"MY BATTERY IS LOW AND IT'S GETTING DARK": THE OPPORTUNITY ROVER'S COLLECTIVE PERSONA

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ABSTRACT

The Mars Exploration Rover Opportunity operated on Mars from 2004 until it was disabled by a dust storm in 2018. Its demise was declared in February 2019 after months of unsuccessful recontact attempts by scientists at the National Aeronautics and Space Administration (NASA). This announcement sparked a global outpouring of grief that demonstrated people understood and related to the robot in a notably human-like manner. In short, it had been given a collectively understood persona. This paper presents a study of 100 digital postcards created by users on a NASA website that demonstrate the ways in which people expressed love, grief, hope, and thanks for Opportunity's fourteen years of operation on another planet. In presenting this case study, the paper argues that certain personas are collective achievements. This is especially likely to occur for robots and other inanimate objects which have no centrally controlled or developed persona. The paper is situated within existing persona studies literature to extend and stretch the definition of persona studies and therefore expand the field in productive ways to incorporate the study of non-human personas.

KEY WORDS

Opportunity Rover; Mars; Non-Human; Robot; NASA

INTRODUCTION

On February 13, 2019, science journalist Jacob Margolis posted a message on the social network Twitter that said the National Aeronautics and Space Administration's (NASA) Jet Propulsion Laboratory (JPL) was preparing to send the final message in a months-long attempt to rouse the dormant Mars Exploration Rover (MER) Opportunity (Margolis 2019a). Opportunity and its twin, MER Spirit, had been on Mars since January 2004 and had continued to operate well beyond an initial 90-day mission window. Although Spirit had ceased transmission in 2010, Opportunity continued into 2018 until "a severe Mars-wide dust storm blanketed its location" (NASA 2019). The rover was solar-powered and the dust storm had cut off its access to sunlight. On Twitter, Margolis further posted: "The last message they received was basically, 'My battery is low and it's getting dark'" (Margolis 2019b). This message was later separated from the context in which it was posted and widely claimed as a literal final message from Opportunity (Margolis 2019c). Opportunity did not respond to any of the messages sent from Earth in 2019 and so the mission was declared to have reached its end (NASA 2019). Subsequently, NASA established a dedicated webpage under the broader mars.nasa.gov website which invited users to send messages in the form of digital 'postcards' to Opportunity (NASA n.d.*a*). At the time of

writing, over 30,000 such postcards have now been created and remain displayed on the NASA website. Users can press a button that refreshes the postcards to display a suite of 15 at a time.

Can a robot die? If not in the physical sense, might we consider such a robot dead if it ceased to operate after 14 years on the surface of another planet and its space agency invited the global human population to mourn it as if it had died? Margolis' interpretation of Opportunity's final transmission gave a very human sense of death to the end of the rover's mission, while the collective outpouring of grief evidenced in the digital postcards and other locations are reminiscent of that following a celebrity death. On NPR, Simon (2019) characterised Margolis' tweet as a "poetic translation of the digital bursts, bytes, and squeaks Oppy [Opportunity] sent out before going silent", concluding "we might all hope for such a gentle end to a useful life." The demise of this robot elicited widespread emotion. People talked to and about it as if it had lived and it had died. In doing so, they displayed an understanding of Opportunity as a persona - one with which they could communicate and empathise.

This paper argues that Opportunity is best understood as a collectively achieved persona, a conceptualisation that may prove fruitful for expanding and stretching both the definitional and methodological models for understanding, accessing, and assessing personas and their presentation. Marshall, Moore & Barbour (2020, p. 3) have argued that "*persona is not a collective*" (emphasis in original) but is instead "a way to negotiate one's self into various collectives". I am not directly contesting that viewpoint, but I am seeking to extend the concept of persona so that certain types of persona can be understood as a collective *achievement* as demonstrated through the case study presented in this paper. This aim is achieved through a careful textual study of artefacts such as a sample of the postcards described above and other prominent contributions to understandings of Opportunity's persona, such as Margolis' viral tweets. The collective achievement of this persona is possible because this robot, though itself a collective achievement of all the relevant teams and organisations that contributed to its creation and operation, does not have a centrally controlled persona. In the absence of such a centre, collective understandings of the rover's persona have nonetheless developed among its fans and space aficionados around the world.

