

Technologies for Sharing: Lessons from the Quantified Self Movement about the Political Economy of Platforms

Abstract

Quantified Self (QS) is a group that coordinates a global set of in-person meetings for sharing personal experiences and experiments with self-tracking behaviors, moods, and activities. Through participation in U.S.-based QS events and watching online QS presentations from around the globe, we identify a function of ambiguous valuation for supporting sharing communities. Drawing on Stark's (2011) theory of heterarchy we argue that the social and technical platforms supporting sharing within the QS community allow for multiple, sometimes conflicting, sets of community and commercial values. Community cohesion benefits from ambiguity over which values set is most important to QS members. Ambiguity is promoted by sharing practices through at least two means, the narrative structure of members' presentations, and what counts as tracking. By encouraging members to adhere to a three-question outline, the community ensures multiple values are always present. Thus it becomes a question of which values this sharing community emphasizes, not which values sets members present, at any given time. By leaving the tools and methods of tracking open—from sophisticated wearables and data analysis to pen-and-paper and storytelling—the community creates space for and embraces self-trackers with a broad spectrum of technological proficiency and interest. QS as a group capitalizes on circulation of knowledge valued somewhat ambiguously to sustain and grow the community, both encouraging and supporting the commercialization of self-tracking technologies while keeping technology developer interests from overwhelming community-building interests. This, we argue, has implications for researchers hoping to understand online communities and the “sharing economy” more generally.

Keywords

Quantified Self, self-tracking, heterarchy, ambiguity, sharing, theory

Introduction

Sharing has become a key concept of the digital economy. From sharing rides and homes to data and updates, sharing in the so-called “sharing economy” reveals an often fraught relationship between community values and commercial values across a range of behaviors and experiences. The “sharing economy” is built on the seeming contradiction of fostering genuine community connections while maintaining room for commercial activity and monetized exchange. Critics point out that *sharing* is a miscategorization of the approach and intent of for-profit companies that mistakes “Silicon Valley’s idealized self-image for reality” (Schor et al., 2015). For-profit “sharing economy” companies face the problems of simultaneously supporting community-building goals and fostering commercial interests (and often profits). Do the concepts and practices of *sharing*—in contrast to other types of exchange—help these organizations and networks exploit strategic ambiguity?

For this paper we turn to Quantified Self (QS), a group that organizes in-person meetups in cities around the world where people share their experiences with self-tracking. Quantified Self is an international network for exploring self-tracking and self-tracking devices, with the intention to “help people get meaning out of their personal data” (Anon, “About the Quantified Self,” 2012). QS is situated at the intersection of a rapidly growing industry and a social phenomenon, and the QS group is loosely structured as a collection of global “meetups.” The term quantified self is also used to describe a wider social phenomenon of self-tracking practices and tools, and we will reserve capitalization to refer to the named group, not the wider set of practices (see Boesel, 2013). QS actively encourages and structures the sharing of personal health and wellness data. Through face-to-face meetings, online networks, and social media, QS

community members share their data, stories, ideas, and experiences about their own personal data tracking—from sports performance to health and symptom tracking to productivity at work.

We use the practices of the QS group as a case study for the relationship between ambiguity, sharing, and community cohesion.

We argue that the QS community promotes the sharing and circulation of multiple forms of knowledge within the community, in part through a *détente* that helps keep commercial values and community values both in play. They do this in part through a stance of scientific relativism, in that the community holds many different types of experiments—from technologically-driven ones that develop new tracking tools to expressive, qualitative experiments of personal discovery—as equally valid. Scientific values are not the only ones deliberately kept open and ambiguous in QS. Ambiguity is embedded within the foundational organizing structures of QS, and we argue that ambiguity within this sharing community ultimately supports community cohesion. We argue that QS shows the role that ambiguity can play as a mediator between otherwise opposing systems of community and economic values in sharing networks of practice. This is important because the process within the Quantified Self community of relying on ambiguity to mediate multiple (and at times conflicting) values may mirror similar processes in so-called sharing economy ecosystems and platforms.

Sharing in QS is organized around “asking big questions about our self-tracking tools and what we do with them” (Boesel, 2013). In this sense QS is an interesting site for reexamining how sharing practices figure into the “soft resistance” to commercial quantification of data (Nafus & Sherman, 2014). However, the technical, social, and economic platforms that connect the QS community rely on what John (2013) calls “the fuzzy objects of sharing”—in this case a

self, a set of experiences, narratives, data, and tools that the community constructs as quantified. QS members often refer to themselves as a community (often using the description “QSers”), and while those members include people who work for the technology companies looking to commercialize and monetize personal data, including self-tracking data, the ethos of the community is one of sharing, not commercial activity. Members are savvy enough to understand the enormous market potential for personal data (health or otherwise) and are yet optimistic about how such data is transformed within sharing communities, either ones of their own choosing and making, like QS Meetups, or of network effects. A session title for the 2015 Quantified Self Europe Conference asked members to consider “Why should I share my data?” (<http://quantifiedself.com/2015/09/qseu15-preview-share-data/>), even though as QS members they are encouraged to present with their data, talk to others about their data, and get advice on how to better collect, analyze and interpret their data. They both share, and reflect on their practices of sharing personal data.

