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**A COMPARATIVE ANALYSIS OF THE EFFICACY OF NASA MEDIA  
RELATIONS STRATEGIES AND THE RELATIONSHIP TO U.S. SPACE  
POLICY**

by  
Julian Harris Gibson

A Thesis  
Submitted to the  
Department of Public Relations  
College of Communications  
In partial fulfillment of the requirement  
For the degree of  
Master of Arts  
at  
Rowan University  
July 25, 2012

Thesis Chair: Joseph Basso, PhD

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## **Dedication**

I would like to dedicate this thesis to my family and the international aerospace science community of scientists, researchers and journalists who have helped take mankind to the heavens.

## **Acknowledgements**

I would like to extend my thanks and gratitude to my thesis advisor Dr. Joseph Basso for his patience and guidance throughout this project. Additionally, I would like to thank the entire faculty at Rowan University for their unwavering support and wisdom.

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- Debbie Rivera, Senior Manager of Strategic Alliances – NASA
- Stephanie Schierholz, Social Media Manager – NASA
- Stephen Garber, Historical Program Office - NASA

Thank you all and I hope to call you a colleague someday.

## **Abstract**

Julian Harris Gibson

### **A COMPARATIVE ANALYSIS OF THE EFFICACY OF NASA MEDIA RELATIONS STRATEGIES AND THE RELATIONSHIP TO U.S. SPACE POLICY**

2011/12

Joseph Basso, Ph.D.

Master of Arts in Public Relations

The purposes for this comparative analysis were to (a) compare the efficacy of NASA media relations strategies according to NASA's stakeholders and (b) reveal if these media relations strategies have a causal relationship or correlation with U.S. space policy. NASA employees reflected positive responses to questions related to the efficacy of NASA media relations strategies and the overall communications philosophy of the organization. Journalists who report on NASA through traditional and online channels had mixed responses toward the organizations media relations efforts during crisis situations like the Columbia and Challenger shuttle disasters. However, journalists were very supportive of NASA's dissemination of information through social media platforms. Additionally, the author conducted an extensive review of volumes of literature related to NASA's media relations activities over a 50 year period. The facts revealed in the literature suggest the relationship between NASA media relations strategies and U.S. space policy has elements of causality and correlation. These elements vary according to factors like geo-political climate, inter-organizational communication, economics, and public perception.

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## **Chapter 1**

### **Introduction**

According to the 1958 National Space Act, NASA is mandated to communicate its activities to the public (NASA, 2005 (Sec. 203) pg. 7). Eligar Sadeh stated in a 2006 article titled, *Management dynamics of NASA's human spaceflight programs* in the journal *Space Policy*, that political, organizational and technical issues are NASA's three areas of accountability to the public in its management (E. Sadeh, 2006 pp. 1-5). Therefore, NASA's media relations activities are critical to every aspect of its operations.

According to the 1958 National Space Act's statutory provision, NASA must seek congressional authorization and appropriations annually and submit information to congressional reviews of its policies, programs, plans, and budgets (E. Sadeh 2006 pg.2). Since its inception, NASA has employed various media relations strategies to inform and influence specific publics. The author researched the relationship between NASA's media relations strategies during the Mercury, Apollo and International Space Station eras and their relationship to any adjustments of U.S. space policy during each one of these eras.

To understand the public relations strategies of NASA during the aforementioned eras, the author reviewed NASA's history. Weneth D. Painter stated in *NASA's Contributions to Aeronautics, Volume 2*, that NACA was modeled after the British Advisory Council for Aeronautics (BACA) after World War I in an effort to bring American aeronautical engineering to the British standard (Hallion et al, 2010 pg. 420). The passage of the American Commerce Act in 1926 paved the way for airmail, commercial airliners, private jet flight, and the entire civilian aviation industry.

Consequently, without NACA's influence, the American space program, American aeronautics industry, and civilian air transport could be decades behind today's capabilities (Hallion et al, 2010 pg. 420).

Moreover, historians like Richard P. Hallion suggested this single fact makes NASA's influence on the aeronautical industry undeniable. Hallion alluded to this sentiment in the preface of his book by stating that aeronautics represents the first "A" in NASA (Hallion et al, 2010 pg.8). Additionally, Weneth Painter stated in *NASA's contributions to aeronautics, Volume 2*, that NASA's aeronautical research influenced all parts of the aviation industry like commercial airliners, private jets, hypersonic flight, aircraft design, safety, and aerospace technology (Hallion et al, 2010 pg.420).

Historian T.A. Heppenheimer concurred with Painter's assessment in his chapter of *NASA's contributions to aeronautics, Volume 2*, that NACA transformed into the National Aeronautics and Space Administration (NASA) in 1958 under the direction of President Dwight D. Eisenhower, partly in response to Russia's launch of Sputnik I in 1957 (Hallion et al, 2010 pg. 299). Heppenheimer's case study explained how NASA's research in trans-atmospheric flight developed the necessary technology to achieve re-entry of Eisenhower's main priority, the Intercontinental Ballistic Missile or (ICBM) (Hallion et al, 2010 pg. 323).

When NASA's tests of its Jupiter-C rocket achieved successful re-entry in August 1957, Eisenhower held a press conference to ease the fears of Americans about Russian supremacy in space (Hallion et al, 2010 pg. 323). Painter's case study on NASA's contributions to general aviation suggested the research findings of NACA-NASA's aeronautical division repeatedly influenced government officials to continue to fund

research that eventually lead to achievements in aeronautics and spaceflight. Painter defined general aviation in the context of aircraft utilization, not simply the industry of aviation or aircraft specifications (Hallion et al, 2010 pg. 342).

Kristen Starr suggested in her dissertation, *NASA's Hidden Power: NACA/NASA Public Relations and the Cold War, 1945-1967* that NASA's public information officers underestimated the level of intrigue and media scrutiny NASA would face from the onset (Starr, 2008 pg. 153). The literature also suggested public relations played a vital role in NASA's operations from its inception (Starr, 2008 pg. 143).

Walter T. Bonney, the first public information director at NACA and NASA, crafted messaging that framed the purpose of NASA operations favorably to the press, who in turn communicated these messages to the public (Starr, 2008 pg. 143). Prior to Bonney's role as public information officer for NACA and NASA, he served in the same capacity for Bell Aircraft (Starr, 2008 pg.143).

The Mercury missions were America's first attempts at manned spaceflight. The initial success of NASA itself was closely tied to the Mercury missions. To gain support from the public, NASA conducted several press conferences in which the preliminary stages of NASA programs were publicized. For example, Kristen Starr stated the announcement of the first NASA astronauts, called the Mercury 7, was a watershed moment for NASA and its relationship with the media (Starr, 2008 pg.147).

The Mercury missions took place at the height of the Cold War. Consequently, the image of the U.S military's best and brightest now working for NASA helped create a positive public perception of NASA (Starr, 2008 pg. 133).

According to George Washington University professor John Logsdon, President John F. Kennedy's speech on space in 1961, galvanized America around NASA's operational goal of beating the Russians to the Moon. During this speech, President Kennedy made the audacious claim that "America would put a man on the Moon by the end of the decade" (Kennedy, 1961). Charles F. Bolden Jr., the current administrator of NASA recently stated, he was a teenager at the time of President Kennedy's speech which inspired him to dream of one day working at NASA (Bolden, 2011 pg.1). The author will examine the President Kennedy's decision to publicly acknowledge a "space race" between America and Russia to discover if this action was part of the public affairs strategy of NASA and the President. The author reviewed literature that revealed if this message positively affected NASA's operations and development. The author will review the literature to reveal if the acknowledgement of Russia as a formidable rival in space was at its core, a media relations strategy.

According to Aerospace and Telecommunications Policy specialist Maria C. Smith, the International Space Station's history is watermarked by four specific years (CRS, 2005 pg. CRS-1). During her testimony to the U.S. House Science Committee, Smith states that each of the following years spawned an important era in the development of the ISS. Smith delineates those years as 1984; when President Reagan directed for its construction during his State of the Union address; 1991 when the House of Representatives held its first vote related to terminating the program; 1993 when the ISS program survived termination by a one-vote margin in the house of Representatives with Russia joining the program the same year; and 1998 when construction on the ISS began (CRS, 2005 pg. CRS-1). Smith's testimony explains that NASA sought permission

to build a permanent Space Station since the 1960's (CRS, 2005 pg. CRS-1). Furthermore, Smith explains that due to budget constraints, NASA had to choose between building the Space Station and developing the Space Shuttle (CRS, 2005 pg. CRS-1). During chapter 2 of this thesis the author will examine the media relations strategies employed by NASA to persuade one its most important publics--Congress. Moreover, the author will research the space policy of each presidency from Dwight Eisenhower to Barack Obama to research the relationship between those policies and the affect on NASA's media relations strategies (Steinberg, 2011 pgs. 240-246).

The dynamics of this relationship are worthy of study because the Gillet Amendment to a 1913 U.S. House of Representatives appropriation bill prohibits NASA from spending any money on publicity to influence any of its key audiences to vote for or against any legislation. The author will research how this law and other space policies affect NASA's public affairs and media relations strategies.

### **Significance of the Study**

NASA has used media relations for over five decades, several Presidential Administrations and various advances in technology. Previous studies of this topic mainly focus on one Presidency, a single historical era, or a case study of a single NASA program and fail to reveal the correlation between U.S. space policy, the adjustment to that policy by NASA, and the communication of those adjustments during all three eras included in this thesis. According to NASA's Social Media Manager Stephanie Schierholz, NASA's media relations efforts are vast and currently involve all traditional and new media formats (Cureton et al, 2011 pg.4). Thus, the author included survey

questions to reveal if respondents feel NASA's use of social media allows public information officers to communicate with their publics more effectively than traditional methods such as print media.

In recent years, NASA has used social media as a tool of media relations and audience segmentation. Therefore, the author performed a comparative analysis of NASA's use of traditional media and its use of social media as part of the literature review. The analysis of this subtopic was analyzed from a public relations perspective to assess the relationship between NASA media relations strategies and space policy.

### **Purpose of the study**

The author conducted a comparative analysis of NASA's media relations strategies and tactics during the Mercury, Apollo, Space Shuttle and International Space Station programs. The author then performed summative research to reveal if respondents felt certain strategies had a positive or negative effect on U.S. space policy. The author added to the body of knowledge by researching how U.S. space policy affects NASA public affairs strategies and tactics. This research topic is currently important to the field of media relations in the aerospace industry due to the fallout from President George W. Bush's decision to end the space shuttle program in 2003 and President Obama's continuance of that mandate in 2011 (Pace, 2011 pgs.1-3).

## **Situation Analysis**

Throughout its 52-year history, NASA has constantly adapted to the political world around it (Pace, 2011 pg. 1). The research suggested the effectiveness of NASA's media relations directly affects its operational capabilities in the past and will do so in the future. Therefore, this topic remains beneficial to the field and worthy of further study. For example, Dr. Scott Pace of the National Space Policy Institute at George Washington University stated during his 2011 congressional testimony that due to constant congressional budget cuts, NASA has spent \$21 billion on canceled missions over the past twenty years (Pace, 2011 pg.4). This statement supports Sadeh's sentiment referring to the political oversight of NASA directly affecting its public management (E. Sadeh, 2006 pg. 236).

## **Procedure**

To understand the dynamics of the relationship between U.S. Space policy and NASA's use of social media, the author conducted surveys, interviews and a Delphi Study comprised of six PRSA fellows. Respondents were contacted digitally using the website surveymonkey.com to collect data from all members of the research sample in the same manner.

Due to the author's status as an outsider to PRSA, the author used snowballing, as a method of gaining access to PRSA fellows to complete the Delphi Study. The questions included in the Delphi Study were designed to gauge the respondent's knowledge, behavior and attitude of what topics should and should not be included in a social media campaign over the course of three rounds. The author's goal was to gain an expert

perspective on the issue of media relations. The Delphi Study contained no more than three questions per round.

Additionally, the author surveyed journalists who report on NASA activities and communicate with NASA through its numerous social media platforms. These surveys were conducted scientifically and reveal the perception of NASA's current media relations from the perspective of its various publics.

Finally, the author conducted individual interviews with key NASA public affairs personnel to add qualitative data that revealed how and why certain media relations strategies became implemented during each aforementioned era. Furthermore, these interviews revealed the attitude and behavior of NASA employees related to certain changes in U.S. Space Policy. Additionally, these interviews revealed how NASA public affairs officers disseminate information.

## **Hypotheses**

H1- The majority of respondents will have a positive perception of NASA media relations.

H2- The majority of PRSA Fellows will tout ethical principles as important elements of social media campaigns and regaining trust with the media.

