10 launch brought tears to her eyes.[90]

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[85] Editorial, "Moon Shot Expertly Timed," *Houston Chronicle,* September 15, 1959.

[86] Associated Press "Nixon's Claim of Recent Red Failures Denied," *Orlando Sentinel,* September 15, 1959.

[87] Associated Press, "Free World Thrilled By Flight," *Orlando Sentinel*, May 6, 1961.

[88] Jack McDavitt, "Moon Day Proclaimed By Nixon," *Orlando Sentinel*, July 17, 1969.

[89] Associated Press, "Johnson Praises Civilian Management of Space Program," *Huntsville Times*, July 21, 1969.

[90] Chris Shearouse, "Birdwatchers Out In Droves," *Orlando Sentinel*, December 22, 1968; "How Many? Cape Police Can't Guess," *Orlando Sentinel,* December 22, 1968; 'Just Beautiful' Is Crowd Opinion Of Apollo Liftoff" *Orlando Sentinel,* December 22, 1968; "Cape Overwhelmed By Fender Benders," *Orlando Sentinel,* March 4, 1969; B.J. Richey, "Crowds Got Wishes As Apollo Roared Up," *Huntsville Times,* July 17, 1969; Norma Schuelke, "On Bird Watching At Its Utmost," *Orlando Sentinel,* May 19, 1969.

While fears of Soviet takeovers and patriotic American attitudes filled the newsstands, voices of distaste and annoyance with the space program could also be found. Many Americans became frustrated with the astounding cost of space exploration. John R. Chiles, reporter for the *Orlando Sentinel,* doubted every single American citizen would have willingly contributed to the $500 million spent to send a man to space because "if other planets could be reached, who would want to go there to stay? "[91] Similar concerns were expressed by a widow who received a mere $29 per month from the Veterans Bureau Widows Pension Fund.[92] Others were frustrated by the government's avoidance of issues on Earth such as ocean pollution.[93] To some individuals, space exploration seemed like a fruitless expedition, especially considering the countless earthly issues.

While unsupportive American voices existed, there were more people who saw potential in space exploration. Some journalists and space experts advocated for and correctly predicted that space exploration would result in Earth applicable technology. An *Orlando Sentinel* article proposed that critics of the space program could not see how NASA was pouring millions of dollars back into the economy, but also that critics overlooked "the things the space technology has done in the fields of medicine, geology, weather, forecasting, metallurgy and manufacturing."[94] This statement was correct and to this day NASA continues to create discovery technology that revolutionize life on Earth. NASA calls these inventions spinoffs: "a commercialized product incorporating NASA technology or expertise that benefits the public."[95] Technologies such as GPS, memory foam, freeze-dried food, firefighting equipment, DustBusters, and cochlear implants came from the development of products needed for space

[91] John R. Chiles, "Man In Space," *Orlando Sentinel*, May 6, 1961.
[92] Frances Bensinger, "Taking Care Of Widows Important As The Moon," *Orlando Sentinel*, July 25, 1969.
[93] Leonard Greenwood, "Neglect Of Ocean Research Criticized," *Huntsville Times*, December 22, 1968.
[94] "To Make Unification Work Apollo Flies Path Of Dreams," *Orlando Sentinel,* July 17, 1969.
[95] Daniel Coleman, Mike DiCicco, Naomi Seck, and John Jones, *NASA's Spinoff 2019* (Greenbelt, Maryland, Goddard Space Flight Center: National Aeronautics and Space Administration, 2019).

travel.

In addition to technology, NASA completely changed the economic status of Houston, Huntsville, and Orlando. Many local papers showed a special appreciation for NASA and being chosen as a main player in the journey to the moon. An editorial in the *Huntsville Times* said, "Huntsville, which has cooperated so splendidly in every task asked of it, will get its reward amply. For every advance or growth at Redstone will be reflected in greater population and in expansion of Huntsville. We have no doubt or uncertainty. The two must grow together."[96] Houston and Orlando also showed their appreciation for how the administration enhanced their economy and moral.[97]

The Soviets dominated the beginning of the Space Race sending Americans into a panic about the potential violent uses of space technology and exploration. The predictions of war, communist takeover, and mixed reviews show how politically exhausting the journey to the moon became. Local newspapers reveal that space exploration started as a demonstration of global superiority. The *Huntsville Times, Orlando Sentinel,* and *Houston Chronicle* published voices of paranoia, distrust, support, and patriotism, simultaneously representing and affecting the American mindset during the Space Race. While other significant American events occurred, the newspapers still managed to make space exploration and Soviet relations a featured topic.

Eventually the United States overcame the Soviet lead and once it was clear that Americans would land a man on the moon first, the paranoia began to fade but not completely disappear.[98] One writer explained that once the Soviets realized the "Americans would reap the

[96] "A Historic Day - ad Feat," *Huntsville Times,* February 1, 1958.

[97] Editorial, "Kennedy Sees Americans First On Moon, Boom for Houston." *Houston Chronicle*, September 13, 1961; Central Floridians Thrilled By Success," *Orlando Sentinel,* May 6, 1961.

[98] Skip Johnson, "Soviet Still In Moon Race, Expert Von Braun Says," *Orlando Sentinel*, March 4, 1969; "Courageous Trip Praised By Soviet," *Orlando Sentinel*, July 17, 1969.

glory of a cosmic drama," they began to withdraw economic and militaristic efforts related to space exploration.[99] A few hours before Apollo 11 astronauts lifted off from the moon, the Soviet's Luna 15 crashed somewhere on the Lunar surface, representing an epic twist in the Space Race.

There were several similarities in how national and local papers addressed the political consequences of the Space Race. Articles published across the United States rarely gave credit to Soviet accomplishments, praised the American strategy, discussed potential violent uses of outer space, and featured voices who advocated for peace. While humans were achieving incredible things during the first legitimate effort to explore space, journalists, scientists, and world leaders struggled to celebrate the milestones because of heightened tensions. The struggle between tension and celebration was evident through articles and editorials in national and NASA-local newspapers.

[99] William L. Ryan, "Why Did Soviets Quit Moon Race?" *Huntsville Times,* July 21, 1969.

CHAPTER 3: THE EFFECT OF SPACE TRAVEL ON THE HUMAN BODY AND SPIRIT

The Space Race was one of the greatest physical and technological challenges in human history. When space exploration became a legitimate goal for the United States and Soviet Union, journalists, scientists, and the public began to imagine how living creatures could survive in outer space, as well as how space travel would affect life back on Earth. Scientific forecasts and costly experiments guided the predictions about life in space for Earthly beings. The local newspapers gave voices to the experts who were making space exploration possible, critics who worried about the risks, dreamers who imagined society in space, and the explorers who dared to go where no man had gone before. Newspapers drew attention to a number of questions: What did humans have to overcome physically and mentally to reach the Moon, what materials would be required to support life, who were the best candidates for space travel, and how humans on Earth would react and adapt to the groundbreaking discoveries?

Animals and humans in space

The Space Race and NASA were always driven by the goal to "put a man in space."[100] Not only was the goal to send a single man into space, but also a crew that could support each other and control advanced space vehicles. Project Mercury was NASA's first human spaceflight program in which the missions involved one astronaut in flight. Less than a month after the Soviets sent the first human into space, America sent its first astronaut, Alan Shepard. NASA

[100] "New Civilian Space Agency Assumes Reins," *Houston Chronicle*, October 2, 1958.

quickly transitioned from one-man space adventures to multi-crewed missions during the Gemini and Apollo programs. On March 23, 1965, Gemini 3 became America's first multi-crewed mission in American history with Gus Grissom and John Young. Since the Space Race, hundreds of individuals have been to space on multi-crewed missions.[101]

There were many characteristics of space to address before sending a man to the final frontier, such as the effect of weightlessness, radiation (also referred to as cosmic rays), drastic temperature differences, and dangerous entities such as meteorites. Alton Blakeslee, a prominent science journalist, explained that Explorer I technology helped determine if these aspects posed a serious threat "to a crew of future space ships."[102] In addition to measuring radiation and other conditions using mechanical tools in a satellite, the United States and Soviet Union sent other life forms into Earth's orbit to study the effects of space travel. For example, satellites from Project Vanguard sent yeast cells and other cellular experiments into space, but soon after small mammals became the ideal experimental candidate for the Soviet Union and United States.[103]

A dog named Laika boarded the Soviet Union's Sputnik II and became the first living creature, other than a cluster of cells, to orbit the Earth. However, Dr. Allen Hyneck, associate director of the Smithsonian astrophysical observatory, explained that technology to safely return the mutt to Earth was not available at the time.[104] Laika's life support system eventually lost power and the capsule burned in the upper atmosphere. The dog's death did not occur without protest, as animal rights activists gathered in London to demand the halt of "such vile

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[101] *Human Space Flight Mission Patch Handbook,* (South Korea: AeroGraphics, 2014); A complete list of NASA missions can be found at https://www.nasa.gov/missions. During the Space Shuttle Missions (1981-2011), 355 different crew members flew into space; NASA, "Space Shuttle Era Facts," July 5, 2011, https://www.nasa.gov/pdf/566250main_2011.07.05%20SHUTTLE%20ERA%20FACTS.pdf.

[102] Alton Blakeslee, "First U.S. Satellite Is True 'Chatterbox,'' *Houston Chronicle,* February 1, 1958.

[103] "'Moon' to Shine On Texas Valley," *Houston Chronicle,* February 1, 1958; Karl Hunziker, "Ike Announces Satellite In Its Orbit," *Orlando Sentinel,* February 1, 1958.

[104] Associated Press, "Sputnik II Raised Congressional Clamor," *Houston Chronicle*, November 4, 1957.

experiments."[105] However, many others advocated for the use of animals to test-drive space capsules. Roy Essoyan, a reporter for the *Huntsville Times,* explained that animals were the first space explorers because a human sacrifice could not be made.[106] Monkeys became the popular forerunner to human astronauts and on May 28, 1959, the United States successfully returned living creatures unharmed from spaceflight for the first time: a rhesus monkey named Able and a squirrel monkey named Baker.[107] *Houston Chronicle* cartoon drawings, such as one depicting an astronaut telling monkeys to move over and make room in the space capsule and headlines such as "Monkeys Prove Man Can Take Space" and "Astronaut Could Follow During 1961" contributed to the expectation that man could achieve spaceflight (see Figure 3).[108] A majority of local news stories correctly predicted that animals were crucial to the Space Race by proving spaceflight was an obtainable dream.

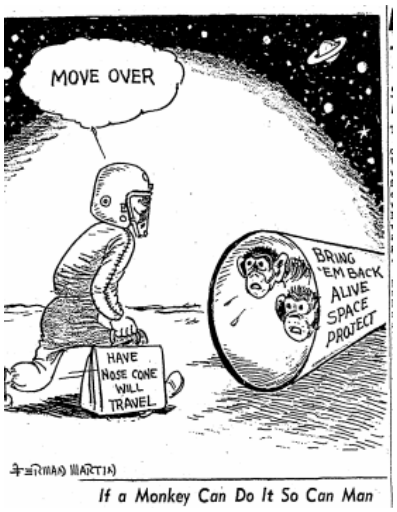

Figure 3. Ferman Martin, "Monkeys Prove Man Can Take Space," *Houston Chronicle*, May 29, 1959.[109]

[105] Associated Press, "Animal Lovers Condemn Russia's Flying Doghouse," *Houston Chronicle,* November 4, 1957; Associated Press, "British Animal Lovers Howl Monkey Space Flight 'Fiendish,'" *Orlando Sentinel,* November 4, 1957.

[106] Roy Essoyan, "Hal-Ton Orb And Payload Faring Well: Dog Races Around World At A Speed of 17, 840 M.P.H.," *Huntsville Times*, November 4, 1957.

[107] Associated Press, "Space Monkeys to Hold News Parley Saturday," *Houston Chronicle,* May 29, 1959.

[108] Ferman Martin, "Monkeys Prove Man Can Take Space," *Houston Chronicle*, May 29, 1959; "Monkeys Prove Man Can Take Space," *Houston Chronicle,* May 29, 1959; Associated Press, "Astronaut Could Follow During 1961," *Orlando Sentinel,* May 29, 1959.