This paper is situated within the existing persona studies literature, with extensive reference especially to Moore, Barbour & Lee's "five dimensions of online persona", being "public, mediatised, performative, collective and having intentional value" (2017, p. 1). It demonstrates that while the online collective achievement of Opportunity's persona includes many of these dimensions, it challenges others. This re-contextualisation of a non-human persona challenges what our understanding of persona might be. If persona studies is "the close study of the public self" (Barbour, Marshall, & Moore 2014, n.p), how might we interpret robots with clear personas that people write to, speak to, or mourn when they do not have a clear 'self'? The ways in which people responded to Opportunity's demise demonstrate that persona may be more than a unified, created (or curated) identity, particularly for such non-human objects. Instead, the personas of these objects can be dispersed and collective attempts at meaning making.

ROBOT EMISSARIES

The fact that Opportunity, like Spirit and indeed other extra-terrestrial rovers and probes, was a stand-in for human beings in travelling to environments we ourselves cannot yet access is another key aspect to its development of a collectivised public persona. Along with a myriad of other spacecraft and landers, both on Mars and elsewhere in the solar system, these rovers constitute the primary means by which human beings access and experience places that we

cannot currently attend in our embodied human form. Such robotic spacecraft are our primary means of accessing and understanding the Solar System since "what all robots have in common is that they perform tasks that are too dull, dirty, delicate or dangerous for people" (Hubbard 2005, p. 651). This includes, for the present, exploration outside cislunar space (that is, beyond the Earth-Moon system).

Messeri contends that "Mars was made a place due in part to images of local landscapes" (2016, p. 118). Gorman likewise notes that "The palette of the solar system outside the blue Earth has grown… Martian reds are familiar now as we've followed the journeys of rovers" (2019, p. 188). The landers and rovers, including Opportunity, that provided hundreds of thousands of detailed images of Mars have assisted in human conceptions of the planet as a place which we might someday visit ourselves. Whereas the phenomenologist Merleau-Ponty argues that the body constitutes "our means for having a world" (2012, p. 147), such rovers and other spacecraft might be understood as our collective means for inhabiting places such as Mars. Such vehicles are clearly suitable for projections of persona since there is no human form in which persona can imbue. In this way, Opportunity becomes an extension of humanity, in much the same way that McLuhan famously defined all media in the title of his famous book as "the extensions of man" (sic), (2013 [1964]). But it is important to remember, as Clancey asserts that, "people are exploring Mars, not robots", because "people are exploring Mars using robots" (2006, p. 66).

Opportunity and Spirit were one further step in a decades-long Mars exploration program carried out by NASA and other global space agencies (NASA, n.d.b). They were the second and third rovers landed on the planet, after Sojourner, which launched from Earth in 1994. As of 2021, NASA's rovers Curiosity and Perseverance and the China National Space Administration's Zhurong rover are all operating on the planet's surface, as are several stationary probes.

Robots, a category to which this collection of rovers and spacecraft can adequately be assigned, have long been a target for projections of persona-like characteristics and anthropomorphisation. Sandry suggests that although "Scientific discourse is generally biased against anthropomorphism… social robots research has, for some time, been open to the idea of encouraging anthropomorphic responses in humans" (2015, p. 337). Former Director of the NASA Ames Research Centre, G. Scott Hubbard (2005, p. 650) notes that the popular conception of robots "comes from science fiction", citing Isaac Asimov's *I, Robot* and the *Star Trek* films and television series. Historical cultural narratives of robots have positioned them as "artificial people", "similar to humans in shape and size, able to communicate and be communicated with in familiar ways" (Sandry 2015, p. 336). Miller (2021, p. 11) suggests that one of the reasons for the deep cultural currency of robots has been their "potential to realize our imagination of the anthropomorphic machine that closely resembles a human being." While the rovers, which are more like cars than humans, do not physically resemble human beings, they do indeed share certain faculties of vision, motion, and limb dexterity with us and this ingratiates them into human social understandings even while they are physically at a great distance from all humans.

Popular media sources have widely anthropomorphised Opportunity. For example, the webcomic xkcd (2010, 2015) popularly presented both Spirit and Opportunity as capable of human-like thought and actions. Hubbard (2005, p. 653) contends that this generation of rovers presents a model of human-robot interaction in which:

> *Instead of a supervisor human dictating to a subordinate robot, the human and the robot converse on essentially equal footing to exchange information, ask questions, and resolve differences.*

Sandry's study of human-robot teams found that "developing a social understanding of a robot with which one is required to work strengthens the human-robot team, enabling and effective use of both human and robot abilities" (2015, p. 336). Likewise, Vertesi's ethnographic study of the scientists who controlled Spirit and Opportunity demonstrates a sense of close embodiment between these scientists and their machines wherein the human scientists contort and move their bodies to mimic or help understand the capabilities of the robots (2012).