H3- The majority of respondents will favor NASA's online media relations efforts to its print media relations efforts.



## **Assumptions**

- The author assumed that terms used in the survey reflected accurate terminology and were familiar to PRSA fellows and journalists who report NASA and the space industry.
- The author assumed that NASA's media relations could be accurately assessed by PRSA members and journalists who report NASA activities.
- The author assumed respondents gave honest answers to survey questions.

## **Delimitations**

The specific Presidents included in this thesis are Dwight Eisenhower, John F. Kennedy, Ronald Reagan, and Barack Obama. Each of these presidents affected U.S. space policy in their own way. Consequently, each president affected organizational behavior and the communication of that behavior by NASA public information officers. The author did not extrapolate the survey results to the entire universe of NASA employees, PRSA members or NASA-related social media consumers.

The author did not focus on areas of NASA public relations not related to space policy or media relations. The author used formal research methods to sample journalists and followers of NASA on social media. The author used digital tools of collecting survey data to prevent survey bias and to make sure all respondents receive the survey questions in the same manner. The author focused the content of the literature review on NASA public affairs during the Mercury, Apollo and ISS eras.

## **Definition of Terms**

1. NASA- National Aeronautics and Space Administration
2. MSFC- Marshall Space Flight Center, NASA facility located in Huntsville, Alabama
3. ISS- International Space Station
4. Apollo era – NASA manned space flight missions to orbit and travel to the Moon.
5. Media Relations Strategy- tools used by NASA in order to communicate its messages to the press and public.
6. Journalist- reporters who cover NASA activities in print, web or audiovisual formats
7. Mass Media- newspaper, magazine, internet, radio and television platforms
8. Social Media- Digital platforms of communication such as-You tube, Twitter, Ustream, Facebook and email
9. Cluster Sample- stratified, segmented group of respondents that are selected for the purposes of the survey
10. PRSA- Public Relations Society of America
11. Snowballing- a form of sampling used in order to get one respondent to recruit others to participate in the study
12. Archival Data- coverage of past and present NASA activities in mass media and scholarly journals
13. NASA Tweetup- official/ unofficial NASA event where 150 of NASA's twitter followers attend/ watch a lecture or panel discussion and report the information discussed at that event via Twitter to all their individual twitter followers.

## **Chapter 2: Literature Review**

### **Public Affairs**

The literature suggested NASA's initial media relations efforts created the foundation for a relationship between NASA and the media that has been mostly positive (Starr, 2008 pg.157). Additionally, the literature suggested the media relations strategies utilized during NASA's early years were an important contributor to its sustainability during crises such as the space shuttle Columbia and Challenger disasters (Sadeh, 2006 pg.142).

According to Glenn Broom, the practice of public relations within government agencies is referred to as public affairs (Cutlip, Center, Broom 2009 pgs. 424-426). The Gillet Amendment to a 1913 U.S. House of Representatives appropriation bill prohibits government agencies from spending money on "publicity" unless specifically allowed by Congress (Cutlip, Center, Broom 2009 pg. 16). Congress further restricted the practice of public affairs by passing Public Law 93-50, Section 305 enacted July 1, 1973. This law reaffirmed the 1913 statute, but clarified the issue of propaganda related to pending legislation (Cutlip, Center, Broom 2009 pg. 16).

Under this law, no agency or administration can spend money on publicity or propaganda related to supporting or defeating legislation pending before Congress (Public Law 93-50, 1973). This legislative restriction causes public information officers to rely on media relations to get their messages to the general public (Cutlip, Center, Broom 2009 pg. 425).

As previously mentioned, NASA has an obligation to inform the public about its activities because of its use of tax dollars to facilitate its operations (Cutlip, Center, Broom 2009 pg. 407). To achieve this goal, public information officers frame messages to do the following: (1) inform constituents, (2) invoke public participation, (3) assess public opinion, (4) serve as the public's advocate, and (5) communicate with the public through media channels (Cutlip, Center, Broom 2009 pg. 16).

Additionally, public information officers often face challenges in effectively communicating with the public. Some of those challenges can be attributed to a lack of credibility with citizens, a lack of public apathy, and legislative hostility. According to Broom, citizens sometimes refer to public information officers as "spin doctors" and the organizations they represent as propaganda machines (Cutlip, Center, Broom 2009 pg. 16).

According to Broom, this skepticism can be attributed to either the citizen's distrust of the practitioner's ethical standards or the unethical track record of the organization the practitioner represents (Cutlip, Center, Broom 2009 pg. 344). Moreover, Broom stated public apathy can affect a public information officer's ability to specifically target a small group of citizens. Additionally, public information officers are charged with the task of reaching all the taxpayers or as many as possible. Conversely, private practitioners can purposely target small segments of the population with their messaging.

Legislative hostility refers to the struggle between public affairs practitioners and legislators, especially at the Federal level.

Historically, four conflicts have been at the center of the hostility:

(1) The struggle between the people's right to know information and government official's preference to keep certain information discrete. (2) The unrelenting struggle between the legislative and executive branches of government. (3) The continuing struggle for power between the two major political parties. (4) The protests of industries, institutions, and other vested interests (Cutlip, Center, Broom 2009 pg. 423).

Consequently, credibility, public apathy, legislative hostility, and the four conflicts listed above often limit the effectiveness of public affairs practitioner's efforts (Cutlip, Center, Broom 2009 pg. 423).

### **Shannon and Weaver model of communication**

The Shannon and Weaver model of communication, developed by Claude Shannon, comprises an information source/encoder, message/signal, channel, and receiver/destination (Cutlip, Center, Broom 2009 pg. 188). Unfortunately, communication can break down in this model due to the following: (1) **Interference/ Noise** – anything that interferes with one's ability to decode the information being transmitted can cause the break-down of communication. (2) **Technical issues**- technical issues occur when either the signal or channel being used to communicate distorts the message being transmitted from the source to the sender (Cutlip, Center, Broom 2009 pg. 188). (3) **Semantic / fidelity issues**- these issues occur when the perception of the message being sent differs from what the sender intended (Cutlip, Center, Broom 2009 pg. 188). (4) **Influence issues**- influence issues occur when the sender's message did not produce the desired result on the receiver.

### **Schramm model of communication**

The Schramm model, developed by Wilbur Schramm, involves a two-step process where both the sender and receiver operate within the context of their particular frame of reference. According to the Schramm model, communication involves a reciprocal exchange of signals to inform, persuade, and instruct each participant. Glenn Broom suggests the relationship and social context of the communication are conditioning factors in this model (Cutlip, Center, Broom 2009 pg. 189). According to Broom, the process of informing involves four steps: (1) Attracting attention to the communication. (2) Achieving acceptance of the message. (3) Having the communication interpreted as intended by the sender. (4) Getting the message stored for later use.

### **Persuasion Theory**

To accomplish objectives, NASA's public affairs officers can use persuasion theory. *Elsevier's Dictionary of Psychological Theories* states persuasion theory comprises people using messages to influence others. Sociologist D.J. O'Keefe says persuasion theory's point of emphasis encompasses persuading a subject through information to change his/her motivation or values, thereby affecting their attitude and behavior (D.J. O'Keefe, 2002 pgs. 2-5).

### **The rational model of persuasion**

The rational model of persuasion allows researchers to scientifically study the relationship between persuasive stimuli and its effect on attitude or behavior. Public relations practitioners often employ strategies that have persuasive impacts on their target audience (Starr, 2008 pgs.250-255). Starr explained in her dissertation how NASA must adapt to its ever changing political environment. Therefore, NASA public information

officers use methods similar to persuasion theory to influence target audiences like politicians, journalists, government agencies, aeronautics and space industry executives, military contractors, and political advisors (Starr, 2008 pgs.250-255).

Dr. Logsdon, states in his book *Decision to go to the Moon* these target audiences have the greatest influence on NASA's ability to achieve its objectives. Hence, according to the literature, NASA's efficacious use of persuasion theory directly affects its organizational behavior. Persuasion theory employs belief, value, motive, attitude and behavior.

### **Diffusion model**

According to Bolen and Beale, the diffusion model involves spreading new ideas and practices to a social system (Bagin and Fulginiti, 2005 pg.47). This process follows the traditional persuasion theory, but implements new elements that examine the implementation of a new idea or policy. The five steps involved in the diffusion model are listed as follows: (1) **Knowledge**- people learn about an innovation and some gain understanding of it. (2) **Persuasion**- potential adopters develop interest in the innovation. They seek more information and consider the innovation's general merits. (3) **Decision**- potential adopters decide to adopt or reject the innovation after weighing its merits for their own situation. (4) **Implementation**- adopters implement the innovation, initially on a small scale. They are interested in the practice, techniques, and conditions for application. (5) **Confirmation**- adoption of the innovation either gets reinforced or reversed based on evaluation.

According to Don Bagin and Anthony Fulginiti, mass media enhances the impact of the knowledge phase of this process. The persuasion, decision, implementation and confirmation stages of this process can often take a long time (Bagin and Fulginiti, 2005 pg.47).

### **Two-Step Flow Theory**

The two-step flow theory, developed by Katz and Lazarsfeld, suggests that there is a trio of variables involved in persuading an audience. Those variables are the media, influential figures and the public. According to Katz and Lazarsfeld, each variable in the process has an important role. For example, two-step flow theory involves the following steps: (1) The media put ideas, information and opinions into play. Influentials or key communicators pick up those messages and proceed to influence the public. (2) Various publics adopt the opinions and ideas because they believe the influentials. Bagin and Fulginiti point out that this theory is similar with the aforementioned diffusion theory (Bagin and Fulginiti, 2005 pg.47). Furthermore, Bagin and Fulginiti mention that public relations practitioners can play a role in the first step by feeding ideas to the media.

### **Public Relations Models**

A comprehensive understanding of public relations models would allow NASA's media relations to be evaluated according to standards established by experts in the field of public relations. By using established PR theory as a guide, the author can properly evaluate the efficacy of NASA's media relations strategies. According to James Grunig and Todd Hunt there are four models that public relations practitioners use to communicate with their audience. These models are described as press agency, public



information, two-way asymmetrical communication and two-way symmetrical communication (Grunig and Hunt, 1984 p.22).

Grunig and Hunt describe the one-way, press agency model as a propaganda model (Bagin and Fulginiti, 2005 pg.2). According to Grunig and Hunt, propaganda comprises gaining attention for an organization by retaining control of the message. Additionally, communication is one-way, from the organization out to its publics (Bagin and Fulginiti, 2005 pg.2). Furthermore, Grunig and Hunt state the press agency model deems the organization important and the public unimportant (Grunig and Hunt, 1984 pg. 22).

Grunig and Hunt describe the one-way, public information model as a publicity model. According to Bagin and Fulginiti, publicity involves using information to attract attention. The attention generated from the information should influence attitudes and ultimately opinion (Bagin and Fulginiti, 2005 pg.2). Grunig and Hunt's textbook suggests the public information model considers the organization and public important (Grunig and Hunt, 1984 pg. 22).

Grunig and Hunt describe the two-way asymmetrical model as the persuasion model. In this model an organization communicates with its public to reveal the most effective messaging and channel to persuade them (Bagin and Fulginiti, 2005 pg.3). Once the organization gains this information it includes the information in its messages to gain positive public opinion. Bagin and Fulginiti explain that this technique is often used in marketing. According to Grunig and Hunt the two-way asymmetrical model considers the organization and public important (Grunig and Hunt, 1984 pg. 22).

Grunig and Hunt describe the two-way symmetrical model as the consensus model. In this model the organization works with the public to discover policies that are mutually beneficial to the organization and the public. Grunig and Hunt describe the communication in this model as two-way (Bagin and Fulginiti, 2005 pg.3).

### **Media Relations**

As stated earlier, NASA has a legislative mandate to communicate with the public. Therefore, NASA must engage in media relations to communicate its messages. According to NASA's former Social Media Manager Stephanie Schierholz, "NASA is charged with communicating the activities of the agency in fulfillment of its mission as widely as possible, and it is one of our core values." (Schierholz/ IT Talk 2011 pg.4). NASA uses several methods to satisfy this mandate such as holding press conferences, producing media kits and issuing press releases. The following paragraphs describe the elements involved in this process.