[109] Ferman Martin, "Monkeys Prove Man Can Take Space," *Houston Chronicle*, May 29, 1959.

The human body and life in space

The first man in space was the Soviet Union's Yuri Gagarin. An editorial published in the *Huntsville Times* suggested that Gagarin's flight proved space travel was not as damaging as originally thought: "Space medicine men have feared the condition might affect an astronaut's well-being, touch, sight, balance, orientation and leave him with an absolute incapacity to act. Gagarin apparently has demonstrated that will be not so."[110] The editorial also mentioned a lack of psychological effects such as claustrophobia and loneliness.[111] An article from the *Houston Chronicle* stated that Gagarin felt "no loneliness" in space and the views he witnessed were "enthralling."[112] Alan Shepard's flight also appeared to prove that "weightlessness in space is a "non-spectacular event."[113]

While the local papers wanted to celebrate the potential of space travel, Gagarin and Shepard's experiences were not long enough to prove that space exploration was harmless to the human body; the local papers failed to initially discuss long-term effects. Gagarin was in space for approximately 108 minutes, while Shepard's flight lasted 14.8 minutes. People knew that a journey to the Moon would take much longer, however these short flights proved that humans could handle the intensity of a launch and survive in microgravity. Perhaps the newspapers' positive reviews served to encourage public support of the space program and keep morale high during a time when the Soviets continued to dominate. After the Mercury, Gemini, and Apollo programs, NASA continued to study how gravity fields, confinement, closed environments, radiation, and distance from Earth affected human beings.[114] In particular, microgravity has

[110] Editorial, "The Absence of Gravity," *Huntsville Times*, April 13, 1961.
[111] Ibid.
[112] Associated Press, "View Enthralling, Says Spaceman," *Houston Chronicle*, April 13, 1961.
[113] United Press International, "Shepard Found In 'Fine Shape,'" *Houston Chronicle*, May 6, 1961.
[114] Laurie J. Abadie, Charles W. Lloyd, and Mark J. Shelhamer, "The Human Body in Space," National Aeronautics and Space Administration, https://www.nasa.gov/hrp/bodyinspace.

proven to have serious effects on muscle strength and vision. During the Apollo missions, it took approximately three days to reach the Moon and each mission (from launch day to return day) lasted 9 days on average.[115] The initial coverage of the first men in space overlooked the short, premature nature of those spaceflights, perhaps misleading the public on the true effects of space.

While scientists and journalists initially addressed the effects of short-term missions, they eventually began to consider longer missions, including the journey to Mars. In an article from the *Orlando Sentinel,* a biologist explained, "whole families might travel in space ships and be intent on establishing colonies on the planets."[116] Able and Baker's capsule, also carried "egg fertilization experiments" that could provide evidence on the effect of fertilization and development of a human conceived in space.[117] Before anyone had even set foot into a space capsule, people were imagining even greater accomplishments. If one Navy space capsule had not malfunctioned on its launch day, then the United States may have brought back the first mammal (a mouse) born in space. However, unforeseen issues on launch day and the multiple failures of Project Vanguard prohibited this milestone from occurring.

Communication and comfort were other common concerns discussed in Huntsville and Orlando papers. Mariner 2, an American space probe, was sent to Venus to learn more about the neighboring planet and to test communicative technology from significant distances.[118] In an article covering the Soviet's first multi-manned crew, the comfortable, light-wool suits that the cosmonauts wore were a featured topic.[119] Apollo 7 was the first spacecraft with hot water, which was reported as a well-appreciated feature by the astronauts, especially when the

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[115] The flight to Mars is predicted to take 6-9 months, a significantly longer time than a mission to the Moon. NASA is continuously studying the human mind and body's ability to complete long and isolating missions.

[116] Associated Press, "Monkeys' Trip Shows Way To The Stars*," Orlando Sentinel*, May 29, 1959.

[117] Ibid.

[118] Associated Press, "Mariner 2 Mission Viewed As Success," *Orlando Sentinel*, August 28, 1962.

[119] Associated Press, "Soviet Trio Orbits Earth In Comfort," *Orlando Sentinel*, October 13, 1964.

commander Walter M. Schirra developed a cold.[120] During the Apollo missions, NASA worked to create bigger and better space capsules. In an article for the *Orlando Sentinel,* Dick Young described the Apollo 8 spacecraft as "a luxurious roomy model in comparison with the cramped quarters of Mercury and Gemini capsules."[121] Newspaper coverage suggested bigger space vessels were the future of space travel.

Risky business

The immense risk of human spaceflight finally revealed itself during a pre-launch test of the Apollo 1 command module. Initially a small fire broke out in the capsule but because of the pure oxygen atmosphere and complicated hatch system, flames rapidly engulfed the spacecraft, killing all three crew members, Gus Grissom, Roger B. Chaffee and Ed White. Many of the local papers described the country as heartbroken, one patron of a restaurant claimed he hadn't seen "anything like it since President Kennedy died. People left their dinner to listen to the news." [122] While some feared the tragedy would end the Apollo program, others were hopeful for its continuation. An editorial published in the *Huntsville Times* explained:

> The three astronauts who perished last evening at Cape Kennedy pass their resolve and their adventure and their goal on to those who remain. We know, from their frequent dialogue upon the topic, that anything less than full resolve to continue their program would be betrayal of them. And such a notion is cogitable.[123]

Grissom, one of the fallen astronauts, unknowingly foreshadowed his fate by asking the American people to "accept it" if he were to die as an astronaut. He believed "the conquest of space was worth the risk of life."[124] Grissom was a crew member in two missions prior to

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[120] B.J. Richey, "Pilot Gets Slight Cold, Takes Pills," *Huntsville Times*, October 12, 1968.
[121] Dick Young, "Space Chiefs Optimistic On Full Flight Success," *Orlando Sentinel*, December 22, 1968.
[122] Don North, "Cape Signs Are Draped With Black," *Huntsville Times,* January 28, 1967; Arthur Hill, "Moon Venture Put In Jeopardy By Tragic Fire," *Houston Chronicle,* January 28, 1967; Sentinel Services, "Astronaut Deaths Stun Everyone," *Orlando Sentinel,* January 28, 1967; Associated Press, "The Trip Was Known As Gus, Ed, Roger," *Huntsville Times,* January 28, 1967.
[123] Editorial, "Courage and The Goal Remain," *Huntsville Times*, January 28, 1967.
[124] Phil Garner, "NASA Names Inquiry Unit, Stays Silent," *Huntsville Times,* January 28, 1967.

Apollo, Mercury-Redstone 4 and Gemini III, and was no stranger to near-death experiences. During his Mercury mission he almost drowned when his space capsule sank in the Atlantic Ocean after splashdown. White also ominously declared he would never want his death to hold up the space program and stated, "Just think what would have happened if the first time somebody got hurt in an airplane we'd stopped fooling around with airplanes. We'd be the most backward country in the world right now."[125] Frank B. Ezell Jr., Leesburg city commissioner and professional aviator, noted, "Any time you get involved in research of a project of which we really know little, some of the pioneers are bound to be killed. It is a tragic fact, but that's the way it is."[126] General John Medaris reiterated the astronauts' awareness of the dangerous nature of the job but worried about "bleeding heart reactions" that had the potential to damage the U.S. space program's reputation.[127]

Bert West and Victor Cohn, journalists for the *Houston Chronicle*, discussed potential emergency situations astronauts could encounter such as a broken leg or sun flares on the moon, however neither of these events occurred during the Space Race.[128] An *Orlando Sentinel* article drew attention to a $10 piece of aluminum that kept Apollo 11 astronauts alive while reattaching to the command module.[129] However, even NASA administrator James E. Webb "never through the first tragedy would be on the ground."[130] Rep. Olin Teague, a "high-ranking member" of the House Aeronautics Committee, predicted that if NASA could easily find what caused the Apollo 1 tragedy, then the program would continue on as planned, however a lengthy investigation

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[125] Everett Parker, "White First Man To Take Space Walk," *Orlando Sentinel,* January 28, 1967.
[126] Sentinel Services, "Astronaut Deaths Stun Everyone," *Orlando Sentinel,* January 28, 1967.
[127] Earle Martin, "Death To Be Expected," *Orlando Sentinel,* January 28, 1967; Bob Ward, "Gen. Medaris Worries Over U.S. Reaction," *Huntsville Times,* January 28, 1967.
[128] Bert West, "Crippling Injury On Moon Seen As Major Problem of Survival," *Houston Chronicle,* July 17, 1969; Victor Cohn, "Radiation Poses Unknown Danger," *Houston Chronicle,* December 22, 1968.
[129] "A $10 Piece of Aluminum Key To Moonmen's Return," *Orlando Sentinel*, July 21, 1969.
[130] Dave Landford, "Trips Boss and Buddies Are Stunned," *Huntsville Times,* January 28, 1967.

could dramatically affect American plans.[131] The day after the fatal accident, the *Huntsville Times* published stories about space funding discussions in the senate.[132] Miraculously, no other astronauts lost their lives during the Apollo program; the next fatal mission would be in 1986 after Challenger, a spacecraft from the Shuttle Program, exploded shortly after takeoff, killing all seven crew members. The Apollo 1 disaster ultimately did not stop the efforts of the Space Race, but mixed reactions were expressed in the newspapers from where the mission originated.

Covering Space from Earth

The Space Race was not just a challenge for engineers, astronauts, and scientists working at NASA, but was also a complicated topic for journalists to research and cover. As early as 1958, journalists recognized their newfound challenge. Coleman Harwell, reporter for the *Huntsville Times* explained:

> In order to cover news today, knowledge and skills have had to be enlarged and extended. The blast of a missile into space must be reported as clearly and fully in human and scientific terms as was the flight of a single-motored plane across the Atlantic…Newspapers in a democracy are based upon the principle that a free nation depends upon an informed public. However difficult the task, newspapers must satisfy the desire of the people to know.[133]

Harwell stressed the importance of the newspapers' abilities to advance with history in order to keep the spirit of American journalism and the Space Race alive.[134] Another journalist for the *Houston Chronicle* said TV was "twisting itself into a pretzel" trying to keep up with the space program. While the ability to live-stream history was tremendously groundbreaking for the era, there were frustrations regarding the timing due to anticipation fueled by wonder and a desire to

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[131] Ronald Thompson, "U.S. Moon Goal Is Pushed Back, *Huntsville Times,* January 28. 1967.

[132] Associated Press, "Space Treaty Ratification By Senate Is Now Awaited," *Huntsville Times,* January 28, 1967.

[133] Coleman A. Harwell, "Fast-Changing World Places New Demands On Reporting," *Huntsville Times,* October 2, 1958.

[134] Ibid.

outperform the Soviets. Many of the launches and significant events during the Apollo missions were televised, and NASA became proud of its openness with the public, especially considering how the media portrayed the Soviet Union's space program and public relations.

Newspapers advocated for better educational tools that could prepare future engineers and scientists. Dr. Ernst Stuhlinger, a Marshall Space Flight Center employee, spoke to a "graduate class in space engineering in St. Louis" and predicted that at least one person in the room would "have their feet on the surface of the moon, or even Mars" in another 20 years.[135] Space-related academic programs gained more attention during the Space Race, and the 1958 National Defense Education Act provided more funding for science, math, and foreign language programs while the number of college graduates and doctorates in these fields continued to increase into the 1970s.[136] In 1959, members of a civic club in Orlando were determined to build a planetarium for the public because "the achievement of the Russians in sending a missile to the moon demonstrated the need for the study of outer space which the planetarium will make possible."[137] Voices in the local papers advocated for informed media and superior educational tools to help Americans better understand the new feat of space exploration.

Women and minorities during the space race

The Soviet Union sent the first woman, Valentina Tereshkova, to space on June 16, 1963. This milestone was met with defensive and sexist commentary from the local American papers. For example, articles published in the *Orlando Sentinel* reduced the event to a publicity stunt and propaganda.[138] Tereshkova's appearance and biological qualities were also brought to the

[135] "Key To Destiny Is In Classroom," *Huntsville Times*, January 21, 1961.

[136] "Mobilizing Minds: Teaching Math and Science in the Age of Sputnik," National Museum of American History, https://americanhistory.si.edu/mobilizing-minds/conclusion.