Given the description of Opportunity as a 'robot', it is pertinent also to consider its position within the context of the emergence of other forms of online 'bots' that contain distinct personas with which people interact. Bots are "software applications that perform automated tasks over the internet" (Ford & Hutchinson 2019, p. 1013) or simply "non-human agents" (Burgess & Baym 2020, p. 112). Varol et al. (2017) found that between 9% and 15% of Twitter accounts were bots. They may perform conversational tasks, automatically generate content in reply to user interaction, create spam or noise around popular topics, or a range of other tasks. Burrough acknowledged that "a Twitterbot is likely to be perceived as a social actor", which "are shaped by their online audiences" (2016, p. 15).

The Opportunity rover can be situated within broader histories and understandings of robots, which include anthropomorphised machines, extensions of ourselves and our abilities, and a developing model of interaction that also includes bots accessed and experienced online. Within this framework, projections of humanity and a sense of persona upon such a machine is likely to occur. The next section more closely traces the ways in people's collective understanding of Opportunity's persona is visible within the postcards displayed on the mars.nasa.gov websites.

BUILDING A ROVER, COLLECTIVELY

The NASA webpage (n.d.a) where users can send a postcard to Opportunity remains online and active at the time of writing. New postcards can still be created and sent and the collection of postcards can be viewed at any time. To 'send' a postcard, users select from a collection of 10 images of Mars captured by Opportunity and Spirit, including one that features the rover itself, two that show clear views of its tracks in the Martian regolith, one that is filled by the rover's shadow, and another which shows a mark made by the rover in the soil. The others show close-up features of geological features of Mars and a setting sun over a crater rim. An eleventh image shows an artist's impression of the rover on Mars rather than a photograph. After selecting an image, users write their own message to the rover, which is displayed in a postcard format with a receiver address of "Opportunity Rover, 2.35 S, 354.65 E Endeavour Crater, Meridiani Planum, Mars 012504". These are the coordinates of the rover's final location. Each postcard is signed "A Martian fan", although some users have taken the opportunity to sign off with other names, which may be real or pseudonymous. The postcards also display a postmarked stamp image which reads "Planet Earth 2019".

The website's 'View' tab shows a collection of 15 postcards at a time, which appear to be randomly generated. On a single day in March 2019, the author took 150 screenshots of this website after using the built-in refresh button to build an expected corpus of 2250 postcards, which was then nearly 10% of the total of around 23,000. By mid-2021, the apparent total number of postcards was over 32,000. However, on closer inspection of the material generated, it was clear there were a significant number of non-unique postcards. From a subset of 240 postcards, only 100 were found to be unique. NASA has not responded to multiple requests for access to a larger number of the postcards and it remains unclear how many are actually available or how the website generates the 15 displayed in any given visit. The remainder of this

analysis focuses on the sample of 100 postcards. It is not claimed that these are fully representative of the total, but they are indicative of the ways in which users attribute persona-like characteristics to the Opportunity rover and they do form a rich qualitative data set. This resource proves fruitful for the arguments made in this paper because it is an online source of user-generated content containing multitudinous perspectives on Opportunity, even though it is not the sole source of cultural ideas about what or whom the rover might be or represent.

The analysis shows that a vast majority of the postcard writers anthropomorphised the rover, referring to it directly as "you", using nicknames, and expressions of mourning such as "RIP" (for rest in peace). Others thanked the rover, expressed love and gratitude, and acknowledged its efforts as if those efforts were of the rover itself and not the humans who had designed, built, maintained, and operated it. Broadly, the postcards are observed to contain the following content types, with indicative samples for each:

- science/research/discovery: "Thank you for the amazing things you've discovered and helped us to learn. It's unbelievable what you and the team has been able to do. God speed."
- love or emotional attachment: "I love you Oppy. I love you Oppy. I love you Oppy. Youve (sic) helped us so much and been so strong. I love you Oppy. Goodnight cowboy."
- grief: "Its (sic) been a week since you were declared dead. But I still get sad everytime I think about you.You [sic] did amazing, you beautiful and hardworking girl."
- thanks or gratitude: "Thank you for everything Oppy!"
- hope or expressions for the future: "Thank you for making our planet more hopeful and exciting, I'm so sorry we couldnt (sic) get to you in time to sing you Happy Birthday like you deserved."
- support for NASA: "Thank you for the journey. I wish NASA continued success and look forward to the next adventure. [name]."