According to Cutlip and Center, media relations protocol lists several maxims a practitioner should follow. The four most important maxims are: (1) Shoot squarely, be honest- Practitioners should be honest and open when good or bad news occurs. This allows a trust to exist between the press and the practitioner. This relationship benefits the organization. (2) Give service and accessibility- Practitioners should provide newsworthy, interesting and current content to journalists to establish a positive relationship. It only benefits the practitioner to provide journalists with access to information about newsworthy events. (3) No begging or complaining- Practitioners should never plead with editors or journalists to cover an event. Complaining about lack of coverage also does the practitioner and the organization a disservice. (4) Do not ask for

kills- Practitioners lose credibility and only make a bad situation worse when they attempt to pressure or persuade the press to “bury” a story. NASA communication policy supports the aforementioned maxims. NASA employees must follow the following code of conduct: (1) Be honest and accurate in all communications. (2) Honor publication embargoes. (3) Respond promptly to media requests and respect media deadlines. (4) Act promptly to correct mistakes or erroneous information, either internally or externally. (5) Promote the free flow of scientific and technical information. (6) Protect non-public information.

### **M-A-C Triad**

Bagin and Fulginiti state that the MAC triad is the most important model for successful public relations (Bagin and Fulginiti, 2005 pg.29). The MAC triad has three elements: Message, Audience and Channel. According to Bagin and Fulginiti, if one link in the MAC triad breaks down effective communication cannot happen (Bagin and Fulginiti, 2005 pg.29).

Additionally, Bagin and Fulginiti provide the following examples: (1) If practitioners use the right message and the right channel but target the wrong audience, communication fails. (2) If practitioners use the right message and target the right audience but use the wrong channel, communication fails. (3) If practitioners target the right audience using the right channel but communicate the wrong message, communication fails.

## Messages

Fulginiti and Bagin suggest the most important part of the public relations communication process is acquiring, making and expressing messages (Bagin and Fulginiti, 2005 pg.27). The scholars state that acquiring messages involves research. Bagin and Fulginiti state that practitioners can **acquire** messages from conducting focus groups, interviews, surveys, speeches, writings, complaints, congratulations, and any other manner an audience reveals its opinion (Bagin and Fulginiti, 2005 pg.27). Furthermore, Bagin and Fulginiti state that if practitioners conduct enough research, the audience will reveal its own messages (Bagin and Fulginiti, 2005 pg.27). According to Bagin and Fulginiti, practitioners should use the findings of their research to reveal the appropriate tone when making messages. Finally, Bagin and Fulginiti state that practitioners should conduct additional research to select the appropriate channel to reach a specific audience when expressing messages (Bagin and Fulginiti, 2005 pg.27).

Allan Center and Patrick Jackson, Public Relations Society of America fellows and authors of the book *Public Relations Practices* list several maxims that every practitioner must know. The maxims related to messages are listed as follows: (1) Messages that appeal to audience self-interest is most likely to be effective. (2) A source of information regarded as trustworthy, expert, or authoritative is most likely to be believed. (3) Understanding the subject is the first requisite for a communicator wishing to explain the subject to others. (4) A suggested action or appeal, as part of a message or attached to it, is more likely to be accepted than a message by itself. (5) Personality needs and drives as well as peer group identity affect the acceptance of messages and positions on issues.

(6) Degree of clarity, simplicity and symbolism has a direct and measurable effect on message acceptance. (7) Explicitly stated messages and appeals are more effective at changing behavior and opinion than explanations of concepts or theory. (8) Messages related to goals are accepted easier than messages concerned with the steps and methods of reaching a goal.

(9) When the difference between opinions is hard to differentiate, the argument heard last usually has more impact. (10) When the public is confused over an issue, messages that speak to what that public wants to believe or hope for are more effective than messages that strike a discord with their beliefs (Carter and Jackson, 2003 pgs.6-7).

### **Sputnik I: The start of the “Space Race”**

According to Van Dyke, President Eisenhower was not moved by claims that American achievements in space would enhance either scientific or militaristic prestige. However, after the launch of Sputnik I journalists elevated the idea of Russian superiority in space to the forefront of the American consciousness (Van Dyke, 1964). On October 8, 1957, Eisenhower met with experts on the issue of space science. These specialists, Detlev Bronk, president of the Academy of Sciences, and Alan Waterman, director of the National Science Foundation, helped construct a damage control strategy and carefully craft the messaging of America’s response to Sputnik I (Van Dyke, 1964). During this meeting Detlev Bronk influenced Eisenhower that Russia does not possess any missile capability that garners increased funds for space exploration (Launius, 2005 pg.36).

As suggested by Launius, the influence of Detlev Bronk on Eisenhower directly affected NASA’s ability to compete with the Russians in space. Launius proposes, that the effectiveness of NASA’s public relations related to space exploration, diminished due

to Eisenhower's ideology on space exploration. After his meeting with Bronk and Waterman, Eisenhower proceeded to hold a press conference. During the press conference Eisenhower stated he didn't know what all the fuss was about dismissing the launch stating "The Russians have only put one small ball in the air" (Schoettle, 1957 pg. 175). Eisenhower repeatedly stated that "there would be no space race between America and Russia" and that he is not threatened in the least by Russia's launch of Sputnik I (Launius/NASA, 2005 pg.36).

Launius suggests, the meeting held by Eisenhower influenced his message to Americans related to what Sputnik meant for America's super-power status. Furthermore, Launius postulates Eisenhower's preference of military endeavors over space exploration delayed the progress of NASA's space program objectives. In contrast, Heppenheimer's case study describes Eisenhower's support for NASA's aeronautical endeavors like achieving transatmospheric flight and developing an ICBM during this same period.

NASA historian Richard Hallion also argues that aeronautical innovations like re-entry research, nose cone development, and hypersonic flight research led to NASA's achievements during the Mercury, Apollo and ISS programs in the years following Sputnik I (Hallion, 2010 pgs. 8-9). Hallion describes the challenges NASA's aeronautics division endured since NASA's founding despite being NASA's predecessor dating back to 1915 under the NACA (Hallion, 2010 pg. 9). Hallion also supports the other historians mentioned like Heppenheimer and Benson that acknowledge NASA's entire creation can largely be attributed to a global PR crisis like Sputnik, despite initial denials by President Eisenhower (Hallion, 2010 pg. 5).

## **Mercury 7: The first American Astronauts**

When the names of the first astronauts were revealed at 2:00 p.m. on April 9, 1959 hundreds of reporters gathered to photograph the “astronaut volunteers” during a press conference (Launius, 2005 pg.36). The press conference took place at the strategic time of 2:00 p.m. to allow reporters time to “call in” their stories to their newspapers and television stations before their p.m. deadlines (Launius, 2005 pg.38).

While opening the press conference Bonney states “Following the distribution of the kits (press kits)—and this will happen as quickly as possible—those of you who have P.M. deadlines had better dash for your phones.” Bonney adds, “We will have a ten or twelve minute break during which the gentlemen will be available for picture taking. There will be no talk however, then we will reconvene, hoping the P.M. boys have done their file and come back and start the presentation and Q and A.” (Launius, 2005 pg.44). NASA’s Astronaut fact book explains that the initial process of selecting the first crop of “astronaut volunteers” comprised a series of public relations strategies like publicity, advertising and special events (Markemson, 2009 pg 3). NASA’s historical website supports this statement. The original application to become an astronaut published on December 22, 1958 included a news release comprised of NASA’s objectives for its manned spaceflight program (Markemson, 2009 pg 45).

The literature states NASA’s first 500 candidates met the criteria of extensive jet flight and engineering experience. NASA candidates also could not exceed 5’11” in height (Markemson, 2009 pg 37). NASA’s astronaut application states candidates were expected to complete various tasks: perform thorough training sessions and read technical reports, acquire specialized knowledge of equipment, operations, and scientific tests

required for manned spaceflight, physical conditioning, and a variety of tasks performed in low gravity environments. NASA records explain seven men dubbed “The Mercury 7” were finally selected from the initial 500 candidates. Dr. Starr suggests Walter Bonney felt NASA would be an “instrument of U.S. policy,” influencing global opinions of the United States (Starr, 2008 pg. 153). Therefore, it became critical that NASA’s space program allow the maximum amount of access to the media.

Conversely, its aeronautical programs restricted media access to military and industry personnel during this era due to security concerns unless publicity benefited America’s militaristic goals (Markemson, 2009 pg 47).

### **Scientific conferences and research reports**

NASA’s main public relations strategy related to its aeronautics division comprised scientists writing reports in trade journals and communicating the implications of research findings at conferences (Launius, 2005 pg.53). Newsworthy elements of the conferences filtered to science editor’s desks and eventually to newspapers and magazines devoted to aeronautics or aviation ((Launius, 2005 pg.184). Jenkins explains the federal law creating NASA (Launius, 2005 pg.342). required it to practice public relations by communicating its findings to the public and industry. These communication although not targeted to the general public provided a basis for NASA and the military to maintain a public trust (Launius, 2005 pg.123).

To adhere to this law, NASA held conferences to report the findings of cutting-edge research to military and industry professionals and provide scientific rationale for additional funding for future research (Launius, 2005 pg.128). The first of these conferences took place in 1956 under NACA, two years prior to NASA’s creation.



Jenkins explains the topic of the first two of many industry conferences to follow comprised X-15 plane technology.

While most of America focused on the space activities of Russia, President Eisenhower and military brass concerned themselves with Intercontinental Ballistic Missiles (ICBM's) and hypersonic flight (Logsdon, 1970 pg. 18). To achieve hypersonic flight, military aeronautics engineers proposed a new aircraft called the X- plane in 1944, but did not successfully assemble the first models until 1958 (Logsdon, 1970 pg. 24). The 1958 conference hosted aeronautics industry executives from Boeing, North American, Lockheed Martin, and Bell Aircraft Corporation along with representatives from the United States Air Force, Navy and Army (Launius, 2005 pg.143).

### **Target Audiences**

The proper message, audience, and channel NASA uses vary according to its target public. For NASA's aeronautics division, its target public comprises military and defense contractors, aeronautical/ aerodynamics engineers, aircraft manufacturers, and federal aviation administration officers (Painter, 2010 pg. 420). NASA's manned spaceflight division audiences span from the general public to legislators, journalists, scientists, international space programs and foreign governments. This thesis focuses on NASA's media relations strategies of its aeronautics and manned spaceflight divisions and the relationship of those strategies to U.S. space policy. According to Historian Roger Launius, NASA implements its program of action and communication designed to achieve specific objectives for each of its publics to accomplish its goals.

### **Target Audience 1: United States Congress**

As stated earlier, NASA must report to congress on a regular basis. Congress appropriates budgets and regulates NASA's activities. Although Congress has hundreds of members, a select few have the majority of influence on NASA- The US House Committee on Science, Space and Technology (Launius, 2005 pg.183). This legislative group is vital to NASA's operations; therefore, it must be considered as NASA's most important target audience.

### **Target audience 2: President of the United States**

#### **President Dwight D. Eisenhower era**

The successful launch of Sputnik I by Soviet scientists became an undeniable scientific triumph in the minds of people across the world (Van Dyke, 1964 pg.17). This achievement took place under President Eisenhower whom was specifically interested in Russia's technology related to ballistic missiles with the capability of reaching America or its allies (Van Dyke, 1964 pg.34).

Historian Van Dyke indicates in his book *Pride and Power* that Eisenhower's ideology on spaceflight was one of "calm conservatism." However, Kristen Starr states Eisenhower, NASA Public Information Officer Walter T. Bonney, and NASA's first Administrator Dr. T. Keith Glennan crafted a message of "America-first globalism" that would quietly become NASA's mantra throughout the "space race" (Starr, 2008 pg. 140). The panicked reaction of America's citizens and more importantly its Congress, persuaded Eisenhower to fund the necessary aeronautical research to not only build his beloved (ICBM), but also placed America's first satellite into orbit (Launius, 2007 pg. 39). Ironically, NASA's Marshall Space Flight Center historical record titled *Marshall*

*Milestones*, admit the great American triumph came about in large part due to the efforts of German-born scientists James van Allen and Wherner von Braun (Launius, 2007 pg. 39).

After working with the U.S. Army during the 1940s to develop missile systems based on the German V-2 rocket, von Braun helped successfully launch the first American satellite via the Jupiter-C rocket on Dec. 31, 1958 (Launius, 2007 pg. 87). Stephen J. Dick, NASA's chief historian, says von Braun graced the cover of Time magazine for his accomplishments. According to historian Dr. Launius this style of message framing helped NASA get budget increases and mounds of publicity for its space program while simultaneously receiving military backing for its aeronautics division privately (Launius, 2007 pg. 169).

### **President John F. Kennedy Era**

Increasing funding for manned spaceflight became a top priority of President Kennedy in the initial days of his administration (Gabrynowicz, 2004 pg. 17). However NASA still needed to complete its aeronautical research to achieve its manned spaceflight goals (Gabrynowicz, 2004 pg. 136). NASA official James Webb, reports the need to increase funding for manned spaceflight was a high priority at President Kennedy's cabinet meeting held on March 22, 1961.