[137] "Meninak Told Progress of Planetarium," *Orlando Sentinel,* September 15, 1959.

[138] Associated Press, "Big Booster Aids Reds," *Orlando Sentinel*, June 17, 1963; United Press International, "Gen. Davis Terms Cosmonette Launch 'Mere Publicity Stunt,'" *Orlando Sentinel,* June 17, 1963.

forefront of the coverage. One article mentioned her powder and red-lipstick, while another described dark-circles under her eyes and her beautiful smile.[139] When asked about the role of women in space, one NASA official said, "Well there is an allowance of 125 pounds for recreational equipment aboard the Apollo spacecraft."[140] Male astronaut's appearances and suggestive activities were rarely mentioned in the newspapers, however this difference in coverage was typical for the societal atmosphere at the time. American women were systematically kept out of the Space Race by cultural norms and certain NASA qualifications.

NASA required astronaut candidates to have at least 1,000 hours of flight in a military jet aircraft, and local papers made sure to draw attention to this fact.[141] This qualification made it virtually impossible for women to join an astronaut crew. Historically, women in America had been discouraged from participating in militaristic duties associated with machinery, weapons, and combat. In 1943, the United States established the Women's Army Corps, but women mainly performed clerical, medical, and driving duties.[142] An Associated Press article published in the *Orlando Sentinel* claimed one of Tereshkova's main qualifications was her expertise in parachute jumping, which did not meet the American standard.[143] The flying qualifications for astronauts were met with conflicting opinions. Jane Briggs Hart, who was referred to as Mrs. Philip Hart (who was a senator from Michigan at the time), was a highly qualified pilot and passed astronaut physical exams. Jane said she was "more annoyed at the fear (of women in

[139] United Press International, "Space Feat Touches Off Red Frenzy," *Orlando Sentinel*, June 17, 1963; Associated Press, "First Space Women Laughs and Smiles," *Houston Chronicle*, June 17, 1963.

[140] United Press International, "U.S. Woman Unhappy That Russia Beat Us To Punch," *Orlando Sentinel,* June 17, 1963.

[141] United Press International, "Gen. Davis Terms Cosmonette Launch 'Mere Publicity Stunt,'" *Orlando Sentinel*, June 17, 1963; United Press International, "Skill, Brains Only Musts For Woman Fliers," *Orlando Sentinel*, June 17, 1963; United Press International, "U.S. Woman Unhappy That Russia Beat Us To Punch," *Orlando Sentinel,* June 17, 1963.

[142] "Women in The Army," U.S. Army, https://www.army.mil/women/history/.

[143] Associated Press, "Big Booster Aids Reds," *Orlando Sentinel*, June 17, 1963.

space) than she was impressed" and that "the U.S. is 100 years behind in using the full abilities of women."[144] Meanwhile, Betty Skeleton, a well-known pilot who trained with Mercury astronauts, claimed "having a woman astronaut in America's space program might be injecting unneeded problems into our space program which already has problems enough."[145] Skeleton believed that the overall goals of the space program overruled a need for diverse astronauts.

An article published in the *Orlando Sentinel* focused on the biological differences between women and men and expected women to play an important role in the colonization of space: "The time may well come when women will be in demand for long space voyages because of their exclusive biological qualifications. But that time is in the distant future."[146] Dr. Joseph Connor, an aerospace medicine expert from NASA, believed women would be useful when missions reached "the outermost edge of the solar system."[147] Not only were birthing abilities and colonization hot topics regarding women in space, some expressed concerns about their menstruation cycles and breasts fitting into the astronaut suits. The article from the *Orlando Sentinel* also discussed the differences in strength between men and women, claiming that when spacecrafts became "roomier" and physical endurance becomes less critical, women would become more competitive than men.[148] Ultimately, women were excluded from the Space Race for characteristics that had been used against them for centuries. One woman attempted to promote female astronauts by claiming women "eat less, use less oxygen, have a higher pain

[144] United Press International, "U.S. Woman Unhappy That Russia Beat Us To Punch," *Orlando Sentinel,* June 17, 1963.
[145] Ibid.
[146] United Press International, "Skill, Brains Only Musts For Woman Fliers," *Orlando Sentinel,* June 17, 1963.
[147] Ibid.
[148] Ibid.

tolerance and emotional strength," but her arguments were dismissed as "sweeping comments."[149]

The wives of astronauts were women directly affected by the Space Race. A great deal of the Apollo mission coverage included articles that discussed their reactions to the launches.[150] Similar to the topic of female astronauts, sexist undertones were also present in this coverage. Saralee Tiede, reporter for the *Houston Chronicle,* wrote that one of the wives did chores to keep her mind off of the nerves.[151]

The Space Race severely lacked diversity. Individuals of color and non-white races were virtually non-existent in local paper's coverage. Women faced criticism or biased coverage and it was clear the Space Race did not prioritize inclusion. It was not until 1983 that Sally Ride became the first American woman to visit space and Guion Stewart Bluford Jr. became the first African-American.

Local papers recognized that space exploration would not only pose major challenges related to survival, but that it would also significantly impact life on Earth. Physical concerns such as the effect of microgravity, emotional threats such as loneliness, and cultural implications such as educational reform were some of the topics addressed. Voices in the articles correctly predicted that discoveries made through space exploration would result in Earth-applicable technology as well as test the abilities of non-space personnel to comprehend the findings. Local papers' concerns over the effect of space on the human body and spirit reveal the magnitude of the Space Race and space exploration.

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[149] Ibid.

[150] Associated Press, "Space Feat Thrill Wives," *Orlando Sentinel,* December 16, 1965; "Wives Watch and Say Prayers" *Orlando Sentinel*, December 22, 1968; Associated Press, "Astros' Wives Pray, Wait," *Huntsville Times*, December 22, 1968.

[151] Saralee Tiede, "Astronauts' Wives How They Reacted," *Houston Chronicle,* December 22, 1968.

CHAPTER 4: DIRECT PREDICTIONS ABOUT THE FUTURE OF SPACE EXPLORATION

Space Race milestones encouraged Americans to be confident about the future of space exploration. The *Huntsville Times, Orlando Sentinel,* and *Houston Chronicle* published direct predictions about what humans would achieve during and after the journey to the Moon. While forecasts from the Space Race were not the first or only attempt by humans to predict what was in space, the conversations during this time period were influenced by extraordinary circumstances and legitimate breakthroughs in technological abilities. A cartoon from the *Houston Chronicle* depicted a man walking up a flight of stairs with the steps labeled spaceflight, orbit, Moon, Venus, and Mars, as each step symbolized the hopes for future endeavors (see Figure 4).

Figure 4. Ferman Martin, "The First Step," *Houston Chronicle,* May 6, 1961.[152]

[152] Figure 4. Ferman Martin, "The First Step," *Houston Chronicle,* May 6, 1961.

Early predictions in the Space Race (1957-1961)

After the successful launch of Sputnik I and II, newspapers displayed a confident attitude about the prospect of more satellites and a Moon landing from both space programs. After the launch of Sputnik I, a Soviet rocket scientist said, "It can now be said with confidence that in a few years flights to the Moon with instruments will become as much a reality as the launching of the first artificial satellites."[153] Dr. John D. Rinehart, assistant director of an observatory in Houston, firmly believed the Russians would reach the Moon days after the launch of Sputnik II.[154] Scientists at the Smithsonian Astrophysical Institute in Cambridge believed the Russians would reach the Moon within a week of Sputnik II.[155] They weren't the only individuals to predict more Soviet victories; Washington's Senator Henry Jackson said, "The new Soviet launching shows Moscow is taking away American's historic trump card- its industrial and scientific supremacy."[156] However, Rinehart and the scientists' predictions were incorrect; it took another two years before the Russians would be the first to successfully land a spacecraft on the Moon. These direct predictions displayed a fear of inferiority to the Soviets and an assumption that one Soviet success foreshadowed a Soviet takeover of the entire Space Race. Conversely, Defense Secretary Neil H. McElroy claimed Sputnik II would not have a substantial effect on the U.S. missile program, and while the pressure was high, the program was in good shape.[157]

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[153] Associated Press, "Soviet 'Moon' Circling Globe Tracked in U.S.: Girdles Earth in 96 Min.," *Houston Chronicle,* October 5, 1957.

[154] Associated Press, "Sputnik II Raised Congressional Clamor," *Houston Chronicle,* November 4, 1957.

[155] Sentinel Services, "U.S. Scientists Forecast Rocket Will Reach Moon Within Week," *Orlando Sentinel,* November 4, 1957.

[156] Ibid.

[157] Ibid.

An article published the day after Yuri Gagarin's flight predicted the Russians would build a space station or base on the Moon, which neither country has accomplished to this day.[158] A lunar base or orbiting station was a common topic in newspaper coverage of the Space Race. Dr. Thomas O. Paine, NASA administrator during the Moon landing, said missions after Apollo included multiple trips back to the Moon and projects to create civilian and military station labs in orbit.[159] Dr. Paine's predictions were not entirely incorrect; NASA became successful in the creation of Earth-orbiting space stations including SkyLab and the International Space Station.

Late Predictions (1969)

Two months before the Apollo 11 Moon Landing, former Vice President Hubert Humphrey said, "We can't stop after the Apollo programs put men on the Moon. We should be considering space laboratories and platforms. We simply can't coast after the Moon landing."[160] Humphrey's call to action was accompanied by voices with grand imaginations and expectations about space exploration. Many people saw the Space Race as an opportunity to dream and conspire about what was in outer space and how humans would conquer the great unknown.

Marjorie Hunter, *Houston Chronicle* journalist, reported on congressional leaders' discussions about the future of space exploration three days after the Apollo 11 launch. Her article revealed mixed opinions about the priority of space efforts. A Democratic representative from Montana, Mikes Mansfield, believed problems on Earth should override the space program after the Moon landing.[161] Sen. Edward M. Kennedy echoed these sentiments by calling for more attention to war, poverty, and hunger. Rep. Hale Boggs held conflicting views stating, "The

[158] Associated Press, "Russian A-Bomb Satellites Feared: Congressional Experts Cite Psychological Value," *Houston Chronicle,* April 13, 1961.

[159] United Press International, "Russia May Beat U.S. To Planets- NASA Head," *Houston Chronicle*, May 19, 1969.

[160] Charlie Wadsworth, "Humphrey Center Of Attraction," *Orlando Sentinel*, May 19, 1969.

[161] Marjorie Hunter, "Where After Moon? Dem Leaders Split," *Houston Chronicle*, July 17, 1969.

amount to be learned from the voyages beyond the Earth is enormous, and the cost of the program is already being repaid in advances in medicine, satellite communication, and technological progress."[162] Boggs believed the Apollo program was only the beginning of NASA's achievements, and his predictions were mainly correct. Fifty years after the Moon landing, NASA's budget for 2019 was around $20 million.[163] This money was poured into projects such as the International Space Station, the Space Launch System (the new rocket that will return astronauts to the Moon), the Hubble Telescope, and robots on Mars.[164] These massive projects have contributed innovative solutions for space exploration and life on Earth including all of the categories Boggs mentioned.[165]

Boggs also advocated for the development of a Moon colony and manned flights to Mars. Boggs said, "I would hope the competitive spirit that has brought war and turmoil to Earth could now be turned to exploring the planets."[166] In response to claims the Moon landing was purely show business, Boggs stated: "Today we saw the most fantastic achievement in history. If that be show business, let's have some more."[167]

The discussions among these congressional leaders were representative of conversations present throughout the local papers.[168] Individuals from every corner of society were dreaming

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[162] Ibid.

[163] "NASA FY 19 Budget Estimates," National Aeronautics and Space Administration, https://www.nasa.gov/sites/default/files/atoms/files/fy19_nasa_budget_estimates.pdf.

[164] Ibid.

[165] Daniel Coleman, Mike DiCicco, Naomi Seck, and John Jones, *NASA's Spinoff 2019* (Greenbelt, Maryland, Goddard Space Flight Center: National Aeronautics and Space Administration, 2019).

[166] Jack Cleveland, "Boggs Defends U.S. Effort To Explore Space," *Houston Chronicle*, July 17, 1969.

[167] Ibid.

