THE SCIENTIFIC CONSTRUCTION OF PUBLICS: MARS ONE, REALITY TV, AND DEMOCRATIC RHETORIC

Jonathan Scott Brennen

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Approved by:

Daniel Kreiss

Tom Linden

Andy Andrews

ABSTRACT

JONATHAN BRENNEN: The Scientific Construction of Publics: Mars One, Reality TV, and
Democratic Rhetoric
(Under the direction of Daniel Kreiss)

This case study considers how Mars One, the Dutch start-up company working to

use reality television to fund the first human colony on Mars, draws on democratic

rhetoric in communicating with the public. It demonstrates how Mars One adopts the

rhetoric of what Jeffrey Alexander calls the democratic "civil sphere" in order to

construct publics from which it can gain legitimacy, financial support, and cultural

capital. Based on these findings, I argue for consolidating and expanding the public

engagement turn in science and technology studies literature by initiating a new research

program around the "scientific construction of publics" (SCOP). Such a program would

look to the ways that scientists create, convene and mobilize publics through technical,

media, and rhetorical practice. A SCOP program opens space for richer and more

contextualized accounts of science-public interactions by emphasizing the role of rhetoric

in the *strategic* construction of publics. In doing so, this program would be attuned to the

more general commercialization of science, recognizing the ways in which this and other

macro contexts compel scientific organizations to innovate new means and strategies of

accumulating resources.

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INTRODUCTION

Journalists have called Mars One "Big Brother in Space," (Zap, 2012),

"Snooki in Space," (Clark, 2013), and a televised "suicide mission" (Brandon,

2012). While journalists struggle to make sense of it, Mars One is pursuing its

plan to use reality television to fund the first human colony on Mars. In an

interview with the popular science, technology, and science fiction blog Io9.com,

Bas Lansdorp, the founder and General Director of Mars One, claimed that

through this plan, "millions can experience Mars through the eyes and ears of the

astronauts on Mars, because of the reality TV. The reality TV makes it a mission

of all humans on Earth" (Io9.com, 2012). Despite this democratic rhetoric, in an

interview with the BBC two months earlier, Lansdorp admitted, "reality TV is an

added component just to make it [the mission] possible" (Holligan, 2012).

Lansdorp's depiction of reality television as a tool for democracy on one

hand and for fundraising on the other points to the difficulty in characterizing

Mars One. How are we to make sense of an organization that is pursuing the

expansion of humanity into space through reality television? Like Lansdorp, other

Mars One personnel frequently use democratic rhetoric, referring to the project's

"open" approach (Shukor, 2013), its "global audience participation" (Roach,

2013), or just its "democratic process" (MO website: Astronaut Selection). Just as

it is a puzzle how to make sense of an organization trying to do space science and

exploration through reality television, there is also the question of why Mars One

personnel consistently invoke democracy. In using this rhetoric, Mars One personnel set themselves apart from governmental space agencies, suggesting a more basic question: what is the relationship between the commercialization of the space sector and the proliferation of democratic rhetoric?

Recently, a number of scholars have argued that science and technology studies (STS) has entered an "age of engagement" (Delgado et al., 2011). Scholars have been considering (e.g. Jensen & Buckley, 2012), categorizing (e.g. Rowe & Frewer, 2005), and calling for various forms of public engagement (PE) in both science and scientific decision-making (e.g. Irwin, 1995) to better motivate "citizens' active involvement in the development of socio-technical trajectories" (Delgado et al., 2011: 827). In much of this literature PE is an "umbrella term" (Jensen & Buckley, 2012) consisting of modes of "public communication, public consultation, and public participation" (Rowe & Frewer, 2005).

In some ways Mars One seems as though it could be a poster-child for this PE scholarship: an ambitious scientific organization designed from the start around engaging the public. As a commercial organization, Mars One must proceed without the resources and legitimacy of governmental space organizations. To do so, Mars One is going directly to the public. As it works to gain legitimacy, money, and support, Mars One relies less on "expert" or technical discourse, and more on democratic rhetoric. That being said, when Mars One first announced itself to the world on May 31, 2012, it had no supporters, no financial contributors, and no existing television audience. To say, therefore, that Mars One is using participatory rhetoric to gain resources directly from the public is to miss an important step. First, Mars One had to *construct* specific publics that

could support the project. This is to say that Mars One had to fashion a community around itself, from which it could draw the cultural and financial resources it needs.

When Lansdorp describes Mars One as a "mission of all humans on Earth" (Io9.com, 2012), he hints at something important about Mars One's use of democratic rhetoric. In particular, Mars One seems to be stepping into and drawing from what Jeffrey Alexander refers to as the civil sphere. As described by Alexander, the civil sphere is the cultural space of democracy. It is "more than legally guaranteed rights, private associations, and voluntary groups. It is also a structure of feeling…" (Alexander, 2010: 9). In particular, it is anchored in the discourse of the democratic ideals of "liberty, equality, and community" (Alexander, 2010: 2). However, for Alexander all social action is performative, leaving the civil sphere a space in which actors must perform democratic discourse as rhetoric. It is this civil sphere discourse that Mars One seems to be adopting and performing as it works to construct publics of support.