During this pivotal meeting many of Kennedy's staff were briefed on the benefits and history of the space program and were urged to consider the implications of America's failure to keep up with the Russians (Gabrynowicz, 2004 pg. 56). Webb proposes the effectiveness of NASA's briefings with President Kennedy about the significance and urgency of the Apollo program provides a blueprint for relationships

between NASA and future Presidents (Gabrynowicz, 2004 pg. 286). Failure to beat Russia in placing a man on the moon could have permanently placed Russia at the apex of global dominance (Logsdon, 1970 pg. 237). Logsdon states, this premise directly relates to NASA's external public relations strategy. Kennedy's understanding of the political significance of the Apollo mission vastly improved NASA's ability to complete its objectives.

According to Logsdon, President Kennedy's speeches and budget proposals were influenced by briefings Kennedy received from NASA and Academy of Science officials. Dr. Logsdon's literature also explains that the Apollo program was the largest collective effort using science and technology to complete a foreign policy goal in America's history (Logsdon, 1970 pg. 34). This statement confers with Walter Bonney's thoughts of NASA being an instrument of U.S. policy (Starr, 2008 pg. 143). Once again, NASA used aeronautical research to achieve its space goals. To achieve Kennedy's goal of placing an American on the moon by the end of the decade, NASA relied on its aeronautical program to develop the technology.

### **President Ronald Reagan Era**

America's involvement with the International Space Station was directly affected by political factors (Starr, 2008 pg. 143). According to Starr, an American President would once again be compelled to balance issues like national interest and scientific discovery. In the same manner that President Kennedy directed NASA to put a man on the moon "by the end of the decade" NASA was directed by President Reagan in his 1984 State of the Union address to build the International Space Station "by the end of the decade" (Starr, 2008 pg. 143).

During this speech Reagan stated that America would build the ISS to further the possibilities for peace, science, and permanent human presence in space (Reagan, 1984 pg.1). The goals of Presidents Kennedy and Reagan seem different on their face; however, the literature proposes that Reagan used different messaging to achieve the same goal as Kennedy.

### **President Barack Obama Era**

Literature on the Obama administration's relationship with NASA reveals a possible return to the "cautious conservatism" exhibited by President Eisenhower. Dr. Pace, director of the National Space Policy Institute at George Washington University stated in 2011, "The Obama Administration had sought to cancel the Constellation program and terminate existing contracts with the Fiscal Year 2011 NASA budget. However, this dramatic change of course was not accompanied by a clear explanation of what would replace Constellation. In particular, there were no concrete explanations of how the transition away from the Space Shuttle would be implemented, support for the International Space Station assured, or human explorations beyond Earth orbit conducted" (Pace, 2011pg. 1).

### **Target audience 3: Aviation / Aerospace Industry and U.S. Military**

Because government agencies like NASA rely on federal budgets for their existence, NASA's role in capturing the imaginations of Americans through publicity with front page photos of astronauts and launches during its early years cannot be understated. Historians John Logsdon and Lawrence Benson, suggest Eisenhower's need to reassure American citizens that Sputnik had no effect on American dominance drove the decision to heavily publicize the start of NASA and its first crop of astronauts

(Hallion 2010 pg. vii). Conversely, NASA's aeronautics division quietly worked on the re-entry and missile research that would make the space related goals of NASA possible and the defense related goals of the President and military tangible. The public relations strategies of NASA's aeronautical division during the Mercury-era rarely involved the general public being the target audience (Hallion, 2010 pg. 301). Nonetheless, the military, aeronautical engineering, and defense contract industries were heavily influenced by the findings of NASA's aeronautics research (Paté-Cornell, Dillon, 2001 pg.4)

#### **Target Audience 4: NASA Employees**

Employee communication enables an organization to send and receive information throughout the company. The hierarchal organizational structure used by corporations all over the world dictates that directives and policies flow from the top-down, but feedback about these directives and policies flow bottom-up (Cutlip, Center, Broom 2009 pgs. 226-228).

Broom explains employee communication takes place in two formats mediated and unmediated. Unmediated forms of employee communication like the "grapevine" allow information to be passed on quickly, however this information can be unreliable or enhanced. This informal, unfiltered form of communication takes place in almost all organizations and people who employees feel have access to top management become important distributors of the latest and most reliable information. Broom states that research revealed the grapevine ranked second only to immediate supervisors as employees' main source of organizational information.

Furthermore, Broom explains the grapevine can become a dangerous source of communication in an organization if the messages that pass throughout the grapevine consist of “misinformation”. Rumors of layoffs or mergers spread like wildfire and may cause anxiety and even anger before the information becomes verified for validity. Meetings, teleconference, and videoconferences allow for face-to face or group communication. According to Broom, these methods have more reliability of validity than the grapevine, but can become expensive if they require travel or technology costs to maintain electronic communication systems like videoconferences or conference calls (Broom, 2009 pgs. 226-228).

Mediated forms of employee communication like employee publications have become the most utilized method for organizations to communicate with their employees. These forms of communication like newsletters, bulletin boards, e-mail, intranet, and website are inexpensive and far more reliable than the grapevine (Broom, 2009 pgs. 226-228).

Employee communication programs have five major goals: (1) Keeping employees informed of the organization’s strategy and goals. (2) Providing employees the information they need to perform their assignment well. (3) Encouraging employees to maintain and enhance the organization’s standards for and commitment to quality improvement, increased efficiency, improved service, and greater responsibility. (4) Recognizing employees’ achievements and successes. (5) Creating an opportunity for two-way communication to generate employee feedback, questions and concerns (Broom, 2009 pgs. 226-228).

## **Target Audience 5: The American Public**

One of the most important audiences for NASA is the public. Schierholz states, “As usual, our team has excelled at using social media in a way that benefits the Agency and the taxpayers who fund us.” (Schierholz/ IT Talk 2011 pg.4). For more than five decades, NASA has communicated with the public. The following paragraphs describe the methods NASA has used to communicate.

### **Channels**

Once NASA Public Information Officers develop the right message and segment its audience, NASA then disseminates its messages and content across a full spectrum of channels (Schierholz/ IT Talk 2011 pg.4). Thomas O’Guinn, Chris T. Allan and Richard Semenik, authors of *Advertising and Integrated Brand Promotion* suggest that all channels of communication have advantages and disadvantages. The following paragraphs will describe each channel followed by an analysis of NASA’s use of each channel or “vehicle”.

### **Print Media-Newspapers**

According to the Newspaper Association of America, approximately 52 % of adults in the United States read a newspaper everyday (www.nnn-naa.com, 2007). However, this organization also reports that 78 % of this same group read the newspaper daily in 1970. While newspaper readership has declined, it still has a large enough audience to influence various audiences (Allen, O’Guinn, Semenik, 2009 pg. 488). Therefore, NASA still includes print media in its media relations tactics (Schierholz/ IT Talk 2011 pg.4).



## **Advantages of Newspapers**

Newspapers have certain advantages over other forms of media such as:

- (1) Geographic selectivity- newspapers allow PR practitioners to pitch stories to newspapers in key markets or small towns (Allen, O'Guinn, Semenik, 2009 pg. 488-490).
- (2) Timeliness- newspapers with daily or morning and afternoon editions are able to relay information to the public in a timely manner (Allen, O'Guinn, Semenik, 2009 pg. 488-490). Therefore, NASA uses newspapers to reach its audience.
- (3) Creative opportunities- Newspaper layouts offer journalists an opportunity to tell a story through words, graphics and pictures.
- (4) Credibility- public perception of major newspapers and journalists remains positive (Allen, O'Guinn, Semenik, 2009 pg. 489). Therefore, newspapers serve NASA as a credible source to disseminate information (Schierholz/ IT Talk 2011 pg.4).
- (5) Audience interest- regular readers of the newspaper are truly interested in this channel. As stated earlier, newspaper readership may be down, but newspapers still interest the remaining audience (Allen, O'Guinn, Semenik, 2009 pg. 490).

## **Disadvantages of Newspapers**

- (1) Limited Segmentation- Newspapers can segment an audience geographically, but they also designed cover a broad spectrum of society. Therefore, newspapers can make it difficult to target a specific audience (Allen, O'Guinn, Semenik, 2009 pg. 490).
- (2) Creative Constraints – Newspapers have a journalistic purpose that constrains them to limited uses. For example, newspapers advertise, inform and report information to a public, but they have been known to produce poor color quality and some do not print in color. Therefore, a organization's message may not make the impact it desires (Allen, O'Guinn, Semenik, 2009 pg. 491).
- (3) Short shelf life- because newspapers are printed

daily their shelf life is very short. Therefore, messages communicated through this channel must be current and relevant (Allen, O'Guinn, Semenik, 2009 pg. 491).

### **Print Media-Magazines**

As stated earlier, NASA cannot spend money on “publicity” unless specifically allowed by Congress due to the Gillet Amendment to a 1913 U.S. House of Representatives appropriation bill (Broom, 2009 pg.16). According to the literature, NASA's Public Information Office overcame this legislative hurdle during NASA's early years by striking strategic public relations partnerships (Starr, 2008 pg.250-252).

McCurdy states in another book *Space and the American Imagination*, the most influential of these partnerships was the LIFE magazine contract (McCurdy, 1997 pg. 88). According to McCurdy, NASA officials and LIFE magazine editors carefully crafted the images of the Mercury 7 in the same manner a PR director would who worked with a rock star (McCurdy, 1997 pg.88-90).

McCurdy and Starr say the partnership worked well with NASA's “America-first” ideology and LIFE magazines founder Henry Robinson Luce's conservative, yet sometimes propagandist vision (Starr, 208 pgs. 251-252). Kristen Starr, reports Luce's philosophy worked well with NASA's messaging.

NASA's historical archives contain speeches from NASA Public Information Director Walter T. Bonney and NASA administrator Keith Glennan, promoting NASA's space program as a symbol of our great democracy that would defeat the “evil” communist Russia (Starr, 2008 pgs.250-255). NASA's media relations department grants access to reporters and journalists that work with magazines in several categories

all across the world. Additionally, NASA publishes many magazines itself including IT Talk, which focuses on technology and trends in communication at NASA.

### **Advantages of Magazines**

Magazines have many advantages such as: (1) Audience selectivity- magazines attract specific audiences. Therefore, when NASA grants a magazine an interview or photo opportunity, it can be assured that the messages and symbols of the coverage will reach a certain audience (Starr, 2008 pgs.250-255). (2) Audience Interest- the content of a magazine serving a specific audience can be relied upon to retain the interest of that audience (Allen, O'Guinn, Semenik, 2009 pg. 498). (3) Long shelf life- Because magazines are usually released monthly or quarterly, they allow messages to have a longer shelf life than newspapers or social media (Allen, O'Guinn, Semenik, 2009 pg. 498).

### **Disadvantages of Magazines**

Although magazines have certain advantages, they also have some disadvantages such as: (1) Limited reach and frequency- magazines only reach a select amount of individuals. Even the most popular magazines like LIFE and National Geographic only reach a fraction of the general public (Allen, O'Guinn, Semenik, 2009 pg. 491). (2) Long lead times- Some magazine editors require their writers to submit copy as much as 90 days in advance. Therefore, this channel would not be appropriate for messages that require timeliness (Allen, O'Guinn, Semenik, 2009 pg. 499).

## **Press Kits**

Press kits are another print media channel used by an organization to communicate its messages. These messages are communicated to journalists and members of the media and then those messages and symbols are communicated to a specific audience or the general public (Bagin and Fulginiti, 2005 pg.111-114).

Organizations include news releases, photos, fact sheets, contact information, and any other documents deemed newsworthy (Bagin and Fulginiti, 2005 pg.111-114). NASA provides members of the media with press kits related to all its activities (Schierholz/ IT Talk 2011 pg.4).

## **News releases**

News releases are another form of widely used print media and a staple of any press kit. NASA distributes numerous news releases through traditional and social media channels (Schierholz/ IT Talk 2011 pg.4). News releases communicate an organization's activities to various publics. The media receive the press release in physical or digital copy and decide whether or not to include the release to its publication or website (Bagin and Fulginiti, 2005 pg.111-114).

## **Broadcast media**

### **Television**

Television offers communicators the option of including sight, sound color and music to their messages. Television is also very popular attracting millions of viewers across wide spectrums. Television offers communicators two benefits: flexibility and reach (Allen, O'Guinn, Semenik, 2009 pg. 498). According to Historian Kristen Starr, NASA has used television to communicate with the world since its inception in 1958.

