

Preface

The conquest of outer space is in suspension, whether temporarily or permanently we cannot be sure. Great accomplishments of the past were the Apollo missions to the Moon, 1968–1972, and the first space probes to the planets, Mariner 2 to Venus in 1962 and Mariner 4 to Mars in 1964. Even the marvelous Hubble Space Telescope dates from more than two decades ago, 1990 to be exact. Human activity continues in near Earth orbit, although its value is open to debate, and astronomy continues to progress through use of space probes and space telescopes. While we cannot predict the future in space, and it seems quite problematic at the present time, research on the values of spaceflight for human beings can inform the important decisions that must be made, and illuminate the position of humans in the universe. This book draws upon a huge corpus of American public opinion data, and similar social science information, to explore the multiple meanings that exploration beyond the boundaries of our world may have.

The first chapter introduces the main methodologies and theories that must be employed to extract valid meaning from questionnaire data, using a few specific polls as illustrations. Two very different questionnaire methods must be combined: (1) administration of a few simple questions to random samples of the general population, to extrapolate with some confidence the balance of opinions in the society as a whole and (2) administration of much more complex questionnaires to specialized populations, placing the methodological emphasis on statistical analysis of how ideas fit together, using formal theory and empirical replication as validity checks. Two specific social-scientific theories are introduced that will feature throughout the book: (1) the standard observation that some individuals serve as opinion leaders, shaping the beliefs and attitudes of the general public and (2) technological determinism that analyzes any particular kind of technology in the context of the more general status of science and engineering of the particular historical period.

The next three chapters survey the development of public opinion using three different kinds of questionnaire study: (1) ordinary episodic public opinion polls like Gallup and Harris, (2) the General Social Survey (GSS) that systematically polled the US public for four decades, and (3) a specialized study of students at

Harvard University that explored their opinions about spaceflight more deeply than the two other approaches could afford to attempt. Chapter 2 focuses on the great Space Race between the United States and the Soviet Union, roughly in the decade and a half during 1957–1972, which is the period in which public opinion polls for the first time asked many questions about spaceflight, and popular awareness consolidated. Chapter 3 considers the period 1972–2012, using data from the GSS to see how support for space program funding correlated with support for other government programs and with variables describing respondents' age, social class, occupation, education, and political ideology. Chapter 4 employs data collected by the author at Harvard University in 1986, in the wake of the Challenger space shuttle disaster, through a pair of questionnaires that asked about a very large number of possible meanings spaceflight might have, employing the factor analysis statistical technique to identify underlying values, and determining how each affects overall support for space program funding.

The next two chapters employ the full range of kinds of questionnaire studies to place spaceflight in the context of world events and scientific progress. Chapter 5 returns to general public opinion polls to examine the meaning of events that took place after Apollo, especially policy decisions about the Strategic Defense Initiative and the recovery from the Challenger disaster, or might take place sometime in the future, notably the possible human return to the Moon and expeditions to Mars. Chapter 6 considers how spaceflight relates to various perspectives on science, beginning with a poll of scientists carried out in 1964 that found them rather unenthusiastic about the space program. This observation leads to the question of how science should be defined, whether as technical studies intended to provide information engineers can use to develop new technologies, or as philosophical explorations of the nature of reality as it really is, not as humans might wish it to be. Among the aspects of American culture that shape public perceptions of science, quite apart from factual news about space accomplishments are religion and pseudoscience, which do appear to militate against realistic appraisal, at least for significant minorities of citizens.

Three chapters then use questionnaires and comparable research techniques that have been developed recently to explore the popular culture of spaceflight, called *science fiction* or *sci-fi*. Chapter 7 examines the emergence of spaceflight fiction late in the nineteenth century, the launch of the first science fiction magazine in 1926 that established the genre, and the complex multidimensional set of genres that had consolidated half a century later, each with its own distinctive appraisal of spaceflight. Chapter 8 examines two more popular media, movies and television, given that cinema began depicting spaceflight as early as 1902, and a very significant number of films and programs continued to do so, especially after about 1950, using recommender system data on recent movie preferences to identify multiple mass media conceptions of interplanetary travel. Chapter 9 considers the newest mass medium that depicts spaceflight, computer games, especially massively multiplayer online (MMO) virtual worlds, in which users experience simulated spaceflight, including questionnaire-like data from two of these MMOs that suggest the human goals that the respondents seek beyond the boundaries of the Earth.

The concluding chapter looks back at all the findings of earlier chapters in the context of general explanatory theories. Its starting point is the frontier metaphor repeatedly associated with space exploration, especially in the light of the theory of what happens when a frontier closes, enunciated over a century ago by American historian Frederick Jackson Turner. A larger context can be provided by several theories, primarily European in origin, about the fall of civilizations, that would consider the end of space exploration to have dire consequences for humanity. The chapter then considers how the spaceflight social movement competes with other cultural traditions within western societies, giving some attention to the links between spaceflight support and gender, and with education analyzed by gender. Some questionnaire data suggest that the worldwide explosion in popular use of the Internet may be creating a new world culture that is more favorably disposed toward space exploration. Technological determinist theories suggest that spaceflight may experience a second acceleration phase, so long as popular interest has some degree of strength, once other fields of technology advance to the point at which new means of interplanetary travel become possible.



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Public Perceptions

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