Many postcards include more than one of these elements. At least 10% of the 100 postcards were signed off with the name of one or more people (including organisations), some of which are readily identifiable while others are more obscure.

PERSONA IN THE POSTCARDS

The collection of postcards examined for this paper offer a rich resource of persona-like attributions for Opportunity. Moore, Barbour & Lee's "five dimensions of online persona", being, "public, mediatised, performative, collective and having intentional value" (2017, p. 1), are all present in the collection of postcards, although to varying degrees and with different emphasis than might be expected of other online personas. This paper is the ideal source upon which to build the primary framework for analysis because it strongly sets out the ways in which persona might be constructed online and the postcard data used in this case study is, indeed, an example of online persona presentation. This section explores each of these five dimensions in greater detail, along with other contributions from the persona studies literature, to further develop the central claim that Opportunity presents a clear example of a collectively developed persona.

Moore, Barbour & Lee (2017, p. 2) suggest that online activity is "almost always public in some way" and that this publicness is central to the development of an online persona. NASA/JPL managed Opportunity's social media persona primarily by posting about the rover in

a dispassionate manner on the main @NASAJPL Twitter account. Unlike other missions since (for example, Curiosity), Opportunity did not have its own active social media accounts. In a study of the use of social media by United States Government science organisations, including NASA, Lee & Van Dyke (2015, p. 537) concluded that "While they shared a lot of information, they did not make suggestions about how publics should use the information." To some extent, this role of active persona creation was filled by non-official accounts such as @SarcasticRover, which plays into a wider history of parody Twitter accounts (Highfield 2016). The social media accounts that NASA did operate, and non-official accounts performed by other actors – whether bots or human-curated – contribute as social actors to the wider perception of Opportunity's persona. Without a centrally curated persona, people developed an understanding of Opportunity's persona via other means, and these concepts are evidenced in the postcard sample.

Opportunity's persona is reminiscent of many celebrity personas in which publicness is the primary form of accessing and understanding a celebrity given the distance between them and fans. However, whereas other celebrity personas are "highly polished, scheduled and controlled" (Moore, Barbour & Lee 2017, p. 3), Opportunity's is dispersed much more widely. It is useful to recognise that in this regard Opportunity is not dissimilar from some celebrities for whom persona is "multi-dimensional and versatile" (Deflem 2019, p. 42). Likewise, the outpouring of grief evident in the sample mimics reaction to celebrity death given "mourning is an exercise in persona construction" (Culbert 2020, p. 52). To this end, the sample includes six expressions of grief as in the words "sad" or "cry", three mentions of "RIP"/"R.I.P"/"rest in peace", two direct mentions of death, and six other mentions of rest as a euphemism for death. Leaver & Highfield's study of Instagram user's posts related to funerals found that posts were "far more about articulating the mourner's emotional state in their own social media spaces rather than eulogising or attempting to shape the deceased person's legacy" (2018, p. 43). The content of these postcards likewise demonstrates intense emotional connection and reaction to Opportunity's mooted 'death'. However, importantly, the postcard space cannot be said to be the user's own social media and nor are there a lack of eulogies for the rover itself. Thus this site is clearly distinct from many forms of social media even as it shares certain characteristics with those platforms, an aspect to this dataset which is discussed further below.

In centring their emotional state in public website submissions as a response to the rover's reported demise, users of the postcard side are performing a relationship to Opportunity and, by extension, its creators and others who share a connection with the robot. Burrough (2016, p. 12) describes in which they are both "being" and "becoming" through online interaction with a self-representing Twitter bot. In that project, the self is represented through the interaction of two versions of the Twitter account, "two 'I's involved in the process of knowing" (Burrough 2016, p. 12). The postcard creators are likewise involved in a process of relating to a being, Opportunity, by also writing their own persona into being in the postcards. This is, perhaps, especially true for those postcards which are signed with some form of name.