NASA provides journalists with media passes to all of its public events and press conferences. According to Historian Ron Miller, television has helped NASA play a key role in American pop culture (Miller/NASA, 2005 pg.509).

Miller's writings on the societal impact of spaceflight state "a recent collectibles catalog lists more than 300 toys inspired by the most popular children's television space shows of the 1950s: *Space Patrol*, *Captain Video*, *Tom Corbett*, and *Rocky Jones*.

The aforementioned television shows are not affiliated with NASA; however, they still suggest space-themed television programming played a key role in persuading public opinion on spaceflight and eventually NASA's activities in space (Miller/NASA, 2005 pg.509). Historian Roger Launius explains that the moon landing in July, 1969 which was witnessed on television, was an event that became a turning point in human history (Launius, 2005 pg.36). Launius reports in his book *The Societal Impact of Spaceflight*, that President Nixon once told an audience that the dates surrounding Apollo 11 were the most important in the history of Earth since the creation (Launius, 2005 pg.36).

This claim is supported by a 1999 opinion poll titled *Top 25 News Stories of the Twentieth Century*, rated the moon landing second only to the United States dropping an atomic bomb (Launius, 1999 pg.2). Unfortunately, the vehicle of television has played a role in some of NASA's tragedies as well. According to R.M. Martin and L.A. Boynton, authors of *From liftoff to landing*, the disasters of Space Shuttles Challenger and Columbia were both witnessed on television by audiences across the world (Boynton and Martin/ PR Review, 2005 pg. 255). Additionally, Martin and Boynton make the following claim in their 2005 journal article in *Public Relations Review*: "The *Challenger* explosion, although not the first NASA mission resulting in loss of life, was the most

horrific event in the history of the United States space program—until it happened again.” (Boynton and Martin, 2005 pg. 254).

### **Categories of Television**

Television programming is broadcast in several forms: Public, For Profit/Public and Subscription-based (Allen, O’Guinn, Semenik, 2009 pg. 499). Public television is broadcast free of charge to the public. Public television stations can be owned by corporations or non-profit groups; however, advertisers are not allowed to purchase airtime for commercial advertisements. This format of programming serves the public by educating society and ensuring that everyone has access to mass media (Allen, O’Guinn, Semenik, 2009 pg. 502).

For-profit/Public television broadcasts its programming to the public free of charge; however, it charges fees to advertisers.

Subscription-based television charges both advertisers and viewers (Allen, O’Guinn, Semenik, 2009 pg. 503). Recently, NASA launched its own television network called NASATV. This network allows NASA to communicate its own messages directly to the public (Nanda, 1986 pg. 12).

### **Radio**

Another widely used channel or vehicle of broadcast media is radio. Radio programming entertains, educates and informs society everyday (Allen, O’Guinn, Semenik, 2009 pg. 503). Radio reaches billions of people across the world; therefore, organizations often distribute news releases to journalists to be communicated through radio (Allen, O’Guinn, Semenik, 2009 pg. 503). According to a 2011 press release, NASA launched Third Rock Radio on December 12, 2011. NASA titled Third Rock

“America’s Space Station” and said the radio station would play Rock, Indie and Alternative music. David Weaver, associate administrator for the Office of Communications at NASA Headquarters in Washington, stated during the press conference "We have led the way in innovative uses of new media and this is another example of how the agency is taking advantage of these important communication tools." (Nanda, 1986 pg. 12).

Radio programming is broadcasted in many formats including AM, FM and Internet. AM band radio broadcasts news and entertainment programming. FM band radio programming also broadcasts news and entertainment. Internet radio broadcasts similar programming as its predecessors, but this format does not have the geographical limitations of traditional radio.

### **Social Media**

The public’s use of the internet has evolved into a form of communication called social networking (Allen, O’Guinn, Semenik, 2003 pg. 549). Media scholars suggest that social media has transformed members of the public into important members of the media. According to Lon Safko, author of *The Social Media Bible*, defines social media as “the media we use to be social” (Safko, 2010 pg.3). This form of communication comprises individuals or groups of individuals communicating with each other on platforms like Facebook, Twitter, YouTube, Blogs, instant messaging services and others (Allen, O’Guinn, Semenik, 2009 pg. 549).

Furthermore, Safko explains that there are five keys to successfully communicating on social media: (1) Examine your existing media- organizations should look at all the forms of media they are currently communicating through and calculate the expense of

each channel. (2) The Social Media Trinity- users should focus on blogging, micro-blogging and social networking websites. (3) Integrate strategies- organizations should integrate the aforementioned elements of the social media trinity and include each element in its marketing plan. (4) Resources-organizations should allocate resources for social media in its budget. (5) Implementation and measurement- organizations should implement a social media strategy and then measure the results to evaluate the campaigns effectiveness (Safko, 2010 pg.xvi). According to Safko, members of social networking websites gain prominence according to how many “followers” or “friends” they accumulate. Stephanie Schierholz states that NASA’s main Twitter account: “@NASA” has over one million followers.

### **NASA’s use of Social Media**

NASA has thousands of employees and must communicate effectively to operate efficiently. James McClellan, JSC chief technology officer, explains that NASA has over 300,000 “likes” on Facebook and achieved the first social communication from space via Foursquare.com (Cureton et al, 2011 pg.4).

NASA’s current use of social media allows it to communicate instantly with multiple divisions in real-time. Stephanie Schierholz, NASA’s former Social Media Manager, stated the following in a 2011 article, “If you are now thinking of ways you could use social media to share your story, work with your public affairs officers in advance to design a strategy that will ensure you are not only effective but also following established communication policies and complying with NASA and Government standards for legal, security, records management, and more. The very efficient nature of the medium that allows us to spread the word quickly about the great work we're doing



also requires us to be more vigilant to ensure what we share is accurate, true, and public information.” (Cureton et al, 2011 pg.4).

In recent years, NASA has employed the use of social media to reach its target audiences. NASA evolved from relying on traditional broadcast media platforms like television, newspaper and radio to now broadcasting their own messages through their own channels like NASATV, Twitter, YouTube, Ustream and its website NASA.gov (Cureton et al, 2011 pg.4). Schierholz supports this statement in the aforementioned article, “Social media sites are valuable tools that have enabled NASA employees to engage the public through media that spread the word efficiently and effectively.” (Cureton et al, 2011 pg.4).

These platforms allow NASA to conduct all the media relations they have in the past without worrying about if their target audience will receive the messages the way NASA intended them to (Cureton et al, 2011 pg.4). However, there are certain rules NASA must follow when using social media. James McClellan, JSC chief technology officer, states that NASA employees should follow rule 17 of the NASA guidelines for its employee’s use of social media, “Do not use a public social media service for a NASA-related activity or discussion that is not meant for total public access.

If the topic is not for release to the public, use an internal social media tool.” (Cureton et al, 2011 pg.4). Media Relations staff at NASA use several twitter accounts to reach various communities like scientists, schoolchildren, traditional media and industry.

As stated earlier, NASA’s primary Twitter account has more than one million followers (Cureton et al, 2011 pg.4). However, NASA uses Twitter for several different uses. One of the most efficient uses is the NASA “Tweeup”. During these events,

followers of NASA's twitter account are invited to panel discussions and press events and report activities, ask questions and relay information via twitter to their individual followers. Stephanie Schierholz explains this process by stating, "NASA Tweetups take it to the next level—bringing the online engagement to in-person gatherings where participants have an opportunity to talk to NASA leaders, scientists, engineers, and astronauts and the chance to see how and where we work. Participants have arrived at NASA Tweetups as casual fans or followers and walked away as enthusiastic advocates of the work we all are doing." Schierholz added, "A strong sense of community develops at these events, exemplifying how social media can bring together people who have common interests" (Cureton et al, 2011 pg.4).

These methods are far less expensive than printing thousands of press kits to NASA's global network of researchers, employees, media, and fans (Cureton et al, 2011 pg.4). NASATV is broadcasted on the internet, satellite and cable channels. NASATV allows NASA to broadcast its activities on Earth and International Space Station (Cureton et al, 2011 pg.4). NASATV allows NASA to conduct global press conferences with international astronauts on the ISS. These strategies align with NASA's new international planning and operations (Cureton et al, 2011 pg.4).

Over the last 50 years, NASA has had both good and bad relationships with the media. Two of the most pivotal shifts in the relationship between NASA and the media occurred during the Challenger and Columbia disasters (Martin and Boynton, 2005 pg.259). According to Martin and Boynton, NASA media relations efforts were

ineffective and bordered on incompetent during the challenger disaster but improved during the Columbia disaster (Martin and Boynton, 2005 pg.257).

In a 2005 journal article, Miller cites an assessment of NASA's media relations by the Columbia Accident Investigations Board following the two tragedies "NASA's public relations effort following the explosion of the space shuttle *Challenger* is widely considered a textbook example of a crisis communications failure. After the *Columbia* disaster, however, NASA public affairs officials received praise as well as criticism for a more successful handling of the crisis" (Cabbage & Harwood, 2004).

This quote suggests that many of the missteps NASA made during the challenger disaster. Further evidence can be found in the accident committee's analysis of the tone of media coverage following each disaster, "When NASA refused to speculate on post-*Challenger* events, however, media personnel often bypassed agency officials and talked to professors, engineers, and other professionals who were happy to speculate.

Reporters indicated that NASA officials alienated themselves from the media by not discussing particulars of the investigation. In contrast, news reports in the first week following the disaster were more favorable toward NASA officials who cautiously speculated after the *Columbia* explosion. Officials discussed what possibly caused the shuttle explosion, and what the investigation boards were focusing on as suspected causes. Thus, NASA was able to focus the media on what the agency had to say on a daily basis in 1986, it corrected before its response to the Columbia disaster in 2003. Unfortunately, NASA suffered a loss in confidence from the public and legislators relating to the safety of space shuttle missions (Martin and Boynton, 2005 pg.259).

The literature suggests a loss of public confidence in the safety of NASA's confidence had a factor in President George W. Bush's 2003 announcement that the Space Shuttle Program would permanently end in 2010 (Martin and Boynton, 2005 pg.262).

According to Markemson, NASA's five public relations challenges are as follows:

(1) NASA's purpose comprises colonizing space- Markemson explains that U.S. foreign policy directed the agencies vision from its inception in 1958. Historians Logsdon and Heppenheimer specifically point to Sputnik's launch as a major factor in the passage of the American Space Act in 1958 transforming the National Advisory Committee on Aeronautics (NACA) to the National Aeronautics and Space Administration (NASA). Although NASA widely publicized the space division of NASA for political purposes, aeronautics still was a priority (Hallion, 2010 pgs 8-9).

Benson's case study confers with this statement explaining NASA initiated its Super Sonic Transport (SST) program aimed at enhancing the possibilities of supersonic flight, one year before presenting the first astronauts to the world in a 1959 press conference.

(2) NASA's operations entail extraordinary expense- Markemson states NASA's budget at the height of the Apollo program consumed more than 4% of the federal budget during the 1960's. However, NASA's budget of 18.5 billion for fiscal year 2011 consumes only 0.5% of the total 3.7 trillion dollar federal budget. In addition, Markemson, states in 2010 Americans spent the equivalent to NASA's budget on pet food (Markemson, 2011 pg.1).

(3) NASA's research is useful only in space- Markemson explains how algorithms used in the Hubble telescope enhanced the field of mammography. Moreover, Markemson describes numerous examples of NASA research equipment helping in times of disaster. Hence, NASA's research adds to human knowledge.

(4) NASA stands in the way of private enterprise in space- Markemson, quotes Newt Gingrich's comments about NASA during a 2011 GOP Presidential debate, "NASA ought to be getting out of the way and encouraging the private sector," said Gingrich. Conversely, Markemson argues that most of NASA's missions lack commercial viability. Hence, they couldn't be a prohibiting element to private ventures in space tourism or telecommunications.

(5) The American space program still leads the world- Markemson states that nine other countries including India, Israel and Iran have launched payloads into orbit. Furthermore, 50 countries contribute to the use of satellites without U.S. involvement. The literature suggests, for NASA to overcome the perception of these myths it must employ persuasion theory (Markemson, 2009 pg. 254).

### **Chapter 3 Methodology**

To add to the body of knowledge, the author collected original data related to NASA's media relations strategies. The following paragraphs explain the type of data collected, sources of data collected, and means used to acquire the data.

To ensure the universe reflects a cross-section of qualified volunteers, the author designed a non-probable study with a proportional sample. The author designed this study to reveal the knowledge, attitude, and behavior of survey respondents related to NASA's media relations.