While a number of scholars have been looking at the ways that scientific public engagement activities construct specific publics (Irwin, 2001; Lezaun & Soneryd, 2007; Michael, 2009; Braun & Schultz, 2010; Felt & Fochler, 2010), this work offers limited purchase on Mars One. What this literature fails to address, and what this case study highlights, is the *strategic* construction of publics. What is needed is a perspective that better recognizes the assorted means by which scientific actors strategically attempt to construct publics for specific ends. In particular, as Mars One demonstrates, rhetoric must be recognized to serve a significant role in the construction of publics, a point that existing

literature has failed to explore in depth.

In light of the findings of this case study and the limitations of existing literature, in this article I argue that there is a need for a new research program around what I call the "scientific construction of publics" (SCOP). Such a program would look to the ways scientists create, convene, and mobilize publics through technical, media, and rhetorical practice. A SCOP program opens space for richer and more contextualized accounts of science-public interactions by emphasizing rhetoric and the *strategic* construction of publics. This program is especially timely given current changes in the practice and funding of science. A SCOP program would also be attuned to the increasing commercialization of science (Mirowski & Sent, 2008), recognizing the ways in which this and other social, political, or economic contexts compel scientific organizations to innovate new means and strategies of accumulating resources.

Mars One offers a strong case for exploring public engagement with scientific organizations. On a theoretical level, Mars One is a new company that both formally and informally involves various publics in the project. By basing its business model on securing or constructing a large and involved audience, it formalizes its reliance on publics for support. Also, as a new organization, working to take over space exploration from governmental space programs, Mars One must legitimate itself as both capable and worthy of pursuing space exploration on behalf of humanity.

Empirically, Mars One offers a visible and extreme case of the commercialization of the space sector. Increasingly, for-profit and not-for-profit organizations are planning and pursuing activities in space. However, there have been few empirical studies of these

emerging organizations. Similarly, both the private space sector, and the space sector more generally have not received extensive attention from STS or PE scholars. Recent PE scholarship appears to be more concerned with government (e.g. Felt & Fochler, 2010) or large-scale commercial organizations (e.g. Goven, 2006). Far less work considers small, start-up scientific organizations. Because of this, Mars One offers both a fascinating and worthwhile empirical site.

In the sections below, I draw on both recent PE literature and Alexander's body of work on the civil sphere to analyze Mars One's use of democratic rhetoric and show how this case reveals a need for research on the scientific construction of publics. First, I briefly review these two literatures. Then, I explain my two-part methodology: an interpretative analysis of a broad corpus of materials produced by and about Mars One, and a small set of semi-structured interviews with Mars One affiliates. Next, I provide a short background of Mars One, locating it within the more general commercialization of the space sector. Then, I analyze the ways that Mars One draws on the language and symbols of the civil sphere as it attempts to construct specific publics from which it can gather and secure legitimacy, money, and support. One of the key ways Mars One does so is by using governmental space agencies as foils, against which it can position itself positively within binary oppositions. Next, I draw on the findings of this case to argue for a more general research program around the scientific construction of publics through rhetoric and new media practice. Finally, I explore what analytical and empirical insights a SCOP research program could potentially provide to our understanding of interactions between scientific organizations and

publics.

LITERATURE REVIEW

Public Engagement

Much of the literature around PE builds on a specific line of STS-influenced public understanding of science (PuS) work that has developed over the past twenty years and has been called the critical (ex. Michael, 2001), constructivist (Wynne, 1995), ethnographic (Irwin & Michael, 2003), or contextual (Miller, 2001) turn. Though this work is extensive and varied, much of it recognizes that "people experience science socially, not in abstract, purely cognitive form" (Wynne, 1992: 42). This recognition helps to prioritize the "highly relevant knowledge and skills" of "lay local publics" (Michael, 2001: 208) in scientific and technical research and decision-making. Some of this work has looked at "the *cultural dis-utility* of scientific knowledge—whether experts undermine, or attempt to colonise, lay local knowledge and culture" (Michael, 2001: 208, emphasis in original). In doing so, much of this literature complicates popular if simplistic notions about the interactions between scientist and publics that draw on the idea of "scientific sufficiency and public deficiency" (Gross, 1994: 6).