[168] Topics such as Earth-applicable technology, lunar bases, economic issues were discussed in the following articles: "To Make Unification Work Apollo Flies Path Of Dreams," *Orlando Sentinel,* July 17, 1969; Bob Ford, "'77 Target Date Bared By NASA," *Orlando Sentinel,* July 25, 1969; Associated Press, "Russian A-Bomb Satellites Feared: Congressional Experts Cite Psychological Value," *Houston Chronicle*, April 13, 1961; Charlie Wadsworth, "Humphrey Center Of Attraction," *Orlando Sentinel*, May 19, 1969; Frances Bensinger, "Taking Care Of Widows Important As The Moon," *Orlando Sentinel*, July 25, 1969.

about what the future may hold for space exploration. The Space Race triggered a sense of wonder in the American people, and this was made obvious through the discussions and hopes portrayed in the news.

Space stations and a lunar base

Space stations and lunar bases were mentioned multiple times in the local papers during the Space Race. Tom Tiede, a correspondent for the National Education Association, wrote an in-depth article covering the plans for a space station project and explained, "According to von Braun, the next thing is an orbiting manned workshop, which can be alternately lived in and abandoned by relaying teams of astronauts."[169] Tiede highlighted the benefits of the workshop:

> Scientists predict that not only will solar knowledge be increased (such as perhaps, new data on the origin of earth) but that commercial use will be made of orbiting stations. They predict one day, civilian industries will have branches circling the globe and new products, new markets and new profits will be created 100-300 miles straight up.[170]

Tiede also explained how astronauts would adjust to living in microgravity by using things such as seat-belts on toilets and "suctionalized" razors.[171] In an *Orlando Sentinel* article, Bob Ford reported the billion-dollar program "would contribute to phenomenal growth for the Cape Kennedy area and would provide the means for future manned ventures to the planets and eventually the stars."[172] Ford explained the station would contribute valuable research on the effect of space on the human body, as well as act as a checkpoint for future trips to other planets or the Moon.[173]

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[169] Tom Tiede, "Space Workshop Worth Weightlessness In Gold," *Orlando Sentinel,* December 22, 1968.
[170] Ibid.
[171] Ibid.
[172] Bob Ford, "'77 Target Date Bared By NASA," *Orlando Sentinel,* July 25, 1969.
[173] Ibid.

All of these predictions, including the strapped toilet seats, were correct and in 1973 Skylab became the first U.S. Space Station. The station orbited Earth until 1979 and included a workshop, solar observatory, multiple docking adapters and life support systems to allow three crew members to spend up to 84 days in space.[174] Astronauts on Skylab contributed to the research journalists had described: biomedical and life sciences, Earth observations, solar astronomy, materials processing, and most importantly the effects of long-term missions on the human body.[175]

The International Space Station became the superior project after Skylab. The first piece of the ISS was launched in 1988, the first crew arrived in October of 2000, and it's still an ongoing and major part of space exploration today.[176] In a suprising turn from the Space Race, fifteen countries worked together to build and manage the orbiting station, and the United States and Russia are two of the major partners for this enormous project.[177] The ISS is a prime example of successful international cooperation, and the station has resulted in invaluable developments vital to NASA's goals for the future.[178] It's fascinating to evaluate how the relationship between The United States and Russia has evolved since the Space Race. Very little to no journalists predicted that the two competitors would one day create the International Space Station in such positive collaboration. The two countries were pitted against each other during the Space Race and were fearful of each other's influence. While some newspaper coverage

[174] Brian Dunbar, "Skylab: America's First Space Station," National Aeronautics and Space Administration, May 14, 2018, https://www.nasa.gov/feature/skylab-america-s-first-space-station.

[175] Ibid.

[176] Brian Dunbar, "What Is the International Space Station?," National Aeronautics and Space Administration, November 30, 2011, https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-the-iss-k4.html.

[177] Mark Garcia, "International Cooperation," February 28, 2019, https://www.nasa.gov/mission_pages/station/cooperation/index.html.

[178] Brian Dunbar, "What Is the International Space Station," National Aeronautics and Space Administration, November 30, 2011, https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-the-iss-k4.html.

during the Space Race advocated for cooperation and peace, it was hard for people to predict the political evolution that would form the current American and Russian relationship. In addition, just as scientists predicted in 1968, commercial companies such as Boeing and SpaceX have contributed crucial technology and spacecrafts to the ISS.[179]

Another frequent topic was the creation of a lunar base or permanent structure on the Moon. An article published in the *Orlando Sentinel* imagined what a presidential campaign would include if a Moon base existed. Paul Hope, writer of the creative article, pictured President Nixon boarding his presidential rocket ship, Moon 1, and being told to "not call anyone a fat green Moon man."[180] Hope's article was accompanied by brief mentions of the formation of a lunar base or Moon-orbiting station in other articles.[181] Immediately after the Space Race the focus turned to Skylab and the ISS, so these predictions were not correct about America's space exploration's timeline.

Predictions about the Moon

It was particularly difficult for scientists to predict the Moon's terrain. A 1965 Associated Press article published in the *Houston Chronicle* explained, "The Moons' surface probably is a loose layer of fine, sand-like material. The stuff is at least 10 feet and possibly 'meters' deep."[182] NASA scientists predicted the surface could withstand a soft-landing, in other words the Apollo

[179] "Laboratory, Proving Ground, Home," Boeing, https://www.boeing.com/space/international-space-station/; Kathryn Hambleton, Courtney Beasley, "SpaceX Dragon Heads to Space Station with NASA Science, Cargo," National Aeronautics and Space Administration, December 5, 2019, https://www.nasa.gov/press-release/spacex-dragon-heads-to-space-station-with-nasa-science-cargo-0.

[180] Paul Hope, "Plans for '72 Moon Campaign Have Familiar Ring," *Orlando Sentinel*, July 21, 1969.

[181] Lunar bases or stations are mentioned in these articles: Bob Ford, "'77 Target Date Bared By NASA," *Orlando Sentinel,* July 25, 1969; Associated Press, "Russian A-Bomb Satellites Feared: Congressional Experts Cite Psychological Value," *Houston Chronicle*, April 13, 1961; Charlie Wadsworth, "Humphrey Center Of Attraction," *Orlando Sentinel*, May 19, 1969.

[182] Associated Press, "No Trouble Expected With Moon Landing," *Houston Chronicle,* December 16, 1965.

spacecraft could safely touch down on the Moon.[183] The Surveyor probe was the first American spacecraft to softly land on the Moon and demonstrated that the Moon's surface could support a human spacecraft.[184] An article in the *Houston Chronicle* explained that Surveyor was "capable of photographing granular particles with diameters down to one-tenth of an inch."[185] After NASA concluded humans could land on the Moon without "vanishing into a choking sea of dust," Walter Sullivan, reporter for the *Houston Chronicle,* believed there was still no proof that men could successfully walk on the Moon. Sullivan explained that Luna-9, a Soviet spacecraft, would contribute additional evidence to address this concern. Scientists also expected Luna-9 to be instrumental in future landings on Mars, asteroids and other celestial bodies.[186] The Space Race's coverage often dreamed about future space endeavors such as missions to Mars and other locations in space, which will be discussed later.

Another article in the *Houston Chronicle* explained Luna-9 would reveal information on the Moon's age, origin and the possibility of primitive life forms.[187] *Huntsville Times* reporter Victor Cohn expressed doubts about Moon exploration because of the unknowns: "He (men) can't say whether it (The Moon) is partly wet or completely dry beneath the surface; or very hot or totally cold inside; or volcanic or geologically living, a place still in formation to some extent, like the earth - or completely dead, a finished ball of rock."[188] While scientists could make educated guesses about the Moon's environment, exact characteristics and information about its history could not be proven until humans arrived.

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[183] Ibid.

[184] David R. Williams, "Surveyor (1966-1968)," National Aeronautics and Space Administration, https://nss dc.gsfc.nasa.gov/planetary/lunar/surveyor.html.

[185] Associated Press, "No Trouble Expected With Moon Landing," *Houston Chronicle,* December 16, 1965.

[186] Walter Sullivan, "Moon Landing Envisions Assault on Solar System," *Houston Chronicle*, February 4, 1966.

[187] "Luna Sends Historic Data Back to Russia," *Houston Chronicle*, February 4, 1966.

[188] Victor Cohn, "Of What Possible Value Is Exploring the Moon?," *Huntsville Times,* December 22, 1968.

Predictions about the Moon exposed the anxieties about sending men into the unknown – what was it like on the surface of a desolate celestial body, was it actually desolate, where did the Moon come from? Through the Surveyor, Luna, and Apollo programs, the surface of the Moon was found to be dusty and rocky with no sign of life, but strong enough for human exploration.[189] In 2009, NASA learned the Moon contains millions of tons of water ice, which could be extracted during future missions.[190] The answers or theories associated with questions that were published in the newspapers tended to be realistic and informed. However, the coverage become more imaginative when it discussed the prospect of exploring Mars.

Exploring the Solar System

Before setting foot on the Moon, people dreamed about going to Mars. Similar to the Moon landing, newspaper articles revealed the U.S. believed the Russians were not far behind the Americans.[191] Wernher von Braun advocated for exploration of the Red Planet and predicted that men would reach Mars by 1985, while other scientists predicted they would send spacecrafts by 1964.[192] Von Braun's prediction proved to be overzealous, while the scientists were more accurate. On July 14, 1965, NASA's Mariner 4 spacecraft conducted a flyover of Mars and took the first "close-up" photographs of another planet.[193] It wasn't until 1976 that NASA's Viking project became the first successful soft-landing on Mars.[194]

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[189] Molly Wasser, "Observe the Moon: Viewing Guide," NASA Science: Earth's Moon, https://moon.nasa .gov/observe-the-moon/viewing-guide/what-can-i-see-on-the-moon/.

[190] "We Are Going," National Aeronautics and Space Administration's YouTube account, May 4, 2019, https://www.youtube .com/watch?v=vl6jn-DdafM&feature=emb_title.

[191] Associated Press, "Mars Seems Next Target for Reds," *Huntsville Times*, October 13, 1964; Associated Press, "Red May Shoot For Mars Next," *Houston Chronicle*, October 13, 1964.

[192] Tom Tiede, "Space Workshop Worth Weightlessness In Gold," *Orlando Sentinel*, December 22, 1968; Associated Press, "Mariner II Takes Look At Venus," *Orlando Sentinel*, December 15, 1962.

[193] "NASA: Missons to Mars," National Aeronautics and Space Administration, February 15, 2006, https:// www.nasa.gov/mission_pages/mars/missions/mariner3-4-index.html.

[194] Brian Dunbar, "Mars Exploration: Past Missions," National Aeronautics and Space Administration, March, 7, 2019, https://www.nasa.gov/mission_pages/mars/missions/index-past.html.

Huntsville Times reporter Jack Hartsfield wrote that President Nixon's chief science advisor publicly contended "that under U.S. current tech know-how, planning of Mars exploration should not even begin for another 20 years."[195] Congressional leaders also believed Mars exploration was not a priority for America. In another *Huntsville Times* article reporter Jack Bell explained, "The Senate's two leading Democrats say any U.S. effort to put a man on Mars by the end of the century should take a back seat to a national commitment aimed at meeting the earthly needs of the world."[196] However, the feasibility of the journey to Mars did not stop predictions from being published in the local papers.

Journalist Gene Bylinksy went into great detail about the logistics and challenges of a Mars landing. He predicted that the Mars ship would be assembled in Earth orbit, the crew would consist of 4 people, and there would be animals such as live fish to aid in research on the effect of space travel on living creatures. Bylinksy mentioned many challenges including: boredom and loneliness during the long trip to the Red planet, spacecraft maintenance that could require astronauts to work outside the ship, safety systems such as tethers, finding the best entertainment activities for astronauts, knowing where to land on Mars, and maintaining reliable communication equipment. He also mentioned emotional issues due to extended confinement and the threat of personalities/egos clashing.[197] All of these concerns are still being addressed by NASA today.

