

Some Results from Dittmar Associates' Market Study of the Space Exploration Program

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Maintaining the Space Exploration program over 30-40 years will require the public to willingly enable its Congressional representatives to consistently allocate some percentage of their tax money to send humans to the Moon and to Mars. If that is the goal, then what does the public want in return? Dittmar Associates sought to uncover some of the answers to this question by conducting a market study in late summer and early fall of 2004. Over 1000 people living in the United States were interviewed and asked to respond to questions pertaining to NASA and the space program. In general, the findings of this study supported the earlier results of a July, 2004 Gallup Poll that found widespread support for NASA. In addition, information about underlying motivations, thoughts and concerns about the space program as reported by study respondents revealed significant differences among certain groups with regard to the level of, and reasons for, attitudes toward various components of the Vision for Space Exploration. Some results of the study are discussed, together with implications of the findings for the short and long-term sustainability of the Space Exploration effort.

I. Introduction

THE Vision for Space Exploration (VSE) proposed by President Bush in January 2004 calls for humans to return to the Moon, establish a presence there, and use the capabilities developed on the lunar surface as a stepping-off point for further exploration of the Solar System with Mars as the initial destination. Specific milestones include the launch of robotic missions to the lunar surface by 2008, human arrival on the Moon between 2015 and 2020, and the execution of a human Mars mission sometime thereafter.

In July of 2004, the Gallup Organization conducted a poll on America's Space Program that was coordinated by the Space Foundation and sponsored by the Coalition for Space Exploration, a national advocacy group made up of aerospace contractors and others who support space exploration. The results revealed that a majority of Americans support space flight and the new program, and that they believe space exploration has generated benefits impacting their daily lives. The Gallup Poll reported that Americans were somewhat more divided on the issue of funding for NASA.¹

The impetus for the present study was generated from two sources: (1) The results of the Gallup Poll, which revealed general support for the space program but some uncertainty regarding implementation, suggesting that Americans have thoughts and feelings about the program that might be of interest to explore further, and (2) NASA's call in April of 2004 for papers that specifically addressed the issue of sustainability.² This question was later taken up by the President's Commission on the Implementation of United States Space Exploration Policy – later known as the Aldridge Commission after its Chair, Edward C. "Pete" Aldridge – which was chartered by NASA in part to address outreach and sustainability. Acknowledging that sustaining such an ambitious program over 30-40 years and multiple Presidential Administrations and sessions of Congress was very challenging, the commission heard from individuals in academia, business, entertainment, the arts, and interested members of the public, searching for ways to maintain the program over time.

In a sense, some of the problems inherent in sustaining a government program over several decades are the same problems faced by companies seeking to establish a brand name and product line that will survive the ebb and flow of public interest over time. Companies that build brand recognition for the long run do so in part by making careful use of marketing techniques that keep corporate understanding of public perceptions and desires up-to-date. These techniques include test marketing of products and, of course, surveys. Their purpose is to identify present and potential customers and develop a clear understanding of their thoughts, feelings, wants and needs that may later

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provide the basis for developing advertising and generating sales. The final goal of all marketing activity is to generate a behavior; specifically, the initiation by the customer of an act of exchanging money for products (goods and/or services).

On one level, the problem faced by NASA in sustaining the Space Exploration program can be viewed as a “marketing challenge” of significant proportions.³ In point of fact, the agency, and more broadly the U.S. Government, is asking the public to willingly enable its Congressional representatives to consistently allocate some percentage of their tax money to send humans to the Moon and Mars. If that is the goal, then what does the public want in return? This question is of interest not only to NASA, but to large aerospace corporations, small businesses developing technologies that might be of benefit to the space program, the U.S. Government as a whole, civil space advocacy groups, commercial space companies and advocates, politicians, and members of the public itself. How relevant is NASA and the plan for Space Exploration to the day-to-day lives of Americans? What are the motivations, concerns, uncertainties, disappointments, and hopes resident in the Nation for its Space Program?

Dittmar Associates sought to answer some of these questions by conducting a study in the late summer and early fall of 2004. Combining attributes of a survey and an interview, a questionnaire was developed, tested and deployed over a 3 month period. Over 1000 people living in the United States were interviewed and asked to respond to 30 questions pertaining to NASA and the Space Program. Some of the questions asked for simple “yes-no” answers, some asked respondents to rank their perceptions, and others invited the participants to offer their own ideas, thoughts, and suggestions *as if they could be heard by NASA*. The study thus serves as a type of poll, but more importantly as a dialogue – one-sided though it may be – between a representative sample of the American public and its space agency.