Within the PE literature, some have recently been considering "the constructive dimensions of public participation exercises" (Braun & Schultz, 2010: 404), the ways in which opportunities for public involvement in scientific research and decision-making create publics. Scholars have looked at the ways that PE activities create specific "subjects of participation" (ibid. 414), "scientific citizens" (Irwin, 2001) or publics (Lezaun & Soneryd, 2007; Michael, 2009). Felt & Fochler, calling for a more holistic

account, advocate considering both how PE activities and the rhetoric around them construct subject positions, as well as "how participants actually inhabit and appropriate these discursive spaces 'offered' to them" (Felt & Fochler, 2010: 220).

Some recent scholars have offered a critique of normative PE scholarship, noting that PE activities and the rhetoric around them "can inadvertently become an agent of tacit rationalisation of deep structures of power which science as institutionalised co-constructs and naturalises." (Wynne, 2007: 106). Irwin notes the way that "transparency and openness are presented as a means of convincing skeptical members of the public to trust decision-making processes" (Irwin, 2006: 306). In this sense, these scholars have made a reflexive turn, critiquing PE exercises and rhetoric for maintaining the very same exclusionary or unequal expert-lay interactions. In this way, "dialogue and participation may also be read as just another way of educating and pacifying unruly publics resistant to top-down information" (Felt & Fochler, 2010: 221). In essence, these critiques offer a reading in which entrenched power interests strategically mobilize PE opportunities and rhetoric. Specifically, such rhetoric becomes implicated in the mobilization of consent of lay publics in the continuation of the status quo.

These two lines of the PE literature suggest a growing interest in looking at the relationships between science and publics in new ways. What is missing in the current literature is a more holistic account that combines a focus on the ways that public engagement activities construct publics, with an interest in the strategic mobilization of publics for specific resources. Such a literature would combine an interest in the construction of publics with a recognition of the strategic dimension of communicative action. Similarly, though critiques of PE have endowed participatory rhetoric with the

ability to facilitate hegemonic accommodation, accounts focused on the construction of publics have focused more on participation exercises. In this sense, current literature is lacking a more detailed account of the role that rhetoric plays in the strategic construction and mobilization of publics. Finally, existing literature has not gone far enough contextualizing the construction of publics. Much of this literature has failed to locate organizations strategically working to construct publics within larger social, political, or economic contexts. For example, while there has been much STS attention to the commercialization of scientific research (e.g. Mirowski & Sent, 2008) little work has located the construction of publics within this specific context. Similarly, this literature has failed to situate and contextualize specific modes of public participation and participatory rhetoric. Specific modes of public engagement have histories and origins that should be acknowledged and interrogated.

Mars One opens the case for investigating and locating one space entrepreneur's strategic use of democratic rhetoric to construct and mobilize publics. In the case study below, I consider how, within the increasing commercialization of the space sector, Mars One is forced to engage with publics in order to gain resources it cannot otherwise access. In doing so, it draws on the particular democratic language of what Jeffrey Alexander calls the civil sphere. Alexander's work provides useful insight into the cultural structures that inform Mars One's democratic rhetoric, while elucidating the roles that this rhetoric plays in science-public interactions and dynamics. In order to better understand the civil sphere and how Mars One is strategically positioning itself within it, I look to Jeffrey Alexander's recent body of work.

Alexander and the Civil Sphere

In his book *The Performance of Politics* (2010), Jeffrey Alexander provides useful insight into the workings of the civil sphere. In this book, Alexander extends his previous work articulating a "cultural pragmatics" (ex. Alexander & Smith, 1993) to the 2008 presidential election. Alexander's theory of cultural pragmatics resolves all social action as performances. In bringing cultural pragmatics to politics, Alexander is especially interested in how politicians successfully gain political power. He notes, "in order to gain power in a democratic society, one must win the formal consent of one's fellow citizens. It is these members of the democratic public— what I call the 'civil sphere'—who call the shots" (Alexander, 2010: 7). Alexander argues that within the civil sphere, politicians gain political power by making "felicitous" performances that "re-fuse speaker and audience, to connect with the members of civil society" (2010: 287). Alexander ascribes the civil sphere a significant cultural dimension. In his cultural pragmatics more generally, Alexander takes as foundational "the relative autonomy of structures of meaning," (2011: 11). In this way, he creates a strong analytical distinction between structures of meaning and the way they are performed. These structured meanings help to endow the civil sphere with both a particular language and a specific logic or set of rules. Politicians create performances by drawing on scripts from the cultural background. Felicitous performances depend on successfully performing "the codes and narratives" (2010: 287) of the civil sphere. This allows Alexander to assert, "to understand modern politics, one must interpret and explain the structured meanings upon which political speech and action draw" (2010: 282). More generally, this allows Alexander to emphasize the role of meaning and rhetoric in the civil sphere.

Alexander ascribes the civil sphere a particular set of cultural structures. First, the civil sphere is defined and held together by "the continuing vitality of democratic discourse and the robustness of solidarity….The civil sphere is a form of social and cultural organization rooted simultaneously in a radical individualism and a thoroughgoing collectivism" (2010: 278). In particular, Alexander notes, "the ideals of liberty, equality, and community are buried in the heart and soul of American society" (2010: 2). These three ideals help to define the participatory rhetoric that infuses the civil sphere.