After Mariner 4 took the first photos of Mars, Arthur Hill, journalist for the *Houston Chronicle,* said it was too early to make conclusions, but Mars apparently had "no surrounding

[195] Jack Hartsfield, "Mars Landing Is Next Goal," *Huntsville Times*, July 17, 1969.
[196] Jack Bell, "Senate Chiefs Discount Mars," *Huntsville Times,* July 17, 1969.
[197] Gene Bylinksy, "Mars Expedition II: Mission Hazards Will Be Difficult," *Huntsville Times*, June 16, 1963.

belt of trapped radiation that might prove hazardous to future astronauts."[198] A NASA spokesperson also explained "there was little or no chance that Mariner 4 could tell if life existed on Mars. The answer to that must wait until 1971."[199]

Mars was not the only planet getting Space Race coverage; multiple journalists covered the efforts of NASA and the Soviet Union to explore Earth's other neighboring planet, Venus. One *Houston Chronicle* cartoon had a man pointing binoculars at Venus's door and asking, "Yoo Hoo Anybody Home? And I hope you are friendly" (see Figure 5). Many scientists doubted that life could exist on Venus, but the spacecraft Mariner 2 was going to "unravel secrets concealed by the planet's constant cloud layers."[200] The *Houston Chronicle* claimed the information from Mariner 2 was "vital to astronauts of the future who will reconnoiter Venus in manned spacecrafts."[201] The *Orlando Sentinel* also considered missions to Venus, Jupiter and Saturn.[202] Neither NASA nor the Soviet Union have sent manned spacecrafts in the direction of Venus, but advanced unmanned vessels and telescopes have been exploring all of the planets in the Earth's solar system.

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[198] Arthur Hill, "Mariner-4 Sending Mars Photos: Too Early To Tell Quality," *Houston Chronicle*, July 15, 1965.

[199] Ibid.

[200] Associated Press, "Shot at Venus Now Depends On Tiny Motor," *Houston Chronicle*, August 28, 1962.

[201] United Press International, "Venus Probe Slips Victorious Into Eternity," *Houston Chronicle,* September 13, 1962.

[202] "Greatest Voyage Of Mankind Ends For Apollo 11 Astronauts," *Orlando Sentinel*, July 25, 1969.

Figure 5. Ferman Martin, "Where There Might Be Life," *Houston Chronicle,* August 28, 1962.[203]

Von Braun's revolutionary predictions and impact on the Space Race

One significant person involved in the Space Race was Wernher von Braun, a German aerospace engineer and space architect.[204] He was instrumental in the design of multiple rockets and was the primary architect of Saturn V, the rocket used in the Apollo Program. Von Braun had a controversial past, as he joined the Nazi party during World War II; however, the prevalent belief was that his affiliation reflected his desire to continue rocket research rather than support the goals of the Nazi regime.[205] Regardless of von Braun's genuine moral compass, he was well received by the United States after he began working for NASA at the Marshall Space Flight Center in Huntsville.

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[203] Ferman Martin, "Where There Might Be Life," *Houston Chronicle,* August 28, 1962.

[204] Brian Dunbar, "Biography of Wernher von Braun," National Aeronautics and Space Administration, August 3, 2017, https://www.nasa.gov/centers/marshall/history/vonbraun/bio.html.

[205] Michael J. Neufeld, *Von Braun: Dreamer of Space, Engineer of War,* New York: Alfred A. Knopf, 2007, https://search.ebscohost.com/login.aspx?direct=true&db=cat00456a&AN=ua.2195147&site=eds-live&scope=site.

Von Braun was a seemingly fearless visionary who proposed ideas about the future of space across American media, including in magazines such as *Collier's*, television such as *Disneyland* episodes, and local papers.[206] The day after the Moon landing, *Huntsville Times reporter* Bob Ward highlighted von Braun's contribution to space exploration and Huntsville. Ward explained von Braun had "more than any other man, shepherded from fantasy to reality – space travel -whose time he always knew was coming."[207] Ward fondly described von Braun's "genius" personality and ability to develop and sell spaceflight:

> He has been the genius of leadership, of inspiration to those around him, of technical management, of pragmatism in biding his time when that became the prudent thing to do, and of super – salesmanship when that was called for. Few will argue that von Braun qualifies as complete spaceman. He uniquely – and somewhat incredibly- combines broad and deep technical knowledge with management sills, political savvy with the ability to charm, imagination with realism, appreciation of the big picture with attention to detail, dedication to a goal with energy to pursue it vigorously throughout a lifetime.[208]

Von Braun returned the kind words by claiming, "Without Huntsvillians there would be no man on the Moon."[209]

Huntsville Times reporter Jack Hartsfield, reported that von Braun initially favored a "monster" space vessel over the final version of Saturn V.[210] Other scientists piggy-backed off of von Braun's idea and proposed another plan for the Moon landing: to first send building supplies to the Moon and have astronauts build their return rocket home after they arrived on a separate vessel.[211] At the time of the Space Race, this idea was exceptionally implausible. NASA and the Soviets were still conducting research on how space affected the human body, therefore it would

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[206] Brian Dunbar, "Biography of Wernher von Braun," National Aeronautics and Space Administration, August 3, 2017, https://www.nasa.gov/centers/marshall/history/vonbraun/bio.html.

[207] Bob Ward, "The Genius of Wernher von Braun - Durable Catalyst of Dreams and Deeds," *Huntsville Times*, July 21, 1969.

[208] Ibid.

[209] Von Braun is Relaxed," *Huntsville Times,* July 21, 1969.

[210] Jack Hartsfield, "Von Braun Happy He's Wrong About Reliability of Lander," *Huntsville Times*, July 17, 1969.

[211] Ibid.

have been a tremendous risk to require astronauts to exert enough energy to construct a rocket on the surface of the Moon.

According to Hartsfield, it took some time to convince von Braun to support the rendezvous plan for the Moon landing.[212] During the Space Race, scientists debated about the logistics of sending men into space, onto the Moon, and then returning them back to Earth. Von Braun supported a "one-package" use of Saturn V, meaning the rocket would remain as one large vessel for the entirety of the journey.[213] Scientists ultimately decided on a lunar rendezvous: put simply, the Saturn V contained three stages that fired and fell off at separate times.[214] Saturn V would launch men into Earth's orbit, boost them out of orbit and into the Moon's orbit using these stages. The lunar lander would detach from the orbiting command module, land on the Moon and then boost back to the command module, which was also the return-vessel back to Earth.[215]

There were many risks involved in this plan, but there were also benefits such as requiring less fuel and time to reach the Moon.[216] According to NASA, a giant rocket was not conducive for the timetable set by the late President Kennedy.[217] NASA engineer Dr. John Houbolt was the main advocate for the lunar rendezvous. Hartsfield reported that it took until 1969 for "Houbolt to get his well-deserved credit with von Braun, once his arch – adversary,

[212] Jack Hartsfield, "Von Braun Happy He's Wrong About Reliability of Lander," *Huntsville Times*, July 17, 1969.
[213] Ibid.
[214] "The Rendezvous That Was Almost Missed: Lunar Orbit Rendezvous and the Apollo Program," NASA, December 1992, https://www.nasa.gov/centers/langley/news/factsheets/Rendezvous.html.
[215] Ibid.
[216] Ibid.
[217] Ibid.

praising him for his stubbornness."[218] According to Hartsfield's article, von Braun was also one of many people who thought the lunar lander was "flimsy" and "frail" (see Figure 6). [219]

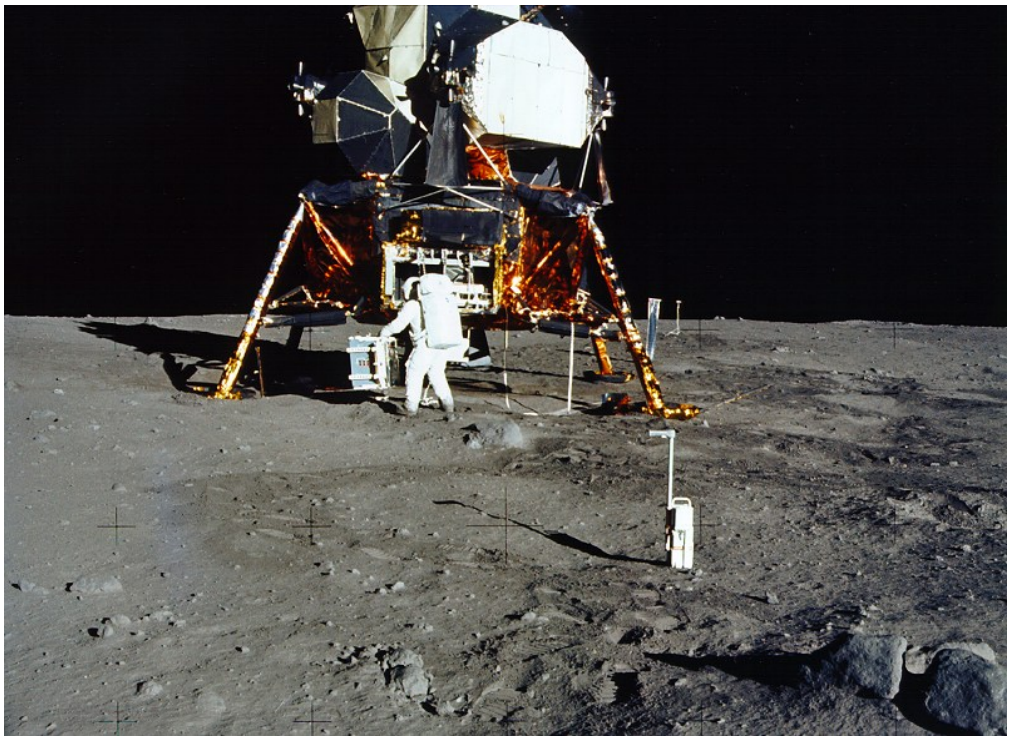

Figure 6. Image of the Lunar Lander used in Apollo 11.[220]

The lunar lander was certainly disappointing compared to space vessels portrayed in popular media before the Moon landing such as cover pictures from *The Magazine of Fantasy and Science Fiction* and spacecrafts imagined in television episodes from Looney Tunes and Disney.[221] The spacecrafts depicted in these magazines and episodes looked much larger and more futuristic than what NASA had designed. Hartsfield described the actual lander as an

[218] Jack Hartsfield, "Von Braun Happy He's Wrong About Reliability of Lander," *Huntsville Times*, July 17, 1969.

[219] Ibid.

[220] National Aeronautics and Space Administration, *Aldrin Unpacks Experiments,* 1969, photograph, accessed February 16, 2020, https://history.nasa.gov/ap11ann/kippsphotos/apollo.html.

[221] Various covers from The Magazine of Fantasy and Science Fiction, 1950-1958, see covers in Figure 9 in appendix; "Haredevil Hare," directed by Charles M. Jones, *Looney Tunes,* aired July 24, 1948, accessed from https://www .dailymotion.com/video/x2fbylh.;"Man and The Moon," Disneyland, aired December 28, 1955, accessed from https://www.youtube.com/watch?v =1ZImSTxbglI; "Man In Space," Disneyland, aired March 9, 1955, accessed from https://www.youtube.com /watch?v=omWRxonewL4; "Mars and Beyond," Disneyland, aired December 4, 1957, accessed from https://www .youtube.com/watch?v=E0sbqqYo97s.

"awkward looking, lopsided craft with spidery legs."[222] Von Braun also envisioned a more magnificent rocket and lunar lander, but ultimately admitted he was "happy he was wrong" about the underwhelming reality.[223] If NASA has pushed for more visually pleasing rockets and command modules, America would not have achieved a moon landing by 1969, according to Hartsfield's reports.[224]

Von Braun had many public discussions about the future of space exploration. For example, in May of 1969 von Braun said, "the day is fast approaching when climbing aboard rockets will be as safe as getting aboard a jet-liner."[225] The Apollo 1 disaster was the only lethal accident during the Space Race; it seemed that NASA and the Soviets had mastered safety precautions. However, space exploration remained incredibly risky. Von Braun's statement eluded to commercial spaceflight, which was mentioned during the Apollo era. According to an article from the *Orlando Sentinel,* Trans World Airlines (TWA) applied for government permission to operate a commercial passenger service to the Moon.[226] However, TWA never followed through with this project.

Nuclear propulsion

The use of nuclear propulsion was mentioned multiple times in Space Race news coverage and predictions. One of the earliest mentions of nuclear power in the local papers came from an Associated Press article published in the *Houston Chronicle.* In 1957 Dr. S. Fred Singer,

[222] Jack Hartsfield, "Von Braun Happy He's Wrong About Reliability of Lander," *Huntsville Times*, July 17, 1969.