The hoped-for outcome of the study was that it will provide findings of value the development of the Space Exploration initiative, with particular regard to the following:

- 1) Policy formulation and planning
- 2) Establishment of program requirements
- 3) Planning and implementation of a 40-year advocacy program
- 4) Clarification of some political issues, and
- 5) Assessment of the “domestic market” for Space Exploration; i.e., the American public sector

II. Method

What follows is a brief overview of the survey method and discussion of some of the choices made in developing and administering the survey.

A. The Questionnaire

The chief interest of Dittmar Associates was to explore some variables that might impact American attitudes toward the VSE, with particular attention to those aspects of the program that occur in the “out years”, beyond the planned completion of the International Space Station assembly missions in 2010. As a result, many of the research questions in the first part of the survey focused on robotic and human missions to the Moon and to Mars. Mention of the plans to return the Space Shuttle to flight, to develop the Crew Exploration Vehicle, and to complete the Space Station was placed in the latter portion of the survey to enable respondents to think about Moon and Mars missions without concern as to how these were linked to the Shuttle and Space Station programs. Near the end of the survey, the components of the VSE were presented “in the whole” to survey respondents in order to ask further questions about the entire 30-40 year program, from “end-to-end.”[†]

Solicitation of underlying public perceptions toward the Space Program was achieved by the use of interview questions. Typically, individuals were first presented with a “rating-type” question on a topic. Examples include questions wherein participants were asked to rate the degree of their agreement with a statement, to rate their support for the program, or to rate relevance of the program, etc. In some cases, a follow-up question was presented, in which respondents were asked to provide additional information to the interviewer regarding their previous answer.

[†] In structuring the study in this way, we introduced the possibility of order effects; that is, contamination or unintended manipulation of the attitudes (and therefore the responses) of participants to questions about the nearer-term aspects of the VSE, based upon their earlier responses. A discussion of the impact of possible order effects and the steps taken to evaluate them in the study is presented in the Appendix.

These questions were intended to engage participants in a dialogue by inviting them to “tell us more” about their opinions. At times, additional clarification was sought when the initial answer was unclear as to meaning.

B. The Sample

The questionnaire was administered to a sample of 1,029 Americans contacted by phone using a method whereby phone numbers were randomly generated within area codes. Those questions consisting of “yes/no” or rating responses have an estimated error rate of $\pm 3\%$ for aggregate responses – that is, when the entire sample is used. Further stratification of responses was developed and analyzed. When presented in the paper by demographic variable (for example, “gender”), the average error rate was approximately $\pm 5\%$.

Development and pilot testing of the questionnaire took place during August, 2004. The final version of the questionnaire was deployed in early September and the survey completed by mid-October. Data analysis proceeded throughout the remainder of October and was completed during the first week of November. The final, 71-page report was published in mid-November by Dittmar Associates.⁴

C. Demographic Variables

The demographic variables selected for analysis in this study are listed here, together with their associated ranges. With only a few exceptions, the ranges and definitions of the variables are identical to those used by the U.S. Census Bureau.[‡]

- 1) Gender (male/female)
- 2) Age (18 or older)
- 3) Level of education (9th grade through doctorate or terminal degree)
- 4) Occupation type (mgmt./professional, service, sales and office, agriculture, construction, government (including military), retired, unemployed, other)
- 5) Income (0 to over \$300,000/yr.)
- 6) Region of the country (Northeast, South, Midwest, West)
- 7) Political party affiliation (Democrat, Republican, Independent)
- 8) Ethnic background (African American, Asian, White, Latino/Hispanic, Native American, other)
- 9) Dependents (yes/no)
- 10) Marital status (married, separated, single, divorced, widow/widower, other).

D. Analysis

All answers were recorded verbatim at the time they were answered. In the case of forced-choice (“yes/no”) or rating (1-5 scale) questions, non-parametric statistical methods were used to compare the response frequencies within and between demographic groups.⁵ With regard to the interview questions; the data were reduced and then categorized by independent judges. After further statistical analysis to validate the categorization process, all responses were mapped back into the final categories and the percentage of responses in each category was tallied. All categories used to describe the responses of participants to interview-style questions were determined by this method. The result is a rich data set, which will continue to be analyzed for future studies.

III. Results

Owing to space constraints, only a small portion of the entire results set will be presented here. In general, only aggregate results will be discussed.