Revealing these elements provided the author with a better understanding of the relationship that exists between various NASA media relations strategies and variables like U.S. space policy. As discussed in the delimitations section of chapter one, the author did not extrapolate this study's findings to the entire population of NASA employees, space journalists, PRSA fellows, or members of the media who cover NASA events through various channels.

#### **Research Design**

The author designed this study to probe respondents on their attitude and toward various NASA media relations strategies and tactics. These findings revealed how NASA's target publics perceive the organization and their media relations as a whole. Additionally, the author designed this study to reveal findings that could enhance the author's understanding of NASA's perception of its media relations activities as compared to the public's perception of those activities.

## **Sample**

To collect the necessary data, the author pulled a sample of 300 qualified volunteers to create a universe reflecting a cross section of involvement with NASA media relations. The author completed 105 surveys from this universe. The author selected a stratified sample of qualified volunteers who participated in the study.

The criteria to be considered a qualified volunteer are listed below:

1. NASA employee
2. Traditional space journalist who covers NASA events
3. Internet space journalist who covers NASA events
4. Active followers of NASA on social media websites
5. PRSA fellows with experience in media relations

## **Sampling method**

Because various sections of the universe have more potential subjects than others, the author included 60 subjects from each strata of the universe to construct a uniform quota sample. The 60 subjects were selected according to a predetermined sampling interval of five.

## **Sampling Interval**

In adherence to the scientific parameters of systematic random sampling, the author sampled one subject out of every five members of the universe. This interval allowed the author to sample approximately 60 subjects from each of the five aforementioned strata.

## **Study Structure**

### **Type of Data Collected**

To properly assess the efficacy of NASA media relations strategies, the author designed a survey instrument to reveal the cognitive, attitudinal, and behavioral of the participants. The items displayed below, describe the study structure. For the purposes of this study, the author defined the term *latent* as underlying or pre-existing knowledge or attitudes of survey respondents.

### **Information Probed**

- NASA employee latent knowledge of public perception of NASA prior to President Kennedy's speech about putting an American on the Moon.
- NASA employee latent knowledge of public opinion prior to the decision to end the Apollo missions.
- NASA employee latent knowledge relating to the efficacy of certain media relations strategies to sway public opinion.
- NASA employee latent knowledge of the efficacy of NASA's website.

### **Attitudinal**

- Respondent's attitude toward NASA's dissemination of content through digital media channels in addition to traditional media channels such as broadcast media and print media.
- Respondent's attitude toward NASA's access to internet journalists (bloggers, podcasters, Youtube, Twitter).
- Respondent's attitude toward NASA's communication with the public of its activities.
- Respondent's attitude toward NASA's use of social media to disseminate information.
- Respondent's attitude toward NASA's publicity of its ISS activities



- Respondent's attitude toward NASA's use of NASATV as a platform to communicate with the public.
- Respondent's attitude toward the functionality of NASA's website.
- Respondent's attitude toward NASA's relationship with the media since the Apollo program.

## **Behavioral**

1. How does NASA use mass media to communicate with the public?
2. How much access does NASA grant internet space journalists vs. traditional space journalists?
3. How has NASA's use of mass media changed over the past five decades?
4. How does NASA use social media?
5. How has NASA's relationship with the media changed since the Apollo program?
6. How does NASA's media relations strategies influence target audiences like Congress, U.S. military, aerospace industry, university researchers, and the general public.

## **Source of the data collected**

### **NASA Employees (Interviews)**

- Dwayne Brown, Head of Policy Program Management- NASA
- NASA Media Communication Staff (Media relations and Public Information Officers)
- NASA Historians with expert knowledge of NASA media relations from 1958 until today.

### **Planetary Society**

- Mat Kaplan - Media Relations Director

### **PRSA Fellows (Delphi Study)**

- Members of the Public Relations Society of America with expert knowledge of media relations

### Space Journalists (Survey)

- Traditional- Newspaper, Radio, Television
- Internet- Bloggers, NASA” Tweetup” followers, Facebook

### **Means used to acquire data**

**Survey-** A 21-item survey was distributed to 300 respondents to reveal their perception of the efficacy of NASA’s media relations strategies during the Mercury, Apollo, and ISS programs. Both Likert and Guttman Scales were used to enhance the survey instrument’s validity.

### **One on one Interviews with media relations personnel -**

The author conducted five individual interviews with NASA Public Information Officers, Communication Staff and Program Directors/Administrators

**Delphi Study** – the author invited 12 PRSA fellows to participate in a Delphi Study comprising of 2-3 rounds. Of the 12 invited nine participated in the study and six Fellows actually completed the study. During the first round, respondents answered three questions related to media relations and social media. After the first round, respondents were allowed to see the most popular responses in order to form a consensus.

## **Chapter 4**

### **Data collection results**

#### **Survey**

During the original data collection phase of this thesis the author created a 21-item survey. This survey was administered electronically and attracted 178 respondents with 105 completing the entire survey. The following paragraphs explain percentages and frequencies collected for each survey question.

#### **Q1. How would you describe your relationship with NASA?**

<i><b>Order</b></i>	<i><b>Item</b></i>	<i><b>Frequency</b></i>	<i><b>Percent</b></i>
1	Astronaut for NASA	1	1
2	Administrator for NASA	1	1
3	Follower of NASA on social media	53	40
4	Outside member of the media	14	11
5	Public Information Office at NASA	7	5
6	Scientist working directly for NASA	3	2
7	Scientist working for an independent agency/organization	11	8
8	Other type of NASA employee or affiliate	43	32
<b>Total</b>		<b>133</b>	<b>100%</b>

#### **Q1. Analysis**

These findings reveal 40 percent of respondents identified themselves as followers of NASA on social media. Additionally, 11 percent of respondents identified themselves as outside members of the media and 32 percent of respondents identified themselves as other type of NASA employee or affiliate.

**Q1a. If you answered D to question 1, which media outlet do you work for?**

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	Local Newspaper	2	6
2	National newspaper	3	11
3	Local Television Station	1	4
4	Cable News Station	1	4
5	Science Website	3	11
6	Independent Blogger/ Journalist	18	64
<b>Total</b>		<b>28</b>	<b>100%</b>

**Q1a. Analysis**

These findings reveal 64 percent of respondents identified themselves as independent blogger / journalist. Additionally, journalists who work for national newspapers and science websites were tied at 11 percent. Local television and cable television journalists were also tied at 4 percent.

**Q2. How often do you monitor NASA activities online?**

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	Daily	61	52
2	Weekly	18	15
3	Monthly	18	15
4	Few times per year	10	9
5	Never	10	9
<b>Total</b>		<b>117</b>	<b>100%</b>

**Q2. Data Analysis**

These findings revealed that 52 percent of respondents said they monitor NASA activities online daily. Respondents who monitor NASA activities online weekly and monthly were tied at 15 percent. Respondents who monitor NASA activities online only a few times per year or never were tied at 9 percent.

**Q2a. How often do you monitor NASA activities via print media?**

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	Daily	16	14
2	Weekly	18	15
3	Monthly	16	14
4	Few times per year	67	57
<b>Total</b>		117	100%

**Q2a. Analysis**

These findings revealed that 57 percent of respondents said they monitor NASA activities via print media a few times per year. Additionally, 15 percent of respondents said they monitor NASA activities via print media weekly. Respondents who monitor NASA activities via print media daily and monthly were tied at 14 percent.

**Q3. Which of the following channels do you use the most to follow NASA activities?**

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	Cable TV News broadcast	10	9
2	Magazines	1	1
3	Newspapers	7	6
4	Local News broadcast	6	5
5	NASATV	8	7
6	NASA Social Media Website	29	25
7	Internet News Website	56	48
<b>Total</b>		<b>117</b>	<b>100%</b>

**Q3. Analysis**

These findings revealed that 48 percent of respondents said they use internet news websites the most to follow NASA activities. Additionally, 25 percent of respondents said they use a NASA social media website to follow NASA activities. Conversely, only 1 percent of respondents said they use magazines to follow NASA activities while only 6 percent of respondents said they use newspapers to follow NASA activities. Additionally, 5 percent of respondents said they use local news broadcasts to follow NASA activities. However, 7 percent of respondents said they use NASATV to follow NASA activities.

#### **Q4. The media does a thorough job in covering stories about NASA**

*(Semantic Differential scale)*

<i><b>Order</b></i>	<i><b>Answer</b></i>	<i><b>Frequency</b></i>	<i><b>Percent</b></i>
1	<b>(1 Strongly Disagree)</b>	11	10
2	2	12	11
3	3	21	19
4	4	26	23
5	5	23	20
6	6	9	8
7	<b>(7 Strongly Agree)</b>	11	10
<b>Total</b>		<b>113</b>	<b>100%</b>

#### **Q4. Analysis**

These findings reveal 23 percent of respondents rated the media's coverage of NASA stories in the neutral range of 4. Only 10 percent of respondents strongly disagreed with the statement that the media does a thorough job of covering stories about NASA.

Interestingly, 10 percent of respondents strongly agreed with the statement that the media does a thorough job in covering stories about NASA. Overall, more respondents disagreed (40 percent) with the statement that the media does a thorough job in covering stories about NASA than agreed (38 percent).



**Q5. NASA effectively uses social media such as Facebook and Twitter to keep publics informed about the agency.**

*(Semantic Differential scale)*

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	<b>(1 Strongly Disagree)</b>	6	5
2	2	8	7
3	3	14	13
4	4	14	13
5	5	18	16
6	6	20	18
7	<b>(7 Strongly Agree)</b>	31	28
<b>Total</b>		<b>113</b>	<b>100%</b>

#### **Q5. Analysis**

These findings reveal 28 percent of respondents answered “Strongly Agree” with the statement NASA effectively uses social media such as Facebook and Twitter to keep publics informed about the agency. Surprisingly, only 5 percent of respondents answered “Strongly Disagree”. Overall, a cumulative majority of respondents (62 percent) agreed with the statement posed in Q5. Conversely, a cumulative 25 percent of respondents disagreed with the statement posed in Q5.

**Q6. NASA officials provide the science media with sufficient information about the organization.**

*(Semantic Differential scale)*

<i>Order</i>	<i>Answer</i>	<i>Frequency</i>	<i>Percent</i>
1	<b>(1 Strongly Disagree)</b>	8	7
2	2	2	2
3	3	14	13
4	4	22	20
5	5	22	20
6	6	19	17
7	<b>(7 Strongly Agree)</b>	23	21
<b>Total</b>		<b>110</b>	<b>100%</b>

#### **Q6. Analysis**

These findings reveal 20 percent of respondents either slightly agreed with the statement posed in Q6 or were neutral. However, 21 percent of respondents answered “Strongly Agree”. Conversely, only 7 percent of respondents answered “Strongly Disagree”. Overall, a cumulative (58 percent) of respondents agreed that NASA officials provide science media with sufficient information about the organization.

**Q7. NASA’s media relations have an influence on the way Congress votes on NASA related issues.**

*(Semantic Differential scale)*

<i><b>Order</b></i>	<i><b>Answer</b></i>	<i><b>Frequency</b></i>	<i><b>Percent</b></i>
1	<b>(1 Strongly Disagree)</b>	6	6
2	2	7	6
3	3	14	13
4	4	35	32
5	5	17	16
6	6	12	11
7	<b>(7 Strongly Agree)</b>	18	17
<b>Total</b>		<b>109</b>	<b>100%</b>

#### **Q7. Analysis**

These findings reveal the largest group of respondents (32 percent) answered neutral to the statement presented in Q7. Additionally, 17 percent of respondents “Strongly Agree” that NASA’s media relations have an influence on the way Congress votes on NASA related issues. Conversely, only 6 percent of respondents answered “Strongly Disagree” to the statement presented in Q7. Overall, a cumulative (44 percent) agree with the statement while a cumulative (25 percent) disagreed with the statement posed in Q7.

**Q8. Based on your knowledge of the NASA programs listed below, how would you rate NASA's handling of its media relations efforts?**

	<i>Excellent</i>	<i>Above Average</i>	<i>Average</i>	<i>Below Average</i>	<i>Poor</i>	<i>Cannot evaluate properly</i>	<i>Total</i>
Mercury program (First Astronauts)	31 29%	26 24%	16 15%	4 4%	0 0%	30 28%	107
Apollo program (Apollo 11)	49 46%	20 19%	18 17%	4 4%	0 0%	16 15%	107
Space Shuttle program	27 25%	31 29%	30 28%	7 7%	6 6%	6 6%	107
International Space Station program	21 20%	19 18%	35 33%	14 13%	10 9%	8 7%	107
NASA Aeronautics R&D	7 7%	14 13%	25 23%	23 21%	20 19%	18 17%	107
<b>Total</b>	<b>135</b>	<b>110</b>	<b>124</b>	<b>52</b>	<b>36</b>	<b>78</b>	<b>535</b>

#### **Q8. Analysis**

Apollo 11 rated the highest of all NASA programs with 46 percent of respondents rating NASA's media relations excellent during this era. This finding could be a result of Apollo's historic significance. NASA's media relations efforts during the Mercury program rated second in the excellent column with 29 percent. However, 28 percent of respondents answered "Cannot evaluate properly" in the Mercury program row. Conversely, NASA's media relations related to its R&D program rated the highest in the poor column. Although these results cannot be extrapolated to the greater population it is

clear that respondents had a poor perception of NASA's media relations toward its Research and Development program.