[223] Ibid.

[224] Ibid.

[225] B.J Richey, "MSFC's Baby Is Getting Better With Each Shot Into Heavens," *Huntsville Times*, May 19, 1969.

[226] "TWA Applies For Moon Run," *Orlando Sentinel*, July 25, 1969.

associate professor of physics at the University of Maryland, declared "the United States could explode an H-bomb rocket on the Moon right now and the administrative decisions kept American from beating Russia to the launching of Earth satellites."[227]

In 1961, John F. Kennedy addressed congress about the space program and also requested funds for nuclear rocket propulsion research. [228] By 1967, NASA had run a successful test of a nuclear engine under the Nuclear Engine for Rocket Vehicle Application (NERVA) project.[229] One of NERVA's main purposes was to create engines for Mars missions because nuclear energy is more efficient and powerful. Von Braun was a staunch advocate for nuclear rockets, which probably explains his prediction to send men to Mars by 1981.

Singer's aggressive statement in 1957 may have stemmed from frustration with NASA's decision to cut back on the NERVA project. According to NASA, "shifting priorities, political winds and space budget cutbacks led to curtailment of NASA's nuclear propulsion work at the end of 1972."[230] The word "nuclear" had many negative connotations considering the Cold War was clouded with fears of violent uses of missiles and bombs. The Outer Space Treaty of 1967 included a ban on the use of space for nuclear weapons testing. [231]

Regardless of politics, nuclear propulsion discussions made their way into the newspapers. An *Orlando Sentinel* article explained, "some scientists believe that the power locked in the atom contains the best answer to the problem for space travel." [232] An Associated

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[227] Associated Press, "U.S. Could Reach Moon Now, Space Scientists Declares," *Houston Chronicle*, November 4, 1957.

[228] John F. Kennedy, "Special Message to Congress On Urgent National Needs," May 25, 1961, https://www.jfklibr ary.org/asset-viewer/archives/JFKWHA/1961/JFKWHA-032/JFKWHA-032.

[229] Pat Duggins, *Trailblazing Mars: NASA's Next Giant Leap* (Gainesville, FL: University Press of Florida, 2010), 30-33.

[230] Loura Hall, "Nuclear Thermal Propulsion: Game Changing Technology for Deep Space Exploration," National Aeronautics and Space Administration, May 25, 2018, https://www.nasa.gov/directorates/spacetech/game_changing_development/Nuclear_Thermal_Propulsion_Deep_Space_Exploration.

[231] NASA, "Outer Space Treaty of 1967," https://history.nasa.gov/1967treaty.html.

[232] Associated Press, "H-Tests May Aid in IRBM Defense," *Orlando Sentinel,* February 1, 1958.

Press article published in the *Huntsville Times* featured von Braun's support for nuclear propulsion and claimed he did not consider space hostile, but saw hazards "just as there is a danger for man on Earth if he walks off a cliff."[233] Von Braun also emphasized that "fear and superstition feed on the unknown."[234] Predictions about nuclear propulsion were correct and NASA has used and plans to continue to harvest the power of nuclear energy.

While some predictions found in local papers were incorrect, such as those that stated the Soviets would quickly arrive to the Moon after Sputnik I and that humans would reach Mars by the 1980s, many of the direct predictions were correct and foreshadowed the events of the Space Race and today's space efforts. The predictions demonstrated concerns over the environment of space and other heavenly bodies and hopes for the long-term presence of humans in outer space. Predictions published in the papers were often informed by experts which may explain their accuracy. The amount of correct predictions suggests that present news coverage could give a legitimate glimpse into the future.

[233] Associated Press, "Nuclear Space Flight Near, Von Braun," *Huntsville Times,* October 13, 1964.
[234] Ibid.

CHAPTER 5: THE IMPORTANCE OF EXAMINING SPACE PREDICTIONS IN NEWSPAPERS: THE INFORMED IMAGINATION

This study revealed journalists, scientists, space experts, NASA personnel, global leaders, and activists made a variety of predictions about outer space during the first legitimate efforts to explore the "final frontier." The predictions found in this study revealed what people desired, imagined, and worried about for the Space Race and future of space exploration. In *Imagining Outer Space,* Alexander Geppert claimed imagination encouraged technological advancements and contributed to the success of human space exploration:

> …McCurdy and Roger Launius have shown how the imagery of space, from Buck Rogers and Flash Gordon to the art of Chesley Bonestell and real images beamed from outer space, have inspired the imagination and had a real effect on public and scientific interest in space. In a broader sense Harvard historian of science Gerald Holton has shown how the imagination of the scientist, rather than objective criteria, is often important in the early stages of a scientific idea. In short, imagination is not to be trifled with, but constitutes a real force with real-life consequences.[235]

The act of predicting and imagining are significantly similar. The Merriam-Webster Dictionary defines imagination as "the act or power of forming a mental image of something not present to the senses or never before wholly perceived in reality."[236] Predicting is defined as "declaring or indicating in advance, especially foretelling on the basis of observation, experience, or scientific reason."[237] The main difference between predicting and imagining is the use of evidence in the forecast. Newspaper articles are typically built around direct quotes and

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[235] Alexander Geppert, *Imagining Outer Space: European Astroculture in the Twentieth Century*. (London: Springer Nature, 2012), 35.

[236] *Merriam-Webster.com Dictionary*, s.v. "imagination," accessed February 9, 2020, https://www.merriam-webster.com/dictionary/imagination.

[237] *Merriam-Webster.com Dictionary*, s.v. "predict," accessed February 9, 2020, https://www.merriam-webster.com/dictionary/predict.

attribution, and American journalism's most foundational value is truth-seeking.[238] Therefore, predictions published in newspapers stem from legitimate information as opposed to predictions found in non-fiction media where imagination is employed. However, it is important to employ a critical lens when examining newspapers. Journalists and sources are imperfect and driven by individual motives, a fact revealed in some of America's most well-known media scandals and misleading coverage.[239] Nonetheless, newspaper coverage gives a closer glimpse into reality as opposed to science-fiction.

In *Space and The American Imagination,* McCurdy claimed, "Stories fiction and true dealing with space exploration are among the most widely consumed in American culture."[240] It's imperative to remember that during the Space Race, the United States was also navigating numerous other significant events. "Americans had plenty to occupy their attention in 1969 – civil rights, the plight of the poor, an increasingly unpopular war in southeast Asia, rising federal deficits, and growing concern for the preservation of a livable environment – and plenty of advocates for every cause clamoring for action."[241] In the midst of these historical events, the Space Race stayed a relevant topic in news coverage.

The topic of outer-space has proven to captivate audiences around the world, and it has never been more relevant than it is today with active exploration and creation of space technology. The current goals of NASA, other country's space programs, and commercial space companies are common topics in America's news outlets and will continue to circulate.

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[238] Society of Professional Journalists, "SPJ Code of Ethics," https://www.spj.org/ethicscode.asp.

[239] W. Joseph Campbell, *Getting It Wrong: Ten of The Greatest Misrepresented Stories in American Journalism,* (Berkeley, CA: University of California Press, 2010).

[240] Howard E. McCurdy, *Space and The American Imagination*, (Baltimore, MD: John Hopkins Press, 2011), 7.

[241] William David Compton, *Where No Man Has Gone Before, A History of Apollo Lunar Exploration Missions*: NASA History Series (Washington D.C.: National Aeronautics and Space Administration Office of Management, Scientific and Technical Information Division, 1989), 270.

Addressing the political undertones

It is virtually impossible to ignore the American bias and patriotism that underlined most of the Space Race's coverage. Geppert emphasized that the world is not united in the reasons for exploring outer space: "In the end we must also realize that the impact of space exploration on our world view will also vary according to individuals and cultures – coming back now full circle to that problematic term 'culture' and the relation of the individual imagination to it."[242] The first theme discussed in this study was the struggle between celebrating the incredible achievements of the U.S. and Soviet space programs versus highlighting the political and potentially threatening nature of these achievements. After all, the Space Race was exactly as the name implies, a competition, but not an ordinary contest, one between two world powers with stark differences and deep-rooted history.

Scholars who study this era discuss the bias and patriotism that was present during this time. John Noble Wilford, a Pulitzer Prize winning journalist and reporter for the *New York Times* and *Wall Street Journal*, explained:

> The initial driving force for a strong American space program was not scientific, economic, or romantic, but political - the pursuit of national prestige and power by a new means and in a new frontier. This no doubt accelerated the development of spaceflight capabilities and the attainment of high-visibility goals, but it contributed eventually to a serious mid-life crisis for the American space effort.[243]

In *Selling Outer Space,* Kauffman also recognized the political bias that bled into American journalism during the Space Race and said, "One cannot overlook the natural tendency of American journalists to root for the home team while in the midst of a propaganda race with the

[242] Alexander Geppert, *Imagining Outer Space: European Astroculture in the Twentieth Century,* (London: Springer Nature, 2012),

[243] Alex Roland, *A Spacefaring People: Perspectives on Early Spaceflight,* (Washington D.C.: U.S. Government Printing Office, 1985*),* 70*,* https://history.nasa.gov/SP-4405.pdf.

Soviets."[244] Even though important figures such as von Braun proclaimed, "space is not a program but a place,"[245] newspaper coverage constantly reminded the American people of the political and economic implications of NASA.

Newspapers were not immune to American propaganda as evident in articles examined in this study. Journalists and other voices featured in these articles willingly shared their fear, embarrassment, anxieties, and doubts about space exploration. The Soviet Union was often portrayed as untrustworthy and their accomplishments were downplayed. Journalistic reporting on the Space Race raises the question of whether objective reporting is possible or if it is or unrealistic.[246] Lois A. Boynton, professor at The University of North Carolina, stated, "Objectivity is best known by its characteristics – fairness, balance, factual accuracy, neutrality, impartiality and detachment."[247] The articles in this study lacked most of the characteristics of objective reporting. Regardless of opinions on the importance of objectivity, the Space Race was defined by biased reporting and obvious attempts to frame the milestones in a pro-U.S. fashion. It is important to identify these attitudes because it reveals how American journalism covered a pivotal moment in history and attempted to mold the public's understanding and opinions about space exploration. Kaufmann argued that Space Race news coverage played a significant role in shaping public perception as news frames directly affect how people understand important events.[248]

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[244] James Lee Kauffman, *Selling Outer Space: Kennedy, the Media, and Funding for Project Apollo* (University of Alabama Press: Tuscaloosa, AL, 1994), 66.

[245] Bill Austin, "Outer Space Hold Military Importance," *Huntsville Times*, September 13, 1962.

[246] Lois A. Boynton, "Objectivity – Ideal or Unreal," in *Media Issues, Point/Counterpoint,* ed. Jennifer D. Greer and Wm. David Sloan, (Northport, AL: Vision Press, 2013).

[247] Lois A. Boynton, "Objectivity – Ideal or Unreal," in *Media Issues, Point/Counterpoint,* ed. Jennifer D. Greer and Wm. David Sloan, (Northport, AL: Vision Press, 2013), 159.

[248] Robert M. Enthman, "Framing: Towards clarification of a fractured paradigm," *Journal of Communication* 43, no. 4 (1993): 51-58; Sophie Lecheler and C.H. de Vreese, 2019, *News Framing Effects: Theory and Practice.* Milton Park, Abingdon Oxon Routledge; Dhavan V. Shah, Nojin Kwak, Mike Schmierbach and Jessica Zubric, "The interplay of news frames on cognitive complexity," *Human Communication Research* 30, no. 1

News outlets today can evaluate their ethics and choose values based on an evaluation of the past. Studying history in any capacity is invaluable for multiple reasons; history fosters a better understanding of the behaviors, social-issues, ethics, morals, and identities of societies and individuals.[249] NASA is preparing for another massive step forward in human space exploration as the Artemis program will take humans back to the Moon and eventually onto the Red Planet. Inevitably, the Artemis missions and their progress will be a featured topic in the news. If NASA fulfills its promise to return to the Moon by 2024, could the media start to resemble coverage from the 1950s and 60s? Wilford offered an interesting comparison of the Space Race and colonization of the Americas:

> So, while we consider and perhaps deplore some of the reasons we went into space in the beginning, it is well to remember that geopolitics was the impetus for the rivalry between England and Spain during the age of seafaring exploration. You know what that produced. So, may it be for the age of spacefaring exploration.[250]

This comparison shows the repetitive nature of the history of exploration and as humans venture to Mars there might be similar competitive, fearful and tense occurrences.