A. American Support for Space Exploration Remains Strong

Perhaps the clearest result of this study is that it confirms the July 2004 Gallup Poll results describing ongoing public awareness and engagement with the idea of human space flight. Figure 1 presents the results of a question that solicited

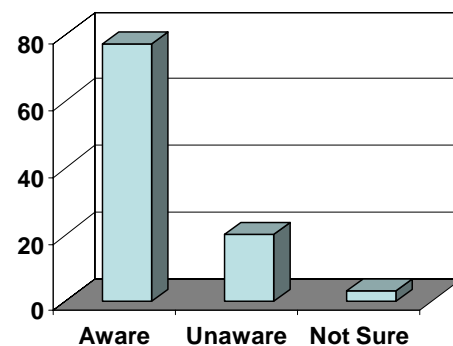


Figure 1. Percentage of Americans who indicated they were aware, unaware, or not sure of the existence of the Vision for Space Exploration

[‡] Accessible at <http://www.census.gov/popest/estimates.php>

information regarding whether or not respondents were aware of the Vision for Space Exploration, with 77% of the sample indicating that they were aware of the VSE, 20% indicating that there were not aware, and 3% who were not sure.

In addition, support for the Space Exploration program remains strong, with 69% of Americans endorsing the plan, and 26% opposed. These results closely mirror those reported by the Gallup Organization, which reported 68% supporting and 24% opposed, respectively. These results are presented in Figure 2. As is often the case, however, aggregate results may mask significant differences among demographic groups. With regard to awareness and support of the VSE, one such group difference was found with respect to gender. Men indicated both a greater awareness of and stronger support for the VSE than did women. Among ethnic groups, the positive relationship between awareness and support was repeated. A similar finding was also found with regard to age of the respondents.

B. Support for the VSE Varies as a Function of Time and Mission

1. Near-term vs. Far-term Vision

As previously indicated, components of the Vision for Space Exploration were presented separately, as individual programs or missions, and then as a whole representing the entire scope of the VSE. Although time (“near-term vs. “far term”) was not called out as a variable in any of the survey questions, interest and excitement among the respondents varied as a function of whether the particular mission or set of missions under discussion was closer in time or further away. Specifically, Shuttle Return to Flight and completion of the International Space Station (ISS) were viewed positively and return to the Moon only slightly less positively; however a human mission to Mars was not generally endorsed.

2. A Question of Risk

As indicated, respondents were asked to provide additional information regarding the reasons for their answers throughout the study. With regard to specific components of the VSE, reasons provided for supporting nearer-term missions focused largely on the continuing benefits of the space program. Return to the Moon is understood by 48% percent of respondents as continuing a mission undertaken decades earlier; repeating and extending the space program in order to learn to live on other planets, while 43% indicated that they were not certain why return is planned. (Despite the majority support for return to the Moon, note that these categorical responses explaining why or why not support is present differ by only a slight margin.) In the cases of Return to Flight of the Shuttle and returning to the Moon, risk is mentioned as a concern but is not related to the results.

A human mission to Mars, however, evoked a broad range of negative responses. While 61% of Americans reported interest and excitement regarding the successes of the Mars rover missions of 2004, it appeared that these feelings did not translate into endorsement of a human Mars mission. A majority of respondents expressed a lack of clarity regarding the purpose and benefits of such a mission. Concurrently, a majority of respondents cited risk to human life as an issue of enough concern to create opposition to the endeavor. While 65% of participants responded positively to the missions described in the VSE up through return to the Moon, only 18% of Americans support the plan to send humans to Mars.

C. The Perception of Relevance and NASA Funding

Previous polls have also asked questions about support/opposition to the space program. In order to provide additional information, Dittmar Associates sought to explore other thoughts and feelings that might lie beneath expressions of support or opposition. We began by asking a question about relevance in an attempt to get at the meaning assigned to NASA and the space program with regard to respondent’s personal lives. A majority of individuals described NASA as relevant or very relevant, rather than irrelevant or very irrelevant (52% to 35%). Careful interpretation of these data reveals that although the majority of people in this study indicated that NASA is relevant to them, more than one-third of respondents responded that it is irrelevant, with another 13% expressing neutrality. Taken together, 52% of the respondents indicated that NASA is relevant, while 48% found it irrelevant or had no opinion on the matter. Regardless of how people responded to the question regarding relevance, however,

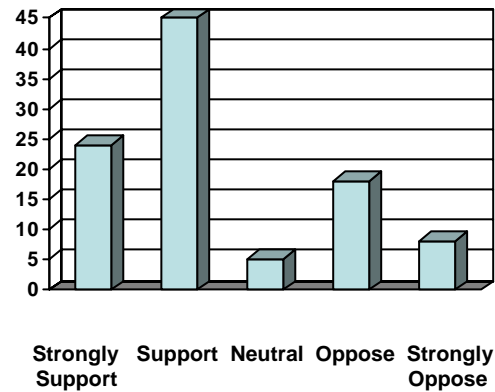


Figure 2. Percentage of Americans expressing support, neutrality, or opposition to the Vision for Space Exploration

the majority of respondents indicated that they were aware of and appreciated the technical and social benefits of the space program. This result was one of the most pervasive findings in the survey.