If Alexander argues for a greater attention to meaning in the civil sphere, in his semiotics-influenced structural perspective, "meaning is difference, and political legitimacy must be understood in exactly this way" (2010: 89). This provides Alexander the imperative to give special attention to binaries, noting quite simply, "the discourse of civil society is divided into either/or binaries" (2010: 10). This is to say that binaries provide a basic logic to the discourse of the civil sphere. He then extends the focus on binaries into his account of politics, "success in a campaign depends on making the civil sphere's binary language walk and talk. Live human beings must seem to embody the hopeful discourse of liberty, all the while pushing the dark and brooding qualities that mark the discourse of repression to the other side" (2010: 11). More generally, in order to make a "felicitous" performance, a politician must be seen as "embodying the discourse of civil society" (2010: 18), that is, "one must become a collective representation—a symbolic vessel filled with what citizens hold most dear" (ibid.). Not only must one make binaries "walk and talk," one must also successfully mobilize structured meanings or collective representations to do so.

If meaning is structured as binaries, the "good guys" are often cast as "heroes." Indeed, "political stories are all about heroes" (2010: 63), and to be successful, politicians must successfully argue that they are heroes. Alexander notes commonalities in civil-sphere discourse around heroes. Heroes are "perched on the very hinge of history" (2010: 68), facing "unprecedented dangers and opportunities" and worse, challenges to the continuation of a "triumphant, mythical history" (2010: 67). Against this, "characters become heroes by overcoming great odds and by resolving what seem to be overwhelming challenges" (ibid).

Alexander's account outlines the cultural structures that provide the civil sphere with a specific language and set of symbols. As shown below, Mars One draws on the language and symbols of the civil sphere in order to strategically construct and mobilize publics. In order to better explain the ways in which Mars One does so, I will first provide some background on Mars One, while briefly locating it within the more general commercialization of the space sector.

The Case

The commercial sector has played some role in space science and exploration and from the beginning (Freedman, 2010). However, within the past 20 years, a number of non-government organizations have created and pursued business plans in space independent of any national governments. Industry, government, and the public have broadly supported the increased role of non-government organizations in the space sector (e.g. Levine, 1986; Pelton, 2010; Lambert, 2010). Some believe that for-profit companies will be able to pursue work in space cheaper and more efficiently than governmental space agencies (Pelton, 2010). Others believe that by outsourcing routine tasks, like delivering payloads to the international space station, NASA will be more free to pursue "its central purpose, space *exploration*" (Lambert, 2010: 152, emphasis in original).

The commercialization of space is being pursued in several distinct ways. A number of companies, including Virgin Galactic and Boeing, are building businesses around space tourism, in which customers pay for suborbital flights in space (Timberlake, 2009: 83). Other companies are creating and initiating business plans based around mining asteroids or other planets, zero-g manufacturing, and suborbital transportation and shipping (Freedman, 2010).

Mars One is a Dutch not-for-profit organization working to found a permanent human colony on Mars by 2023. The initial four colonists, joined every two years by four more, will not plan on returning to Earth, instead they will most likely remain permanently on Mars. Mars One's plan holds that all the technology necessary for the

project already exists and can be supplied by current businesses. In this way, Mars One claims that it is "not an aerospace company" (MO website: The Technology). Instead it considers itself an "apolitical integrator" (MO website: Roadmap) that serves only to bring existing businesses, experts, and technologies together. Mars One plans to pay for the project, which it estimates at costing $6 billion, "by involving the whole world as the audience of an interactive, televised broadcast of every aspect of this mission, from the astronaut selections and their preparations to the arrival on Mars and their lives on the Red Planet" (MO Website: About MO).

     As a company, Mars One is composed of seven core staff members: two aerospace engineers, one graphic artist, one medical doctor, a director of finance, and two communication officers. Mars One has also consolidated a board of 16 "advisors," "industry and scientific experts who bring real-world experience to Mars One" (MO website: Advisors). MO also has gathered a group of six "ambassadors," well-known professionals including a Nobel-prize winning physicist and the first Malaysian astronaut, who will "spread the good news about Mars One, supporting the ambitious endeavor it has undertaken" (MO website: Ambassadors).