The second of Moore, Barbour & Lee's (2017, p. 3) dimensions of online persona is mediatisation, a process for which the "contemporary assemblage of persona now combines multiple media technologies". Given the rover is literally at a great distance from Earth, the development of its persona also necessitates a highly complex technological mediation. Opportunity's capturing of a "selfie" from the surface of Mars (JPL 2018) involved not only the usual technological gadgetry of online media such as "cameras, digital image compression algorithms, and communication across wireless or telecommunication carrier signals, APIs, and hashtags" (Moore, Barbour & Lee 2017, p. 3), but also other spacecraft, ground based receivers, and NASA's internal image capture, processing and publication infrastructure, to say nothing of

the greater complexity required for its facilitation of scientific research. The development of Opportunity's public persona thus places even greater emphasis on mediatisation than other personas might, and this too is recognised in the postcard sample. Three messages directly mention photographs and images captured by Opportunity, including one which refers to its selfie. A further seventeen mentioned science, exploration, research, or discovery.

The performative element of Opportunity's persona differs markedly from that described for other forms of person in Moore, Barbour & Lee's study. This is because there is no entity which has performed Opportunity's persona in any persistent or controlled manner. There is no "we" who can be the subject of the actions described in the following sentence:

> *To present a publicly mediated persona, we must perform our identity, our profession, our gender, and effectuate our tastes, interests, and networks of connection, through activities like commenting on posts, liking other's contributions or framing a selfie* (Moore, Barbour & Lee 2017, p. 4)

Instead, it is in the collective performance of attachment and relationship to this robot in which Opportunity's persona is achieved. Users who voluntarily contribute to the NASA website to write and display postcards to Opportunity are collectively performing an understanding of the machine's persona in much the same way as users of any social media site. While the aim, arrangement, and content of the postcard website does not fit the general definition of social media, the postcards certainly can be recognised as user-generated content (van Dijck 2009). The postcard webpage forms a kind of "networked public", "simultaneously a space and a collection of people" (boyd 2010, p. 41). Within this space, users generate and then post content related to Opportunity which helps to reinforce and create the space itself and relationally generate the persona of Opportunity identified in this sample of postcards. Despite this aspect of the site, it is clearly functionally distinct from other online spaces which may perform the same roles, especially social media sites. This is because the markers of most social media sites, defined by boyd (2010) as persistence, replicability, scalability, and searchability, do not apply. Although the material is persistent, it is not linked to any individual and is irretrievable, save by the method described in this paper. It is replicable as all digital media are, but its searchability and scalability are limited by the technical functions of the site. The site, and the posts made by users contained within it, perform a function as a collective persona site for Opportunity but not a substantial persona-building resource for the users.

However, user deployment of naming practices when names or other identifying information are otherwise not required for posting to the site indicates a desire for a certain level of performative identity given "both anonymity and pseudonymity allow people to enact specific, and arguably valuable, identity practices online" (van der Nagel & Frith 2015, p. 2). In some cases, the names given by users appear to be readily identifiable, such as in the following example: "It's a lovely bright sunny day here in [city], [country]. I hope your journey on Mars is going well. Lots of love from the [name] family xxx". Such a post is a clear move toward performativity of the connection between this family and the Opportunity rover, which in turn builds toward the collective achievement of Opportunity's persona. This stands in contrast to the point made above and indicates a clear rejection of the relatively limited affordances of the site compared to others in allowing users to perform their own identities. Instead, it is Opportunity's persona which is most clearly and strongly performed. Finally, although Opportunity is a non-human object, a number of postcard writers sought to project human-like gender identity onto it in their postcards. Opportunity often is referred to by male pronouns or labels, such as the three separate references which label the rover as "space cowboy" and another use of the phrase "best boy". One example notably refers to Opportunity as a "beautiful

and hardworking girl" and another message is addressed to "u [sic] and your baby sis […] my beautiful girls."

For Moore, Barbour & Lee (2017), the fourth dimension of online persona is indeed a collective effort, although again with a different emphasis than as shown in this case study. Whereas in their collective, the individual who curates or is centred in a persona can be seen to "produce, seek out, and move between connections" (2017, p. 5), this is simply not applicable to the collective-derived persona demonstrated here for Opportunity. Instead, the idea of Opportunity acts more as a central activating figure around which various "micro-publics" activate to collectively produce a persona. Again, this relates to boyd's (2010) description of the networked public, a space in which users might collectivise their contributions to creating a shared sense of the object which has brought them together. That persona, as demonstrated in the varying genders ascribed to it shown above, might have differing meanings for different publics, but nonetheless the postcard sample still demonstrates a tangibly conceptualised persona around which users of the postcard site have gathered.