Americans are worried about terrorism, about the U.S. economy, and about funding for programs such as defense, healthcare, and education. When asked about funding, it was these concerns that influenced many of those who supported leaving NASA funding at or below its current level of funding. This finding is consistent with previous surveys. However, the degree to which Americans rated NASA as relevant was even more strongly related to their support for NASA funding, in a logical direction: Those Americans who believe NASA programs are relevant to their day-to-day lives were much more likely to support increased NASA funding than those who do not. This finding may have direct implications for marketing the VSE; i.e., improving the perceived relevance of the agency's work may improve willingness to support increased funding.

Most Americans have no idea what percentage of federal funding is accorded to NASA (or any other federal agency) each year. Responses to a question about funding were manipulated in the study by first asking respondents about cost and then about whether they thought NASA funding should remain the same, decrease, or increase. The first time the question was asked without reference to the actual budget allocations, participants "voted" for maintaining, decreasing or increasing the NASA budget in very similar percentages: 35% felt it should be retained at current levels, 30% felt it should be increased, and 35% felt it should be decreased. Later, respondents were presented with the percentage of the federal budget represented by NASA's current budget request, described as "less than 1% - approximately seven-tenths of 1% - of the federal budget", and asked again about funding levels. A shift occurred, with 42% now supporting an increase, 29% suggesting it remain at current levels, and 29% supporting a decrease in funding. These results not only illustrate the well-known sensitivity of individuals to the phrasing of research questions, but also suggest that some segments of the American public might support an increase in NASA's funding relative to the rest of the U.S. budget.

As with other questions regarding support of the space program and endorsement for various components of the VSE, there were significant differences in attitudes toward funding on the basis of gender, ethnic groups, age, and other demographic variables. While these differences invite closer examination, it is beyond the scope of this paper to do so. Additional information may be found in the complete report of The Market Study for Space Exploration.⁶

D. Selling the Vision

During discussions with respondents regarding relevance, several persons volunteered the perception that NASA frequently suffered from "bad publicity". These individuals anticipated a later question concerning public perception of how well public relations or "marketing" of NASA is executed. Participants indicated that they believed NASA was marketed poorly or very poorly by more than 4 to 1. In addition, respondents believed that much more could be done to promote NASA and the space program, with suggestions ranging from the use of internet and computer gaming activities to attract and engage young people, to town meetings, to the development of a sustained public relations campaign.

IV. Conclusions

A. Personalization

Several conclusions may be drawn from The Market Study for Space Exploration. The first pertains to the desire for engagement with NASA, and with the Vision for Space Exploration. Although support and interest remain strong, respondents also expressed discomfort with NASA that, surprisingly, seems to stem less from the challenges the agency has faced in its recent history and more from the perception that although the public supports the space program, the space program is disengaged from and uncaring about the public. The desire for a responsive NASA – one that goes out of its way to involve interested citizenry in real and meaningful ways beyond traditional "outreach and education" – emerged repeatedly in responses to questions asking about relevance of the space program to their everyday lives. When asked "What could NASA do to make the space program more relevant to you, personally?" the suggestions and comments offered by participants ranged from creative and innovative to the wildly impractical. However, it was the personalization of NASA that stood out.[§] Subsequent to completing their review and categorization of the comments made about relevance, more than one independent judge involved in the study made the observation that the personalization of NASA impressed them. By "personalization" we mean the desire apparently experienced by many respondents in our study that the American space agency should interact with its

[§] One of the more poignant of these comments was offered by an 18 year old male: "Why don't they put people our age into videos and show us what kinds of things we could do with NASA if we're not straight A students? I can't build robots and stuff but I like to play video games and maybe I could help somehow because I'm not stupid."⁷

public so as to make of it a true partner in NASA's missions, in particular with regard to Space Exploration. This desire may offer a unique opportunity for NASA and for the larger community supporting Space Exploration to engage Americans more actively as advocates for NASA's new mission.