METHODS

In order to better understand the ways that Mars One uses democratic rhetoric, I performed an interpretive analysis of a range of texts produced by and about Mars One. I collected all the materials I could find produced between May 31, 2012, when Mars One first announced itself to the world, and March 1, 2013. The materials I analyze include: nine press releases; 33 "announcements;" seven "Newsmails" (monthly news letters both sent to readers and archived by Mars One); five official videos; two videos of TED talks; the entire Mars One website, both as accessed in late February 2013 and as archived at other times; the official Mars One FAQ; five exchanges on interactive websites: including two open exchanges with the community on Reddit.com and Q&As from Slashdot.com, io9.com, and MarsOneFans.com; MO's Facebook, Google+, and LinkedIn pages, tracked since May, 31, 2012; and, all of its 221 tweets. I also gathered every print, magazine, and Internet news article that I could find using LexisNexis, assorted commercial search engines, and Mars One's own archive of news publicity. However, for the analysis I only included those written in English, resulting in 74 articles from June 2012 through February 2013. I also collected assorted materials by and about Mars One's sponsors, investors and business partners, including websites, promotional materials, and news articles.

I also conducted a set of semi-structured interviews with people associated with Mars One. I used direct interview requests and snowball sampling to secure informants. I

conducted phone or Skype interviews with the following MO advisors: John Rummel, Brian Enke, Pascale Ehrenfreund, John Traphagan, and Jamie Guined. I also conducted an interview with Jeff Moe, the CEO and founder of Aleph Objects, one of Mars One's first business sponsors. Additionally, I conducted one online interview with Brian Krassenstein, co-founder of MarsOneFans.com through the text chat function on Skype, and an email interview with MO advisor Christopher McKay. Within interviews I considered informants to be speaking on behalf on Mars One, and I read their responses as rhetorical texts in much the same way that I read "official" Mars One communication.

FINDINGS

As its staff members frequently state, Mars One has no formal connections to any governmental organizations. Though Mars One's staff claims this confers an advantage to the project, it also means that Mars One is cut off from the support and legitimacy that come with government cooperation. Instead, Mars One must draw resources from other sources, including the general public. That being said, there is no "the public," no ready-formed group of Mars One supporters simply waiting to be mobilized. In order to accumulate resources, Mars One must first differentiate and construct publics that can provide support.

In the following sections I look at the ways that Mars One adopts the language and symbols of the civil sphere, centering its discourse on three ideals of democracy: liberty, equality, and community. It does so at the expense of more "expert" or "technical" discourse, and works to construct and mobilize publics to gain resources. Additionally, I consider how Mars One's rhetoric invokes the binaries described by Alexander, helping it become certain collective representations. Unlike political actors in the civil sphere, Mars One is not working towards securing political power and formal political office. Instead, Mars One's staff is more interested in constructing publics from which it can secure legitimacy, money, and cultural capital. However, by drawing on the

language of the civil sphere, Mars One personnel seem to be pushing Mars One, and indeed the space sector more generally, to assume a more "civil" character.

Liberty

In its website FAQ, Mars One asks: "Why did Columbus travel west? Why did Marco Polo head east? Because it is that pull, that unknown, that prospect of adventure that compels humans to seek new frontiers to explore" (FAQ: Why go to Mars?). Exploration itself is seen as a liberty, a basic human right and desire. As such, one ambassador notes, "This project seems to me to be the only way to fulfill dreams of mankind's expansion into space" ('t Hooft, 2013). If exploration is a basic human liberty, Mars One offers itself as "the only way" to reclaim and protect it. This is to say that space exploration is a liberty that has been lost by space programs run by unmotivated and inefficient governments. But it is a liberty that Mars One, the heroic space entrepreneur with an innovative approach, can help to preserve.

Interestingly, it is within Mars One's unique approach and business model that the organization locates a second form of liberty as the freedom of efficiency. One press release referred to Mars One as "a non-political integrator capable of delivering humans to Mars with less overhead, less total risk, and faster than any other existing organization" (MO press release, 8.29.12). In this way, Mars One is unencumbered by what it casts as restricting bureaucracy and red tape. One staffer claims, "we should not wait for politicians to decide if we want to go to Mars, we should look at ourselves and see what we can do to make it possible" (MO

website: Marieke Wagensveld). Mars One offers the opportunity to embrace the liberty to follow the "basic human desire" of exploration free from the restrictions of overgrown bureaucracies and governmental organizations. Not only is Mars One caste as a heroic protector of the essential liberty of exploration, but also it becomes the heroic protector of the liberty of efficiency. Just like heroic politicians protecting us from "a world-historical crisis [that] domestically and internationally threatens to derail the nation's triumphant, mythical history" (Alexander, 2010: 67), Mars One offers itself as saving us from clear threats to liberties of exploration and efficiency, brought on bloated and stolid government programs.