Moore, Barbour & Lee (2017, p.7) posit as the final dimension of online persona an intent to generate a persona which has "value, and how that value is dependent on agency, reputation, and prestige." This is a difficult aspect of online persona to reconcile with Opportunity's persona as collectively achieved in part through the postcards described in this paper. Although the choice to engage in postcard-making might be highly performative, as described above, the affordances of the site itself offer limited reputational value given the way in which the postcards are displayed and since they are largely irretrievable once created. There is no login or apparent history retained by the site for a user to view any postcards they have sent and no in-built mechanism to save, print, share, or download any postcards created. Of course, users may use other means to capture and display their postcards and at least one sample seems likely to have been written with this intent: instead of a postcard to Opportunity, one user of the site has used the postcard format to write to his children. We can infer an intent to capture and present the postcard to them given the text, which reads: "[Name 1], [Name 2], [Name 3], [Name 4] this is a reminder of the tings [sic] you can accomplish in life. Daddy you loves you from Earth to Mars and back." Some other users of the site direct their postcards to entities other than Opportunity, most notably mentions of JPL/NASA, either directly or via an indirect name such as "team", for example: "You have been a part of our family since lift off. Kudos to the whole team for a job well done."

Formulations such as these, with direct addressing to either family or the human beings behind the rover missions, demonstrate affective states which indicate intentional value associated with them. Often, the postcards include geographic identifiers, which allows them to be situated with a wider context of the spatial self, which is a collection of practices where "individuals document, archive, and display their experience and/or mobility within space and place in order to represent or perform aspects of their identity" (Schwartz & Halegoua 2014, p. 1647). Leaving aside the stellar scale of geography suggested by the postcard quoted above ("from Earth to Mars and back"), such tags still situate users within the geopolitical contexts of Earth itself. This extends also to the affordances of the site which automatically places Mars as the destination address and Earth as the origin. Within the persona studies context, Morrissey & Yell (2016, p. 31) note that "utterances are enunciative acts which emanate from bodies, even in cyberspace" and that these are both reflective of and in response to affective states. Therefore, the affective nature of many of the postcards contained within this sample demonstrates the kind of agency, reputation, and prestige inherent to the final value dimension of Moore, Barbour & Lee's five dimensions of online persona.

Conclusion

As evidenced by the collection of postcards surveyed for this study, Opportunity's persona is a collective achievement. It is an idea dispersed across different people, fans, and organisations. The postcards are not the only possible sites in which Opportunity's persona might be found, but they offer a rich case study which can assist in stretching the boundaries of the persona studies discipline. Alluded to but not addressed in detail in this article are instances in which Opportunity's persona resides amongst those who built and operated it, at JPL/NASA, and among other sources such as cartoons, parody Twitter accounts, and other sites. Its presentation in this postcard dataset is related to but distinct from other forms of social media. More widely, the spacecraft's persona can be seen as a projection of hope and desire related to human exploration of the solar system writ large since it stands in for us in a place we cannot access in person, and in this way it is an extension of earlier culturally significant robots. It has certainly been mourned as such. As Gorman has noted, "Spacecraft are far more than just technology; they are woven into systems of politics, belief, and emotion" (2019, p. 73). These systems are collective positions, and so too is Opportunity. Opportunity's persona is not an "individual is connected to multiple publics" (Moore, Barbour & Lee 2017, p. 6), but arises entirely from collective understandings that link into the sociotechnical systems of JPL and NASA, but also of others around the world for whom Opportunity was an entity that could be mourned upon its demise.

While the users quoted above were mostly anonymous, and a number of those who did sign the postcards with identifiable names have done so as representative of organisations or perhaps pseudonymously, the postcards represent a collection of user-generated content that shares many similarities with social media content. Such material is used for understanding and positioning the self within wider constellations of others and this may be accomplished through a variety of means including direct reference to people, places, and organisations which hold meaning for the user concerned. The references to Earth and its relationship to Mars may also be read to signal an intent or hope to move beyond geopolitical configurations with the hope of discovery inherent in projects such as the exploration of Mars.

Opportunity's persona has indeed been achieved by a messy collective, containing differing positions held by different users. But in the absence of a more directed persona-building effort, those who hold affinity for Opportunity have demonstrated a collective achievement at persona-building through the corpus of postcards displayed on NASA's website. The global process of mourning completed the anthropomorphisation of a non-human entity that had nonetheless spent more than a decade as a human emissary on another planet. The many thousands of respondents to the NASA website demonstrate individual and collective understandings of what (or who) Opportunity was, in much the same way as Margolis' poetic viral interpretation of its final message. The project offers an opportunity to extend persona studies beyond the human, starting with objects which are frequently assigned human-like personas as in the example of the MER Opportunity.

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