Similar to the Space Race, NASA's new Artemis Program and Moon to Mars initiative have political motivations and join a long of list of current events including: a chronically unstable Middle East, a controversial U.S. President, climate-change, and gender-equality movements. NASA plans to tackle some of these issues with the future of space exploration; the agency has made it very clear that women will be on the first missions back to the Moon, and

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(2004): 102– 120; Dietram A. Scheufele, "Framing as a theory of media effects," *Journal of Communication* 49, no. 1 (1999): 103-122; James Lee Kauffman, *Selling Outer Space: Kennedy, the Media, and Funding for Project Apollo* (University of Alabama Press: Tuscaloosa, AL, 1994), 66.

[249] Peter N. Stearns, "Why Study History (1998)," American Historical Association, https://www.historians.org/about-aha-and-membership/aha-history-and-archives/historical-archives/why-study-history-(1998).

[250] Alex Roland, *A Spacefaring People: Perspectives on Early Spaceflight, (Washington D.C.: U.S. Government Printing Office, 1985), 73,* https://history.nasa.gov/SP-4405.pdf.

there should be more of them trained to so as women are now encouraged to go into STEM (science, technology, engineering, and math) fields.

In addition, NASA is working to provide valuable information to solve issues related to climate-change and implement sustainable technology and methods for current space exploration objectives.[251] NASA claims, "Sustainable systems for water recycling, waste management, and solar energy generation lower the cost of space exploration but also advance "green" efforts here on Earth."[252] The International Space Station uses state-of-the-art technology to convert astronauts' urine, breath, and sweat into vital resources such as drinkable water and oxygen.[253] The Centennial Challenges Program has asked the public to help NASA create other sustainable technology including a 3D-Printing system that can use Martian resources and astronauts' recyclables to build a habitat.[254] The program is also currently running a challenge that asks participants to discover how to convert CO2 into glucose, which can then be used to make resources such as food and medicine.[255] It will be interesting to observe how NASA, the media, and the general public communicate their thoughts on climate change and space exploration.

Through identifying biases and cultural aspects of news coverage during the Space Race, journalists today can ensure they are educating the public on reality rather than political agendas. Simultaneously, identifying and explaining cultural bias can foster media literacy among the

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[251] John Olsen and Douglas Craig, "Voyages: Charting the Course for Sustainable Human Space Exploration," National Aeronautics and Space Administration, https://www.nasa.gov/pdf/657307main_Exploration%20Report_508_6-4-12.pdf; Holly Shaftel, "Responding to Climate Change," National Aeronautics and Space Administration, February 11, 2020, https://climate.nasa.gov/solutions/adaptation-mitigation/.

[252] Ibid.

[253] National Aeronautics and Space Administration, "ECLSS," https://www.nasa.gov/centers/marshall/histor y/eclss.html.

[254] "NASA's 3D-Printed Habitat Challenge – Phase 3," Bradley University, https://www.bradley.edu/challenge; Brian Dunbar, "Centennial Challenges," National Aeronautics and Space Administration, November 19, 2012, https://www.nasa.gov/open/centennial-challenges.html.

[255] Jena Rowe, "Winning Teams Design Systems to Convert Carbon Dioxide into Something Sweet," National Aeronautics and Space Administration, May 16, 2019, https://www.nasa.gov/spacetech/centennial_challenges/co2challenge/winning-teams-design-systems-to-convert-carbon-dioxide-into-something-sweet.html.

general public. The Space Act of 1958, the federal statute that created NASA, included a core principle of staying open with the public.[256] NASA claims, "Openness is fostered from the organizational level to the level of individual employees. Our employees have incentives and sometimes even requirements to be open and collaborative."[257] NASA says it enables and encourages public participation through a multitude of programs, and has a diagram representing their initiatives for openness.[258]

While NASA has always touted their openness with the public, it is also important for journalists and media creators to remember that NASA is a government agency with public relations officials who are constantly crafting and guarding NASA's public image. The political bias present in the Space Race's local coverage was an attempt to set the social and political agenda and frame space exploration predictions in a certain light. Journalists are often called the watchdog of the government, and it is important that they continue this role during NASA's current initiatives.

Coleman Harwell, in a *Huntsville Times* article, wrote that space missions can be a challenge for reporters to fact-check and explain to the public.[259] Space exploration often involves intricate and complex theories, technology, and concepts. Some journalists may not have a background in science or engineering, so journalists must do adequate research on past missions, NASA's present capabilities, and the plans for the future.

Final Discussion

The examination of the *Huntsville Times, Houston Chronicle,* and *Orlando Sentinel*

[256] Veronica Phillips, "Open Government at NASA," National Aeronautics and Space Administration, August 6, 2017, https://www.nasa.gov/open/plan.

[257] Ibid.

[258] See Figure 9 in appendix.

[259] Coleman, A. Harwell, "Fast – Changing World Paces New Demands On Reporting," *Huntsville Times,* October 2, 1958.

revealed reoccurring themes in the predictions and attitudes about space during the Space Race. Each chapter of this study represents a major theme found and provides answers to the main research questions posed in the beginning of the thesis.

RQ1: What did newspapers published near major NASA Centers predict about space during the Space Race?

First, newspapers near the major NASA centers worried about the violent and political uses of outer-space travel. This reflects concerns for those living near these cities, while some world leaders advocated for peace and cooperation, others were hyper focused on America's prestige and highly suspicious of Soviet motives. However, no one predicted the strong partnership Russia and the Unites States would form in future space missions such as the ISS. Local papers also reported on critics of the space program's enormous cost and effort, and on those who predicted that invaluable technologies would evolve from the agency.

Journalists for the local papers, with the help of NASA personnel and other experts, correctly predicted that animals would prove spaceflight was possible for humans to endure. During the early years of the Space Race, journalists failed to mention the effects of long-term missions which may have mislead some to believe microgravity and confinement were not major challenges for humans to experience. However, as the Space Race progressed and predictions around Mars exploration began to appear in the papers, the challenges of long-term missions were more accurately addressed.

Local papers accurately predicted the creation of a space station and the future plans for lunar bases.. Recently, NASA announced their plan to send men and women to the Moon by 2024 through the Artemis program.[260] The massive mission includes the creation of a lunar

[260] Brian Dunbar, "Humanity's Return to The Moon," National Aeronautics and Space Administration, https://www.nasa.gov/specials/artemis/.

orbing station, called Gateway, and modern lunar landers and robotics that will allow humans to stay on the Moon for considerably longer amounts of time.[261] NASA claims that Artemis missions will be the forerunner to exploration of Mars and other celestial bodies.[262] While this initiative did not happen as quickly as some predicted during the Space Race, it has come into the main focus of NASA, commercial companies, and other government space agencies from around the world.

Today, commercial space companies are coming to the forefront of space exploration and companies such as SpaceX and Boeing are working directly with NASA.[263] The world has yet to see a commercial space trip for "normal" citizens, but visionaries such as Elon Musk, CEO of SpaceX, are preparing for a "jet-liner" space experience like those described by von Braun and Trans World Airlines.[264]

Fallen astronauts unknowingly predicted their tragic fate and drew attention to the risks associated with spaceflight. Journalists accurately recognized the challenges they would face covering complex space information. One surprising finding was the lack of religious discussions in the local papers. As mentioned in the literature review, initial discussions about space threatened the beliefs of powerful religious groups, but very few articles examined in this study mentioned religious effects. One article published in the *Orlando Sentinel* titled "Moon Conquest May Intensify Religious Unrest," predicted space exploration "could also contribute to

[261] Ibid.
[262] Ibid.
[263] "Commercial Crew Program," National Aeronautics and Space Administration, January 23, 2020, https://www.nasa.gov/exploration/commercial/crew/index.html.
[264] TWA Applies For Moon Run," *Orlando Sentinel*, July 25, 1969; "Making Life Multiplanetary," SpaceX, https://www.spacex.com/mars.; B.J Richey, "MSFC's Baby Is Getting Better With Each Shot Into Heavens," *Huntsville Times*, May 19, 1969.

the undermining of traditional authority and increase the receptivity of the man in the pew to doctrinal change."[265]

RQ2: What themes emerged in the NASA-local coverage of major events during the Space Race?

Ultimately, the main themes that developed through this study were the struggle between celebrating space exploration milestones and predicting militaristic use of outer space, the effect of space on astronauts and humans on Earth, and direct forecasts about future space technology and missions.

RQ3: How was the coverage near NASA centers similar or different to national coverage?

National papers mentioned many of the same predictions discussed in local papers such as the use of nuclear propulsion, the use of space stations, journeys to Mars, and Moon bases. However, extra-terrestrial life was surprisingly not a common topic, especially considering the vast amount of other media that hinted at life outside of Earth. Local papers and national papers occasionally mentioned extra-terrestrials, especially when discussing undiscovered planets. However, other forms of media frequently featured extra-terrestrial life and were not afraid to take on the alien angle.

There were a number of popular science-fiction magazines in America, including Hugo Gernsback's *Amazing Stories*, which carried an abundance of space-related tales. Many of the stories involded interactions between extra-terrestrials and humans.[266] Extra-terrestrial themes also emerged in popular television and film before July 20, 1969. Many films portrayed extra-

[265] *NY Times Dispatch to Sentinel*, "Moon Conquest May Intensify Religious Unrest," *Orlando Sentinel,* July 21, 1969.

[266] For example: Gerald Vance, "C'Mon-A My Planet," *Amazing Stories*, January 1952, https://archive.org/details/Am azing_Stories _v26n01_1952-01_images_/page/n127; G.L. Vanderburg, "The Observers," *Amazing Stores,* November 1959, 15-33, https://archive.org/details/Amazing_Science_Fiction_Stories_Volume_33_Number_11_/ page/n13, 30.

terrestrial life as antagonistic and unrelatable creatures. For example, in the movie *Kronos* an alien robot crashes into the ocean and begins to take all of Earth's electricity away.[267] The robot causes mass panic and devastation throughout the world. *War of the Worlds* features a similar storyline in which Martians invade Earth and kill thousands of people.[268] Even in more light-hearted television series such as *Looney Tunes,* extra-terrestrial life is inherently hostile toward Earth and its people.[269]

Disney created a "docufiction" series to gain American support for the tremendous amount of money being spent to achieve a Moon landing. Three episodes, "Man and The Moon," "Man in Space," and "Mars and Beyond," all focused on the possibilities of space exploration.[270] In "Man and The Moon," the episode described in the beginning of this study, there is short scene in which there is evidence of extra-terrestrial activity. However, the characters and narrator, Wernher von Braun, never speak of the mysterious scene.

National and local newspaper coverage mainly published realistic and informed predictions. People such as von Braun and editorials writers made more enthusiastic claims about space exploration but, overall, newspaper coverage took a more conservative route than other forms of media.

Suggestions for future research

Similar yet more imaginative themes occurred in non-news media. In order to grasp a

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[267] *Kronos,* directed by Kurt Newman, (Universal Studios, April 1957), accessed from https://archive.org/details /Kronos.

[268] *War of the Worlds,* directed by Bryon Haskin, (Paramount Pictures, August 26, 1953), accessed from https://w ww.youtube.com/watch?v=uIitWxzBXOI.

[269] "Haredevil Hare," directed by Charles M. Jones, *Looney Tunes,* aired July 24, 1948, accessed from https:// www.dailymotion.com/video/x2fbylhh.

[270] "Man and The Moon," *Disneyland*, aired December 28, 1955, accessed from https://www.youtube.com/watch?v =1ZImSTxbglI; "Man In Space," *Disneyland,* aired March 9, 1955, accessed from https://www.youtube.com/watch?v=1ZImSTxbglI.

better understanding of what the American public was being told about space, it would be beneficial to study other types of media including fictional and non-fictional magazines, television, movies, and radio programs.