B. Messages

Public relations efforts take time to craft and, even when well-researched, are frequently a "hit and miss" proposition – try something, see if it works, and try something else. However, it is clear that some messages about the VSE are not "coming through" at the same time that people are asking to hear them. Those messages that have come through successfully often involve specific, easily understood examples. One instance is the oft-cited relationship between NASA technology development and the personal computer. Respondents who mentioned this were aware that the linkage between NASA and the PC is not a straight, direct line, but they know that NASA work contributed to the development of this increasingly ubiquitous machine. Messages that make use of highly specific products, programs, outreach activities, etc., and that are publicized by individuals with high recognition quality (targeted to demographic group) are more likely to reach the public than are messages constructed and presented otherwise. In addition, expanded use of the internet and the gaming industry appear to have high potential for engaging a growing segment of the population.

As a part of the VSE program, NASA is soliciting innovative approaches and entities that have not previously been involved in the space program, including large and small businesses outside the traditional aerospace sector.** Businesses interested in leveraging technologies or materials developed with NASA for the VSE into the commercial sector have a stake in the larger market. Many respondents made comments about commercialization, branding, and product development. Companies that can position themselves knowledgeably with regard to these efforts may find significant benefits in understanding those market segments who are engaged or disengaged with the idea of space – and may come up with ways to reach out to groups that are relatively disinterested at the present time.

C. Sustaining the Vision: Implementing a 30-40 Year Public Relations Campaign

Americans as a whole continue to support the space program, NASA, and now the Vision for Space Exploration, although this support wanes as the plan moves into the future and simply is not present for the portion of the Vision that proposes to send humans to Mars. In spite of this support, however, there are significant differences among demographic groups that bear closer examination and may be of concern to advocates of the Vision, as they are likely to have significant impact upon public and political discourse. In general, the results of the survey suggest that there may be value in developing a public relations or "outreach" campaign that is structured with clear characterization of market segments and targeting of activities, education, media, and other methods designed to engage and persuade. Input from the public, as recorded and analyzed here and presented in complete form in The Market Study for Space Exploration report may prove helpful in this regard.⁸

It is worth noting that, throughout the survey, the majority of respondents were able to verbalize one or more benefits of the space program, whether or not they supported the VSE. The ability to do so, however, did not appear to be a primary determinant in the position taken by each individual vis-à-vis the space program. Instead, it appears that awareness of the benefits of the space program is related to the extent to which participants believe NASA is relevant to their daily lives - and it is relevance that is a strong predictor of support. Although the need for and absence of a story that "ties it all together" was mentioned by only 4 respondents, it does seem from these results that a technical argument for the VSE which relies only on the benefits of one technology or another may not be sufficient to make the case in either the public or political forum, although it is a good place to start. Rather, the development of an approach that leverages public appreciation for those benefits in the context of a long-lasting, integrating theme or narrative that is highly relevant to people within or across demographic groups may be an approach worthy of effort. Further, demographically-distinct messages and themes that appeal to values and issues associated with various groups should be considered in addition to a sweeping narrative.

Finally, the development of an orchestrated, systematic public relations campaign designed to remain in place for 30-40 years will require ongoing data development, the introduction of new ideas and media as mass communications and preferences change, and above all the fortitude to overcome the occasional failure that will surely come. Crafting such campaign will require resources, collaboration, and creativity, but achieving this goal would contribute in large part to successfully meeting the "challenge of sustainability" inherent to the Vision for Space Exploration.

**NASA. Accessed at http://www.nasa.gov/missions/solarsystem/explore_main.html

Appendix: Technical Issues

Various methods can be used to manage sampling or response bias should it be inadvertently introduced into a population survey or poll. One of the most common of these is a “Form A/Form B” design in which two forms of the poll are given, one to each half of the sample. Order of the questions is arranged so as to “cancel out” any unintended effects. In order to evaluate the possibility of order effects associated with presentation of various components of the VSE, a “Form B” of the questionnaire was presented to a sample of 150 people. These individuals were first presented with questions pertaining to the Shuttle and Space Station, whereas “Form A” placed questions regarding the later components of the VSE first. A comparison between Form A and Form B responses revealed no differences, although the sample size for this comparison was quite small. Dittmar Associates chose to proceed with the original format of the questionnaire.

It should be kept in mind that all sample surveys are prone to sampling error. The degree of error depends upon the size of the sample and also on the construction and presentation of the survey. Finally, it is important to bear in mind that, in addition to sampling error, error in survey results can be introduced by inadvertent bias in question or survey instrument construction, or by the interview process itself. In the case of this market study, every effort was made to minimize all types of error through development, testing, modification, standardization of deployment, sampling methodology, and careful analysis of the survey and results.

Acknowledgments

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