According to the rhetoric of its staffers, Mars One has adopted an entrepreneurial identity that seeks to protect the liberties of exploration and efficiency. MO argues that its market orientation can achieve this in two separate ways. First, as entrepreneurs, Mars One's staff can "work with the best suppliers the world has to offer independent of their geographic location or national affiliation," (MO website: Is this really possible?) who are "enthused to work with an apolitical integrator whose intent is to conduct a manned mission to Mars" (MO website: Roadmap). Mars One's plan hinges on convening existing businesses, bringing together "the best suppliers" throughout the world in a way government never could. Against significant challenges, Mars One suggests that it will use its capacity to draw together the best the world offers, to protect our liberty to explore. But just as heroes must overcome great challenges, they face "great odds" (Alexander, 2010: 67) and must take great risks. Mars One's staff

similarly "will take risks, they want to push the envelope. They want to go farther quicker than anyone has gone before, and they're willing to take that risk. Whereas at NASA, everything is so calculated and you have to go through so many steps in the process"(Guined, 2013). But what ultimately separates Mars One from other agencies, what allows and compels it to take risks, is its connection to the free market. Bas Lansdorp, MO's general director, describes himself as "a born entrepreneur, he sees potential and opportunity where others shy away" (MO website: Bas Lansdorp). Entrepreneurs have the vision and the willingness to take risks that others lack. And those qualities grant Mars One's staff the ability to heroically protect these basic human liberties.

Equality

After Mars One formally became a non-profit organization, an official announcement claimed that, "any person in the world can now contribute to the development of placing the first humans on Mars" (MO announcement, 12.5.12). Similarly, thanks to reality television, "everyone will get the chance to not only watch the astronauts make their journey, but choose who gets to do so." (MO FAQ: Is this for real?). That is to say, just as everyone is equally able to contribute money to the project, through reality television, everyone in the world will equally watch, share, and help shape the project. Indeed, reality television is imagined as an even more potent equalizer. In an interview, Bas Lansdorp, MO's general director argues:

"This is a mission that should be lived by all people of the Earth. Unfortunately, only four people will get to go per two years, but millions of other would do anything to be in their place. Now, these millions can experience Mars through

the eyes and ears of the astronauts on Mars, because of the reality TV. The reality TV makes it a mission of all humans on Earth" (Io9.com, 2012).

In this way, reality television will not only provide the audience with equal opportunity to engage with the project, according to Lansdorp, it will equalize audience and astronauts. Yet, this will not erase the fact that only a small number of astronauts will actually go to Mars. In light of this, Mars One claims that it will offer a unique approach. "The Mars One approach to establishing a human settlement on Mars is unique in that it is not a closed system, rather it is open to everyone in the world" (Shukor, 2013). By this, Shukor, the first Malaysian astronaut and Mars One ambassador, means, "unique to all other space exploration endeavors before it, Mars One is opening the astronaut program to anyone on planet Earth that meets the base criteria" (MO press release: 1.8.13).

If everyone is equally able to contribute to, watch, and apply to join the project, Mars One's staff also gain a massive base of support. On one hand, noting that everyone *can* contribute equally to the project clearly becomes the argument that everyone in the world *should* share both the success and (financial) burden of the project. If MO is equally everyone's project, it becomes equally everyone's responsibility to fund and support it. In this way, MO personnel also seem to be distributing or crowd-sourcing the legitimacy of the project. MO becomes legitimate because it belongs to the whole world.

Similarly, Mars One's business plan hinges on a large and interested audience: "People are interested in a manned mission to Mars; Mars One uses this interest to finance the mission. A big audience has a lot of value" (MO FAQ: What is MO's business model?). On one hand, MO personnel imagine a connection between general public interest and sponsorships, "the more people show their enthusiasm for our mission, the more companies will notice people's interest in a manned mission to Mars, and

consider sponsoring our mission." (MO FAQ: What can you do). On the other hand, MO's basic business model requires a large audience that it can sell to advertisers. In this way, appeals to equality first attempt to distribute the project equally to the world, and then to turn the interest of a global public, as cultural capital, directly into financial capital.

Community

If the whole world has equal opportunity and capacity to contribute to the project, the larger point becomes that the whole world becomes bound into a single global community or public. In this way, MO gains a large public from which it can draw legitimacy and support. But more, MO gains a potent rhetorical argument. One team member notes, "Mars One has the potential to bring together the whole human race and make us rise to the challenges ahead with curiosity, creativity and mutual respect" (MO website: Eiso Vaandrager). This is echoed in the consistent promotion of the international collaboration that defines MO's teams of experts, future astronauts, and core staff. Positioning Mars One as a builder of global community, MO's staff argues for its legitimacy as an organization.

In this way, Mars One's staff members are deploying rhetoric as a technology through which individual supporters become communities. They attempt this by other means as well. For example, MO's staff maintains a photo album on Facebook showing supporters wearing MO merchandise. Through this technology, individuals who support MO by buying and wearing merchandise are consolidated into what can be rhetorically deployed as a group or community of supporters. Similarly, MO's staff keeps a tally of

financial contributions broken down by country, as well as a list of business sponsors on the website. Like the photo album, these technologies coalesce individual-level support into what Mars One's staff can claim is evidence of public support. Additional claims of mass support appear throughout Mars One's materials. For example, in several places MO's staff advertise how in the first month of its public existence, there were "500,000 unique visitors to our website, over a million hits to our YouTube movies, thousands of e-mails from enthusiasts, and dozens of interviews on websites, in magazines, and on radio and TV" (MO Newsmail, July). Armed with, at least the appearance of supporting publics, Mars One gains a useful rhetorical resource for consolidating additional business and individual support.