**Q9. Based on your knowledge of the following specific NASA events, how would you rate NASA's handling of its media relations efforts?**

	<i>Excellent</i>	<i>Above Average</i>	<i>Average</i>	<i>Below Average</i>	<i>Poor</i>	<i>Cannot Evaluate Properly</i>	<i>Total</i>
Announcement of the Mercury 7 (First Astronauts)	34 32%	26 24%	10 9%	2 2%	2 2%	33 31%	107
Pres. Kennedy's historic Apollo speech	41 38%	21 20%	19 18%	4 4%	1 1%	21 20%	107
Neil Armstrong's Moonwalk	62 58%	15 14%	12 11%	2 2%	1 1%	15 14%	107
Apollo -Soyuz "Historic Handshake"	21 20%	24 22%	25 23%	10 9%	2 2%	25 23%	107
Space Shuttle Columbia disaster	29 27%	31 29%	28 26%	7 7%	3 3%	9 8%	107
Space Shuttle Challenger disaster	23 21%	31 29%	29 27%	6 6%	5 5%	13 12%	107
The ending of the Space Shuttle program	17 16%	26 24%	33 31%	12 11%	13 12%	6 6%	107
<b>Total</b>	<b>227</b>	<b>174</b>	<b>156</b>	<b>43</b>	<b>27</b>	<b>122</b>	<b>749</b>

### **Q9. Analysis**

Neil Armstrong's moonwalk rated the highest of all the NASA events listed. The second highest rated NASA activity was President Kennedy's speech announcing that America would place a man on the moon by the end of the decade. These findings reveal the respondent's perception of NASA's media relations during the Apollo era was at its highest. However, several respondents were unable to properly evaluate NASA's media relations during other important eras. For example, 31 percent of respondents answered unable to determine when asked about NASA's media relations efforts during the announcement of America's first astronauts. This lack of evaluative capability could be a result of the generational identity of the respondent pool.

### **Q10. Are you aware of NASA's social media presence?**

<i><b>Order</b></i>	<i><b>Answer</b></i>	<i><b>Frequency</b></i>	<i><b>Percent</b></i>
<b>1</b>	<b>Yes</b>	<b>80</b>	<b>75</b>
<b>2</b>	<b>No</b>	<b>27</b>	<b>25</b>
	<b>Total</b>	<b>107</b>	<b>100%</b>

### **Q10. Analysis**

These findings reveal 8 of 10 respondents said they were aware on NASA's social media presence. This data reveals that an overwhelming majority of respondents are aware of NASA's social media presence. These findings are consistent with findings in previous questions that reveal a majority of respondents use digital media to follow NASA activities.

**Q10a. If you answered yes, briefly describe your views on NASA’s effectiveness in using social media.**

*(Open ended question)*

<i><b>Order</b></i>	<i><b>Answer</b></i>	<i><b>Responses</b></i>	<i><b>Percent</b></i>
<b>1</b>		<b>66</b>	<b>100</b>

#### **Q10a. Analysis**

Q10a probes respondents on their views of NASA’s effectiveness in using social media. Since Q10a is an open-ended question the responses varied. The author performed a content analysis of the responses to this question to properly interpret the responses. The author separated the responses according to positive and negative tones. Overall, the majority of the responses to this question were positive. These results were not a surprise since many members of the respondent pool either work for NASA or follow NASA activities via NASA’s social media websites.

**Q10b. I choose not to answer this open-ended question.**

	<i>Answer</i>	<i>Responses</i>	<i>Percent</i>
<b>1</b>	<b>Yes</b>	<b>39</b>	<b>100</b>
	<b>Total</b>	<b>39</b>	<b>100%</b>

**Q10b. Analysis**

To avoid flaws in the research instrument, the author added an extra question to the Q10 set. This question allowed respondents who did not wish to answer the open-ended question to still complete the survey. These findings reveal 39 respondents decided to skip this open-ended question.



**Q11. Please rate the effectiveness of each communication vehicle in general.**

	<i>Effective</i>	<i>Not Effective</i>	<i>Unable to determine</i>	<i>Total</i>
<b>Newspapers</b>	62 58%	27 25%	17 16%	106
<b>TV</b>	76 72%	15 14%	15 14%	106
<b>Radio</b>	48 45%	32 30%	26 25%	106
<b>Science magazines</b>	82 77%	14 13%	10 9%	106
<b>Facebook</b>	62 58%	20 19%	24 23%	106
<b>Twitter</b>	62 58%	16 15%	28 26%	106
<b>YouTube</b>	74 70%	12 11%	20 19%	106
<b>Podcast</b>	38 36%	25 24%	43 41%	106
<b>Space related websites</b>	87 82%	7 7%	12 11%	106
<b>Total</b>	591	168	195	954

**Q11. Analysis**

Space related websites were rated the most effective of all the media channels listed with 82 percent of respondents rating it effective. Conversely, podcasts were rated the most ineffective of all the media channels listed with 36 percent of respondents rating it effective. Interestingly, podcasts also rated the highest in the “unable to determine” category. This means 4 of 10 respondents do not use podcasts related to NASA often enough to accurately rate its effectiveness.

**Q12. Please rate the effectiveness of NASA’s use of the following communication channels in its media relations efforts.**

	<i>Effective</i>	<i>Not Effective</i>	<i>Unable to determine</i>	<i>Total</i>
Newspapers	48 46%	31 30%	26 25%	105
TV	57 54%	32 30%	16 15%	105
Radio	25 24%	36 34%	44 42%	105
Science magazines	70 67%	16 15%	19 18%	105
Facebook	50 48%	21 20%	34 32%	105
Twitter	53 50%	17 16%	35 33%	105
YouTube	59 56%	15 14%	31 30%	105
Podcast	26 25%	24 23%	55 52%	105
Space related websites	74 70%	14 13%	17 16%	105
<b>Total</b>	<b>462</b>	<b>206</b>	<b>277</b>	<b>945</b>

### **Q12. Analysis**

Q12 asks respondents to rate the effectiveness of NASA’s use of a variety of media channels. Therefore, the author developed a matrix for this question so each channel could be rated independently. Once again, space related websites had the highest rating of all media channels with 70 percent of respondents rating the channel effective.

The second highest rated channel in the effective column was science magazines with 67 percent of respondents rating the channel effective. Third place went to YouTube

with 56 percent of respondents rating the channel effective. Overall, online media channels rated higher than the broadcast media channels.

**Q13. In the space provided please provide any thoughts you may have concerning NASA's media relations efforts.**

*(Open ended question)*

<i>Order</i>	<i>Answer</i>	<i>Responses</i>	<i>Percent</i>
<b>1</b>		<b>53</b>	<b>100</b>

### **Q13. Analysis**

Q13 probed respondents on their feelings toward NASA's media relations efforts. As stated on previous question analyses, this question was open-ended and produced a plethora of responses. Overall, the majority of respondents provided positive responses. However, some respondents mentioned that NASA should do a better job at attracting attention outside of the space community.

**Q13a. I choose not to answer this open-ended question.**

<i>Order</i>	<i>Answer</i>	<i>Responses</i>	<i>Percent</i>
<b>1</b>	<b>Yes</b>	<b>52</b>	<b>100</b>
	<b>Total</b>	<b>52</b>	<b>100%</b>

**Q13a. Analysis**

These findings reveal 52 respondents decided not to answer Q13a. When compared to the number of respondents who choose this option on Q10a, it can be concluded that a large amount of respondents were willing to take other parts of the survey but did not want to respond to open-ended questions. This finding could be due to the online format the survey was distributed to respondents.

**Q14. In the space provided please provide your thoughts about NASA's use of social media as a communication tool.**

*(Open ended question)*

<b>Order</b>	<b>Answer</b>	<b>Responses</b>	<b>Percent</b>
<b>1</b>		<b>49</b>	<b>100</b>

#### **Q14. Analysis**

Nearly 5 of 10 respondents answered the last question set of the survey. As with previous questions, the open-ended format provided a wide-range of responses. These responses were categorized and analyzed according to the criteria of positive and negative. Overall, the majority of respondents were very positive toward NASA's use of social media.

#### **Q14a. I choose not to answer this open-ended question.**

<b>Order</b>	<b>Answer</b>	<b>Responses</b>	<b>Percent</b>
<b>1</b>	<b>Yes</b>	<b>56</b>	<b>100</b>
<b>Total</b>		<b>56</b>	<b>100%</b>

#### **Q14a. Analysis**

These findings reveal 5 of 10 respondents chose not to answer this open-ended question. As stated previously, it can be concluded that a large amount of respondents were willing to take other parts of the survey but did not want to respond to open-ended questions.

## **Methodology 2: Interviews**

### **Interview questions for key NASA staff and administrators**

The author conducted six interviews with key personnel at NASA to collect qualitative data related to the thesis topic. The author will discuss the responses to each interview question and provide an objective analysis of the various responses.

### **Interview Questions and Analysis**

#### **1. How would you describe the impact of NASA's increased reliance on social media as a communication tool from its previous focus on traditional media relations?**

Overall, respondents expressed positive outlooks related to NASA's media relations efforts. As employees and administrators at NASA, their inside knowledge of NASA's daily media relations efforts allowed them to answer this question accurately. For example, Stephanie Schierholz, former NASA social media manager, described NASA's current use of social media as an enhancement to their use of traditional media.

#### **2. Please describe the ways that NASA public information officers use Twitter.**

Responses to this question were consistent. All respondents described NASA's use of Twitter as various and extensive. Overall, NASA public information officers use NASA to disseminate its news releases and communicate with the millions of followers. NASA has over 100 Twitter accounts for numerous research centers, satellites and departments. According to Rob Gutro, NASA deputy news chief, each NASA mission now has a Twitter account.

**3. Please describe the ways that NASA public information officers use Facebook.**

According to the respondents interviewed, NASA's use of Facebook is constant. NASA posts photos, videos and information on Facebook to communicate internally and externally. NASA's global audience requires it to maintain an accessible and open channel. Dwayne C. Brown, senior public affairs officer, stated Facebook allows NASA to communicate with scientist all over the world instantaneously. Additionally, Brown stated that social media platforms like Facebook allow him to disseminate information very quickly in a crisis situation and supersede barriers like language and time zone differences more effectively than traditional communication.

**4. In general, how would you describe the effectiveness of NASA's use of social media in general as a tool in its media relations efforts?**

Overall, respondents described NASA's use of social media as effective and efficient. According to Dwayne C. Brown, NASA may soon discontinue its practicing of distributing its news release in print and rely solely on social media for content dissemination. Additionally, Brown stated that an overwhelming majority of NASA's intermediary audience (media) use social media to receive news about NASA activities.

**5. Does NASA still use traditional news releases in its media relations efforts? If yes, how would you describe the effectiveness of news releases in achieving the organization's media relations goals?**

Respondents stated that NASA still uses traditional methods of content dissemination. Rob Gutro stated that NASA deals with a global media. Respondents stated that news releases are very important to NASA's daily contact with various media outlets. Debbie Rivera explained that NASA's media relations efforts in all forms contribute to its transparency with legislators and the public.

**6. Briefly share your thoughts of the effectiveness of social media as opposed to traditional media in NASA's media relations efforts today.**

Overall, respondents rated NASA's use of social media and traditional media effective. Although NASA uses social media websites like Twitter, Facebook and YouTube, it also produces its own content on its NASATV and 3<sup>rd</sup> Rock Radio platforms. These broadcast media channels allow NASA to control its own message and communicate directly with several target audiences. Yvonne Clearwater felt NASA media relations in all forms were very effective. She explained that each channel targets a specific audience.

**7. When NASA has a major announcement, what is the procedure to disseminate the information to the public?**

According to respondents, NASA has several methods of disseminating information to the public. NASA uses news releases, press conferences, live streams, and countless other methods to release information. In fact, Stephanie Schierholz stated NASA has a mandate to maintain transparency with the public. This mandate mainly



involves informing the public of its daily activities and discoveries through various media channels.