National Geographic would be a significant publication to examine for space-predictions and space coverage. In 1888, the National Geographic Society started a scholarly journal that only reached its 165 members. By the 1920s, the magazine was available to the public and reached more than 700,000 people.[271] As a magazine that focuses on science, geography, history, and world culture, the age of space exploration was perhaps one of the most exciting developments for the magazine's content. Dozens of articles before the Moon landing examined the possibilities that lingered beyond the atmosphere. Many scientists and astronomers also contributed pieces to the magazine. Today, *National Geographic* has grown to be a prominent part of American media with the magazine reaching millions of subscribers and their television networks being a huge success.[272]

The local papers severely lacked diversity; this was most likely due to the nature of America's social climate at the time. However, the lack of coverage on people of color and females during the Space Race did not represent the truth behind who was working behind the sciences. The book *Hidden Figures* reveals that African-American female mathematicians were instrumental in solving calculations for the Space Race.[273] More research should be done on newspaper coverage related to diversity in NASA, space coverage, and outer space in general. Issues related to diversity might not seem relevant to space, but as humans continue to travel

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[271] "January 27, 1888: National Geographic Society Gets Going," Wired, January 27, 2010, https://www.wired.com/ 2010/01/0 127national-geographic-society-founded/.

[272] National Geographic, "National Geographic Shows 13.9 Million Worldwide Audience via Consolidated Media Report," September 24, 2012, http://press.nationalgeographic.com/2012/09/24/national-geographic-shows-30-9-million-worldwide-audience-via-consolidated-media-report/.

[273] Margot Lee Shetterly, *Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race,* (New York: Harper Collins Publishers, 2016).

further, it will be important to maintain improvements in equality and inclusion.

National Geographic would also be a useful publication for future studies on diversity and space exploration. Since December 1969, over 25 covers have featured images and stories about space; not to mention the dozens of other inside and online articles.[274] In March of 2018, the female American astronaut Peggy Whitson was featured on the cover. Whitson is the American who holds the record for the longest time spent in space, 665 days. Her appearance on the cover should be considered a significant decision by *National Geographic* because many of the articles before the Moon landing depicted astronauts as white males.

International and commercial cooperation has increased dramatically since the Space Race, meaning space events are not entirely government projects. A future study might look into differences in coverage on NASA and commercial spaceflight missions and launches. Ultimately, there are endless possibilities with spaceflight and in turn, endless research opportunities.

Limitations

The majority of this study focused on three publications: The *Houston Chronicle, Huntsville Times* and *Orlando Sentinel.* While some articles discussed the local angle such as showing appreciation for NASA's economic impact on the respective city, most of the articles resembled the national coverage discussed. This may be due in part to the fact that over approximately 50 of the 150 articles examined were stories from the Associated Press or United Press International. This likely suggests those articles were also published in other newspapers

[274] All of these issues of *National Geographic* featured a space-related image on the cover: August 1970, July 1971, May 1974, January 1980, March 1981, October 1981, July 1981, June 1983, September 1983, October 1986, November 1996, August 1998, January 2000, January 2001, January 2004, December 2004, December 2006, December 2009, June 2012, July 2013, March 2014, July 2014, March 2015, July 2015, November 2016, August 2017, February 2018, March 2018, accessed via the National Geographic Virtual Library.

around the country.

Additionally, the Space Race, while directly affecting the communities where NASA set up shop, was a national event and source of American pride. It is not suprising that national and local coverage closely aligned, especially because this study focused on major milestones that would grab the attention of more than just the locals of Huntsville, Houston, and Orlando. However, editors still needed to make the explicit choice to publish certain wire stories; article-selection does not happen randomly so arguably the process of selecting AP stories is part of setting the public news agenda. Nonetheless, while local journalists and voices were published in the papers examined, a significant number of the predictions came from a national perspective. Perhaps future studies should examine articles during random times instead of milestones to reveal more local opinions.

The scope of this study does not fully represent the American or Huntsville, Orlando, or Houston populations. As mentioned, there were a significant number of other forms of media competing for the attention of the American public. While this study gives a glimpse into what "NASA-locals" predicted about space, the articles examined are not the full-scope of their opinions.

Conclusion

A majority of the predictions found in this thesis were correct about the future of space exploration, so it will be fascinating to observe what modern media expects from the next major milestones. Modern predictions should be monitored as they might give a genuine glimpse into the future. There are limitless opportunities for space exploration because the world is continuously evolving, and humans are capable of creating incredible things. John F. Kennedy's speech at Rice University is perhaps one of the greatest rallies in American history. The moment

JFK challenged America to literally reach for the stars lit a fire in many people's souls. JFK eloquently gave his thoughts on how far humanity had come, and his famous words showed how quickly humanity can rise to the occasion. In his description he condensed humanity's recorded history into a time span of 50 years.

> Last month electric lights and telephones and automobiles and airplanes became available. Only last week did we develop penicillin and television and nuclear power, and now if America's new spacecraft succeeds in reaching Venus, we will have literally reached the stars before midnight tonight.
>
> This is a breathtaking pace, and such a pace cannot help but create new ills as it dispels old, new ignorance, new problems, new dangers. Surely the opening vistas of space promise high costs and hardships, as well as high reward.[275]

Who is to say that humans couldn't eventually make it to Pluto or even outside of the Solar System? Recent movies such as *Ad Astra, Interstellar,* and *The Martian* already play with those ideas.[276] The general public is becoming increasingly more involved with space exploration through technology competitions, NASA partnerships and commercial companies. Outer space has never been more relevant to the American public or world.

After the Apollo missions, NASA experienced a massive lull in the media and public conversation:

> The first Apollo landing was, in one sense, a triumph that failed, not because the achievement was anything short of magnificent but because of misdirected expectations and a general misinterpretation of its real meaning. The public was encouraged to view it only as the grand climax of the space program, a geopolitical horse race and extraterrestrial entertainment – not as a dramatic means to the greater end of developing a far-ranging spacefaring capability.[277]

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[275] John Fitzgerald Kennedy, "Address at Rice University in Houston Texas on the Nation's Space Effort," September 12, 1962, accessed from the JFK Library: https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-at-rice-university-on-the-nations-space-effort.

[276] *Ad Astra,* directed by James Gray, (Twentieth Century Fox, August 29, 2019); *Interstellar,* directed by Christopher Nolan, (Paramount Pictures, October 26, 2014); *The Martian,* directed by Ridley Scott, (Twentieth Century Fox, October 2, 2015), DVD. All of these movies follow astronauts' journey through outer space and address the challenges associated with survival and space and time relevance. These movies make direct predictions about the future of spaceflight.

[277] Alex Roland, *A Spacefaring People: Perspectives on Early Spaceflight,* (Washington D.C.: U.S. Government Printing Office, 1985), 71, https://history.nasa.gov/SP-4405.pdf.

Humans have not been to the Moon since 1972, but NASA is promising to send people back in four years. The general public may not think about space every day; however, space is affecting their lives in every moment now. During the Space Race, journalists, scientists, NASA personnel, and people around the world made great attempts to predict the challenges and discoveries associated with the exploration of the universe. Together, the bold and realistic predictions revealed diverse attitudes about the feat of space travel, the agenda and culture of NASA, and the imaginations of those who were closest to the action of the Space Race. Space exploration's "breath-taking pace," incredible discoveries, and ability to genuinely capture attention makes it a topic worth examining in any capacity.[278]

[278] "Breath-taking" pace is a reference to JFK's speech at Rice University.

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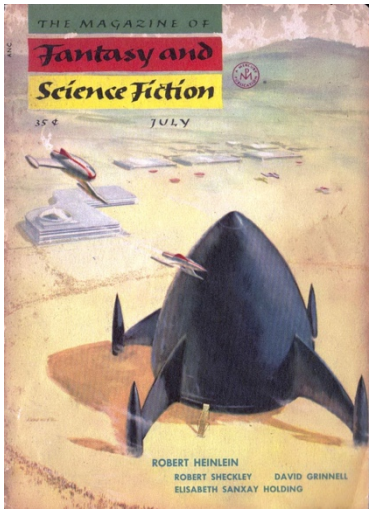
APPENDIX

Figure 7. List of Space Race milestones examined for this study.

Date	Event	Country
October 4, 1957	First Satellite is launched in to space, Sputnik 1	USSR
November 3, 1957	Dog launched into space on Sputnik 2	USSR
January 31, 1958	First American Satellite sent into space, Explorer 1	USA
October 1, 1958	NASA is officially created	USA
May 28, 1959	First animals successfully return from space alive	USSR
September 14, 1959	First spacecraft lands on moon, Luna 2	USSR
January 20, 1961	John Fitzgerald Kennedy becomes President of the United States	USA
April 12, 1961	First human flies in space	USSR
May 5, 1961	First American flies in space	USA
August 27, 1962	Mariner 2 launches (unmanned mission to Venus)	USA
September 12, 1962	"We choose moon" speech given at Rice University by JFK	USA
December 14, 1962	Mariner 2 reaches Venus	USA
June 16, 1963	First woman in space	USSR
October 12, 1964	First multi-person crew in orbit	USSR
March 18, 1965	First spacewalk	USSR
July 14, 1965	Spacecraft takes closest pictures to Mars	USA
December 15, 1965	First orbital rendezvous	USA
February 3, 1966	First soft landing on Moon First photos from another world	USSR
January 27, 1967	Apollo 1: capsule explodes during test launch and kills crew	USA
October 11, 1968	Apollo 7 launches	USA
October 22, 1968	Apollo 7 returns	USA
December 21, 1968	Apollo 8 launches	USA
December 27, 1968	Apollo 8 returns	USA
March 3, 1969	Apollo 9 launches	USA
March 13, 1969	Apollo 9 returns	USA
May 18, 1969	Apollo 10 launches	USA
May 26, 1969	Apollo 10 returns	USA
July 16, 1969	Apollo 11 launches	USA
July 20, 1969	Men first land on Moon	USA
July 24, 1969	Apollo 11 returns	USA

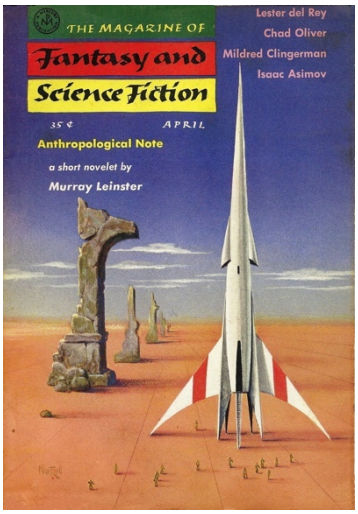
Figure 8. Various covers from *The Magazine of Fantasy and Science Fiction.* See footnote 213.

April 1954 Issue

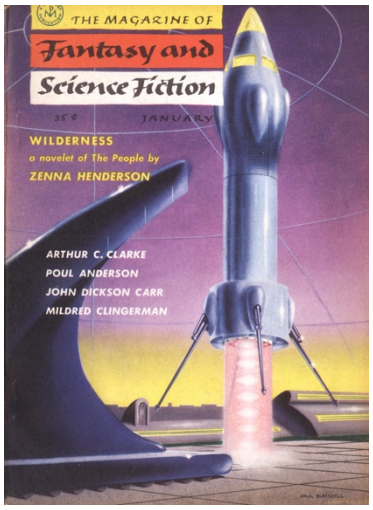


July 1954

November 1954



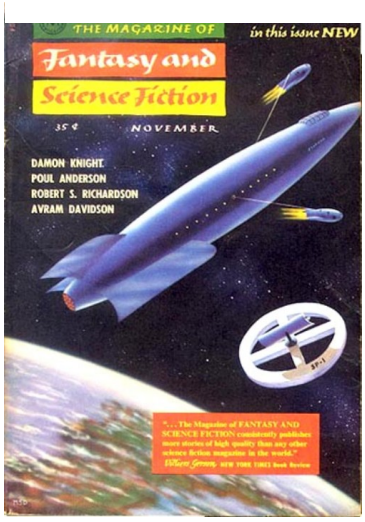
April 1957



January 1957

April 1953

July 1953



November 1957

Figure 9. National Aeronautics and Space Administration, "A Plan for Openness," February 15, 2017, https://www.nasa.gov/open/plan. See footnote 257.