NASA and ESA as Foils

Discourse in the civil sphere is written in binaries. As Mars One operates within the civil sphere, it draws heavily on such binary oppositions. Throughout the corpus, MO personnel hold up governmental space agencies as foils, structuring binaries between heroic space entrepreneurs and bureaucratic agencies. These differences become grounds for Bas Lansdorp to note that before he founded MO, he believed that he had a great idea but "knew I didn't stand a chance if I went through the normal NASA or European Space Agency (ESA) procedures…" (Clifton, 2012).

MO ambassador Paul Römer asks, "What can [Mars One] do that NASA can't? That conversation made it clear to me, however *[sic]*. They think so creatively, and outside of the box" (Römer, 2013). Römer locates the difference in a mode of thinking; others do the same. Another ambassador notes, MO "is not a mission we can imagine

being attempted by current space programs, but Mars One's visionary idea to combine

media and aerospace in such an innovative way means it is possible" (Blaauw, 2013).

Norbert Kraft, MO's medical director, extends what others see as a difference in

institutional "mindset" (Enke, 2013) to the astronauts each organization selects.

Considering NASA, he notes, "currently, candidates chosen for space missions fit the

profile of '...adults who take directions and follow rules like an exceptionally well-

behaved child...'" (Kraft, 2013 [Kraft does not cite the source of this quote]). Against

this, he suggests MO's staff recognize the importance of creative problem solving and

teamwork, and will therefore select people who "understand that building a sense of

community before they land is imperative to their success."

But this difference in institutional "mindset" or modes of thinking is also seen as

emblematic of a deeper institutional difference. One advisor said in an interview:

> In the economic times as we have them now, they [governments] are
> unable to raise this kind money for the space agency … there is a
> discussion every year, is it a few millions less and now we have
> sequestration and probably the budget will be cut so there will never be a
> spike like there was in Apollo. Because it's not possible … you have to
> have another mechanism to raise money to follow the dreams or the
> explorer vision of humans and it can only be in a different way,"
> (Ehrenfreund, 2013)

Ehrenfreund looks to decreasing budgets as characteristic of an underlying structural

difference between commercial and governmental space organization. Another advisor,

Jamie Guined, who currently contracts for MO, picked up on institutional differences:

> Just a lot of red tape, just like any other governmental organization, is
> what I see has been the detriment to NASA at the moment, because we
> want to innovate and we have the ability to innovate as far as the human
> resources there, man, we have so many smart folks who work at NASA,

but it's just—it's really a challenge when you try to bring something new forward because of the process. And it's so time consuming. By the time you are able to see your idea come to fruition a year or more has passed—it literally takes that long—because all of the paperwork and the meetings and the approval process that you have to go through." (Guined, 2013).

As these quotes show, MO personnel rhetorically differentiate MO from NASA and ESA in both mindset and institutional and bureaucratic structures. However, it is important to note that MO personnel critique governmental space agencies while also playing up their experience working with these same agencies. As Lansdorp did above, MO personnel consistently lionize the Apollo missions. For example, following the news of Dennis Tito's plans to send a married couple to orbit Mars, MO tweeted "Mars Foundation is to Apollo8 as Mars One is to Apollo11, concerning fly-by vs landing" (Twitter, 2.22.13). Also, Mars One's staff has closely followed NASA and ESA missions through its social media presence.

In this section I have argued that comparisons to governmental space agencies allow Mars One to differentiate itself. In Alexander's structural account, meaning derives from such binaries. The larger point, however, becomes that Mars One personnel use NASA and ESA as foils to help articulate a positive, heroic, and legitimate identity for MO. Against narrow-minded and "red tape"-filled governmental programs, Mars One emerges as the only hope for achieving humanity's "dream." As such, it becomes the responsibility and burden of the whole world to support it.

DISCUSSION

In the previous section I argued that Mars One has adopted the participatory language and symbols of the civil sphere. In doing so, Mars One is strategically constructing and mobilizing publics to accumulate legitimacy, financial support, and cultural capital. I have also argued that Mars One serves as a highly visible and extreme case of the commercialization of the space sector. As such, this study indicates that other space entrepreneurs, similarly cut off from the legitimacy and resources of governmental space agencies, might also strategically construct and mobilize publics by adopting the democratic rhetoric and symbols of the civil sphere. In this way, this study hints at the ways that the more general commercialization of space may be pushing the space sector to be more "civil." Though the connections between Mars One and other entrepreneurial scientific organizations remain somewhat unclear, this case does suggest that greater focus on the civil sphere could be instructive for understanding how organizations navigate the increasing commercialization of scientific research (Mirowski & Sent, 2008). Similarly, Alexander's work, which reveals much about the workings and cultural structures of the civil sphere, could prove useful and generative to broader STS work.