**8. Has NASA incorporated the use of social media into its crisis communication plans? If yes, how has it done so?**

Several respondents explained NASA has various crisis communication plans that include several steps including using social media to release information and accommodate media requests. According to the respondents interviewed, NASA uses social media to communicate all of its news to its target audience. Therefore, it uses social media as part of that process.

**9. Do you feel Twitter enhances NASA's ability to communicate with target audiences, and if so why?**

Each respondent felt Twitter greatly enhances NASA's ability to communicate with its target audiences. As mentioned earlier, NASA has over 100 Twitter accounts. Therefore, NASA's extensive use of the social media website serves as testament to NASA's perception of the channel. Overall, each respondent held Twitter's capacity to assist NASA in communicating with various audiences as beneficial. Rob Gutro felt followers of NASA on social media websites ability to re-tweet NASA activities to their individual groups of followers helped NASA's media relations capabilities grow exponentially.

**10. What impact has social media had on NASA's media relations strategies?**

Each respondent expressed their support for the world's transition to social media. Additionally, Dwayne C. Brown mentioned that NASA is considered the gold standard of government agencies using social media. Social media platforms have enhanced the

capability of an organization that requires constant contact with thousands of individuals. Rob Gutro said, “Social media is now part of every strategy.” Additionally, respondents felt social media has made an enormous impact on NASA’s media relations. For example, Stephanie Scheirholz said, “Journalists tell me all the time they strictly use Twitter or Facebook to get all their NASA news.”

#### **11. Please share your thoughts concerning NASA’s future media relations efforts.**

Debbie Rivera was very hopeful about the future of NASA media relations. Specifically, NASA’s key position on the International Space Station will present new opportunities for NASA public information officers to disseminate information to and from space. Additionally, NASA can collaborate with scientist from all over the world performing experiments on the International Space Station via social media. According to Steven Garber, NASA has been sending broadcasts and content to the public from space since NASA’s early years.

#### **12. In general, what information does NASA provide to media members?**

According to respondents, NASA provides media members with a plethora of materials. These materials include press kits, news releases, B-roll footage, video, audio, photos, and more. Additionally, NASA employees are accessible to members of the media reporting via traditional and social media channels. Dwayne C. Brown said, “NASA grants media access to print media, broadcast media, social media, and internet journalists.” For example, new media journalists are treated with an increased respect because many newspapers have downsized. Therefore, many traditional media journalists now use social media and the internet to report on NASA activities.

**13. Briefly describe your thoughts on the effectiveness of NASA's handling of the ending of the space shuttle program?**

NASA employees felt NASA handled the media relations efforts surrounding the end of the space shuttle program effectively. However, some respondents did acknowledge the public's frustration with NASA for ending the program without a new vehicle to take its place. Overall, Yvonne Clearwater felt NASA handled the situation with class and professionalism.

**14. What feedback have you received from members of the media about your decision to use Twitter for releases?**

Several respondents felt media members have provided positive feedback regarding NASA's use of Twitter. Debbie Rivera felt Twitter provides opportunities to disseminate information globally in new and exciting ways. Additionally, Stephanie Schierholz mentioned NASA's use of Foursquare, YouTube, Facebook and its website as major social media platforms of communication for NASA in addition to Twitter. Overall, a majority of respondents felt Twitter enhances NASA's internal and external communication.

**15. What is the biggest obstacle in getting your messages to the proper audiences through traditional channels like television news?**

Respondents felt broadcast media gatekeepers like news editors were their biggest obstacle. According to Rob Gutro, gatekeepers of traditional media have to prioritize and filter all the news releases they receive on a daily basis. Therefore, NASA public information officers have to attract attention to their messages and compete with other

news related to America's involvement in war, crime stories and breaking news.

Additionally, most broadcast media channels attract a wide audience.

These audiences may not react to NASA's science discoveries or activities.

Overall, NASA's activities generally attract a specific niche audience. Activities other than a shuttle launch rarely receive the attention NASA would like them too.

### **Delphi Study: Methodology 3**

The author created and executed a Delphi Study. As discussed in chapter 3, the focus of this methodology was the opinion of PRSA fellows related the elements of social media campaigns and regaining credibility with members of the media after a poor media relations effort. The respondent pool for this study consisted of nine prominent members of the communications field and fellows at the Public Relations Society of America. Of the nine fellows that started the study, six completed the study. The following paragraphs will describe the findings revealed.

#### **Delphi Study – Round 1**

##### **Q1. What three elements should be included in a social media campaign?**

###### **Analysis**

Responses to this question in varied. Some Fellows listed tactical elements like photos and some Fellows listed theoretical elements like accountability, and strategic planning. However, the most frequently appearing responses focused on theoretical elements.

##### **Q2. What three elements should not be included in a social media campaign?**

###### **Analysis**

Responses to this question were more consistent than Q1. Overall, Fellows listed unethical principles and messages as elements that shouldn't be included in a social media campaign. The responses to this question were the converse of the responses in Q1. For example, responses to Q1 were mostly related to ethical theoretical principles; however, responses to Q2 consisted of unethical principles or messages.

**Q3. How do you regain credibility with the media after a poor media relations effort?**

**Analysis**

The responses to this question ranged from tactical to theoretical. However, most Fellows responded in a similar fashion. Overall, responses to this question focused on accountability and relational capital. Fellows offered expert opinions from personal and professional experience.

**Round 2- Consensus**

Fellows were asked to form a consensus around the most popular answer for each question. The criteria for selection as “most popular answer” involved performing a content analysis of responses for each question. Additionally, responses were evaluated according to the categories of theoretical or tactical. Once these responses were evaluated they were filtered and entered into a final category called mass sentiment. Finally, the responses that paraphrased the tone of all responses were identified as most popular answer. The most popular answers were distributed to the same group of Fellows in the same manner as round one.

**Q1. What three elements should be included in a social media campaign?**

**Most popular response:** authenticity, transparency and honesty.

Fellows were asked to choose between two options in the response set to this question “I Agree” or “I do not agree”. The responses were unanimous in the “I Agree” column. This finding reveals that the Fellows comprising this group came to a consensus related to this question.

**Q2. What three elements should not be included in a social media campaign?**

**Most popular response:** non-researched messages, audiences and channels.

Fellows were asked to choose between two options in the response set to this question “I Agree” or “I do not agree”. Once again, the responses were unanimous in the “I Agree” column. This finding reveals that the Fellows comprising this group came to a consensus related to this question.

**Q3. How would you regain credibility with the media after a poor media relations effort?**

**Most popular response:** Be honest and explain/apologize for the mistake.

Fellows were asked to choose between two options in the response set to this question “I Agree” or “I do not agree”. Just as with the first two questions the responses were unanimous in the “I Agree” column. This finding reveals that the Fellows comprising this group came to a consensus related to this question.

Overall, the responses in round two support the communications principles upheld by NASA media relations employees. Fellows responded in a unanimous fashion to the most popular responses provided in round two. These findings could be the result of years of experience or the high ethical standards PRSA Fellows personify.

However, more research should be done on this issue to reveal if the unanimous responses were the result of a causal or correlative relationship. As stated previously, round two concluded the Delphi Study due to the similarity in responses and small group of respondents.

## **Chapter 5**

### **Final Analysis**

#### **Summary**

After conducting a comparative analysis of NASA media relations strategies, the author discovered that NASA provides members of the media with a plethora of channels to receive its messages. The data revealed NASA perceives itself as the leader among all other government agencies in disseminating information through social media and its website instead of traditional media channels. Additionally, this thesis provided data that suggests the respondent pool followed NASA activities online far more frequently than they followed its activities through print media.

The tone of statements by NASA media relations personnel during the interviews suggested NASA may eventually phase out its print media news releases and rely solely on digital media platforms to disseminate its messages. This finding could be significant because this information derived directly from senior public information officers and individuals directly involved with NASA media relations on a daily basis. Therefore, findings revealed during the one-on-one interviews can be extrapolated to the greater NASA population since the individuals conducting the interviews directly affect the policy of the organization. Additionally, these individuals are tasked with the responsibility to speak on behalf of the organization's media relations department on a daily basis.

As stated throughout this thesis, NASA has used the media for decades to communicate with the public in a professional manner. However, the survey findings revealed some feelings of frustration from respondents due to a lack of accessibility to NASA spokespersons and information during past crisis situations at NASA. Overall, the findings revealed respondents had



a positive perception of NASA's media relations efforts. It is the opinion of the author that the space race of the 1950's captured the attention of the world and rallied American and Russian citizens respectively around each nation's quest for supremacy in space. From the early days of spaceflight until today both nations use media relations strategies to inform the public of its space exploration activities.

## **Conclusion**

In conclusion, the author feels the research findings suggest each of the author's three hypotheses were correct. However, the low numbers of respondents in the sample selected revealed that future research should be done to fully research this thesis topic.

For example, the first hypothesis states that a majority of respondents would have a favorable view of NASA's media relations efforts. The findings revealed that a majority of respondents had favorable views of NASA's media relations efforts. However, more research needs to be done on a larger sample to reveal more comprehensive data related to this issue.

The second hypothesis predicted that a majority of PRSA Fellows would tout ethical principles as a major component of a social media campaign. The findings from the Delphi Study revealed that ethical principles were the most frequently occurring response during round one among a majority of PRSA Fellows. However, future researchers should continue this study with a larger group of PRSA Fellows over a longer period of time to reveal a true consensus among experts in the field of media relations.

The author's third and final hypothesis related to respondent's positive perception of NASA's online media relations. The findings did reveal a majority of respondents said they preferred NASA's online media relations efforts to its print media relations efforts.

Interestingly, NASA employees stated they are receiving similar feedback from the space journalist community and its social media consumers that mirrors the findings in the study. The survey findings reflected the trends revealed during one-on-one interviews. NASA employees independently validated the findings related to this hypothesis. These interviews were conducted before the survey data was collected. As stated in chapter four, NASA employees had no knowledge of the survey results. Therefore, the author can definitively state that this hypothesis was correct. However, future research should be done to discover ways large organizations like NASA can create media relations strategies that keep pace with the rate of technological advances like smartphones, mobile internet and tablets.

### **Recommendations for future research**

The research findings suggest that respondents followed NASA's activities daily using digital channels like the internet and social media. Therefore, more research must be done to truly assess NASA's use of each channel.

For example, a national study should be conducted that examines this topic according to demographics like age, geographic location and occupation. These demographical categories will allow a researcher to evaluate the responses according to more specific cross-tabulation.

Additionally, the relationship between NASA media relations strategies and U.S. space policy requires further study. Although many respondents agreed with the statement presented in Q7 of the survey relating to NASA media relations and the voting habits of Congress the majority of respondent's answers fell in the neutral category of the semantic differential. Therefore, future research should be done that includes members of Congress to provide a balanced perspective on this issue.

It is the opinion of the author that future researchers should do separate studies of each group included in the sample and compare the results over time.

The perceptions of individuals who work with NASA in different capacities requires comprehensive study. Therefore, the author feels to scientifically assess the efficacy of NASA's media relations strategies a large scale study over a period of at least two years should be attempted by future researchers.

It is the opinion of the author that this topic will become increasingly relevant as technology changes the way organizations communicate internally and externally. The introduction of social media has already changed the landscape of communication for individuals, small businesses and large organizations. Therefore, media relations in the 21<sup>st</sup> century and beyond may look drastically different than what it looked like a century before.

With the advances in satellite technology and a permanent laboratory on the international space station, the public could soon be watching full broadcasts from the Moon, Mars or another point in the solar system just as easily as we watch CNN broadcast from remote countries around the world today. The research revealed during this thesis lead the author to believe that whatever advances in technology take place in the future, they are likely to be accompanied by advances in the way humans communicate.

This symbiotic relationship between man, machine and policy needs to be comprehensively researched from new perspectives such as the author did in this thesis to fully understand how this relationship works and how it may change in the future. For example, a planet of roughly seven billion people all connected at the touch of a button or a voice command, or someday even a stream of thought will enhance our ability to communicate like never before; however, it also will require new policies. The author feels scientific organizations such as

NASA must maintain a constant communication stream with the non-scientific community to ensure that the public understands how the research conducted at NASA benefits their everyday lives.

This relationship will allow the support of the masses for benefits of space science to be leveraged against the powers of policymakers who decide on budgets and regulations that sometimes conflict with what's safely possible in space. With commercial space travel becoming an emerging industry just as the commercial aviation industry was almost a century ago, the possibilities could be endless and we should all sit back and enjoy the ride.

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