As noted above, a number of scholars have been looking at the ways that public engagement activities designed and offered by scientific organizations create and design publics (Lezaun & Soneryd, 2007; Michael, 2009; Braun & Schultz, 2010), or the ways that "participating citizens appropriate and transform these roles and identities" (Felt &

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Fochler, 2010: 220). However, as discussed in more detail above, current PE literature fails to offer a rich and contextualized account of the strategic construction of publics by scientists or scientific organizations. That is, current research does not combine the investigation of the ways that PE activities create publics with a full recognition of the strategic mobilization of rhetoric to gain resources and publics. By showing the ways that Mars One strategically draws on the language and symbols of the civil sphere to construct publics as a means to gain legitimacy, money, and support, this case study highlights some of the gaps in current literature.

In view of these gaps, I suggest building on existing scholarship to initiate a new research program around the scientific construction of publics. This program would look to the ways that scientists create, convene, and mobilize publics through technical, media, and rhetorical practice. By coalescing and expanding existing literatures around public engagement and science and technology studies, a SCOP program would make significant analytical and empirical contributions to the PE literature in a number of ways.

First, this paper has hinted at the difficulty of characterizing and describing Mars One. Though it is pursuing space colonization, MO's staff members note that it is "not an aerospace company" (MO website: The Technology). Instead, they refer to MO as an "apolitical integrator," (MO website: Roadmap). While MO's staff members mean only that Mars One is a company that integrates other businesses, this is a particularly apt descriptor. MO attempts to "integrate" television, science, media, engineering, exploration and advertising. Similarly, one of the key findings of this study has been how as Mars One steps into and draws on the resources of the civil sphere, it takes on more of

a "political" character. In both ways, it becomes necessary to recognize MO as some sort of hybrid organization. Even though STS scholars have interrogated hybrids and hybridity (ex. Latour, 1993) for decades, much PE scholarship has focused on more traditional governmental scientific organizations (ex. Felt & Fochler, 2010) or commercial organizations (ex. Goven, 2006). If Mars One is paradigmatic of the increasing hybridity of space organizations and we must recognize the proliferation of hybrids in both the sciences and the world generally, a SCOP program would have to leave open space to treat hybrid organizations in rich and detailed ways.

Second, this case study describes how Mars One has stepped into the civil sphere, drawing on its rhetoric and symbols as a means to construct publics and (attempt) to accumulate legitimacy, money, and support. That is to say, I have located Mars One's democratic rhetoric in the cultural structures of the civil sphere. Similarly, Mars One only begins to make sense when placed within the context of the more general commercialization of the space sector (ex. Lambert, 2010). Scientific organizations are not spontaneously generated from the æther, and neither is the rhetoric of participation they employ. Just as it is important to locate organizations in larger contexts, historical moments, and spheres, it is important to recognize that scientific actors strategically select and deploy language, symbols, and activities to gain resources. This suggests a basic starting point for a SCOP program: the imperative to situate both scientific organizations, and the rhetoric they employ within larger spheres, contexts, and structures.

Third, in highlighting the way Mars One is drawing on democratic rhetoric to accumulate specific resources, this case study emphasizes the *strategic* dimension of the

scientific construction of publics. Michael (2009), Wynne (2007), and Irwin (2006) note the ways that public engagement can serve as a strategic resource for scientific organizations in established positions of power. Similarly, a SCOP program would acknowledge the ways that the construction of publics, especially through PE activities and rhetoric, can likewise serve strategic ends. This pushes SCOP research to offer accounts that are better able to address the functional roles publics play in larger science-public relationships. This also picks up on Fochler & Felt's (2010) suggestion to consider both the creation of identities for publics and the ways such roles are taken up or performed by individuals. In doing so, a SCOP program includes openings for more critical work, interested in interrogating the role of the construction of publics within larger power dynamics involving scientists and publics.

Fourth, this case study suggests the importance of taking rhetoric seriously as a thing in itself. Many of the actual opportunities for public engagement offered by Mars One grant only minimal participation. However, MO consistently employs grand, far-reaching participatory rhetoric. Regardless of the "reality" of these opportunities, this study shows that rhetoric itself must be seen to be playing an important role independent from opportunities for public participation. While some scholars have looked at the role of rhetoric in the construction of publics (Irwin, 2001), mostly, scholars have not taken up this work in detail. A SCOP program would leave open space for a thorough consideration of both practice and rhetoric. In advocating "the relative autonomy of structures of meaning" (Alexander, 2011: 11), Alexander's work provides one useful justification for such an analytical distinction between practice and rhetoric.

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