At the heart of exchanges in the QS community are “n of 1” or individual-level data generated from a personal experiment to track an experience, behavior, attitude, mood, or activity. Such data embody, literally, community members’ health and experience. Yet, somehow through these distinct datasets of $N=1$, intimate, individual data become a resource for building and linking the community, defining its boundaries, and bridging diverse interests in tools, data, and narratives. The multiplicity of shared goods, coupled with the community’s networked structure, allows for the spread of the community across digital platforms and is facilitated by the formation and circulation of ambiguous values.

In this paper we take up two challenges. The first is to consider how sharing practices within QS affect the valuation of data. While most data shared within the QS community is collected at the individual level, sharing within QS transforms these data in a way such that individuals do not fully “own” the data, as implied by the common definition of sharing, nor is data fully relinquished to others because of its origin in an individual’s body or lived experience. Quantified Self community members find value within each other’s narratives and data, even if they can never fully reinscribe another’s data set into their own body or translate it to their own experience. As a QS data narrative is shared, members naturally seek a connection to their own experiences, and in doing so imbue the data with meaning beyond the meaning assigned to it by its creator. For QS there is never a clear answer to which is the “best” or “correct” way to quantify the self. As a result, what the community values is also, perhaps intentionally, kept unclear by organizers.

The second challenge that we take up in this paper is to consider how these ambiguous values maintain the community’s connectedness. We use the concept of “heterarchy” (Stark, 2011) to explore ambiguity as a productive organizing principle and argue that values which might on the surface be considered at odds can both co-exist within such networks, and also provide for their cohesion. For this we draw on the literature from economic sociology that suggests that ambiguous valuation plays a social function in establishing the rules and norms for exchanges in sharing groups like QS. When multiple values are in play simultaneously, such as community values and commercial values, then the work of innovators is to recognize how to keep these multiple values ambiguous in order to appeal to different kinds of people. As Stark (2011) puts it, “It is always within accounts that we ‘size up’ the situation, for not every form of

worth can be made to apply and not every asset is in a form monetizable for a given situation” (p. 25). The social and technological platforms built for sharing in networked communities support multiple goals and ends. In the case of QS, the valuation of scientific merit and community needs are kept ambiguous as people share their own quantified self data within the network.

In this paper, we draw upon our observations of participation in the Quantified Self community. We attended QS Meetups and conferences in the United States in three cities. We also watched online videos of presentations given at QS meetings around the world and participated in the online discussions of the community through social media such as Twitter. We interviewed QS members about their experiences with the community and participated in a larger project on the future of health technology innovation. We draw on this data to answer the following questions: (1) What does the experience of the QS community tell us about how digital objects are shared, particularly when the value of those objects is uncertain? (2) How do the sharing practices of the QS community promote the formation and circulation of ambiguous values? (3) How does this ambiguity function to sustain the community across platforms? We argue more broadly that the socio-technical infrastructure of QS provides affordances and constraints that shape how people approach sharing and how people benefit from sharing. Specifically QS members’ presentations of their data to the rest of the QS community produce and support multiple sets of sometimes contradictory values that emphasize both the self-understanding and technological development facets of self-tracking. These values are not clearly delineated and maintaining the ambiguity surrounding them helps to hold together a heterogeneous community. Examination of the values that are embedded within and

communicated through QS presentations lets us see how ambiguity is created, circulated, and utilized to support a cycle of sharing that ultimately maintains the community.

Quantified Self as a Sharing Community

In 2007, Gary Wolf and Kevin Kelly, former editors of *Wired* magazine, founded the Quantified Self. The QS movement has grown from a single meeting of 28 people in Kelly's San Francisco Bay home to "an international collaboration of users and makers of self-tracking tools," a global network of geographically-clustered communities participating in self-tracking projects, discussion, and support, in (at the time of this writing) 207 locations in 128 cities in 38 countries (See Anon, 2012; Boesel, 2013; Ferriss, 2013; and quantified-self.meetup.com/all/).

Quantified Self Meetups are organized and sustained by members via Meetup.com or similar platforms. QS is surprisingly loosely organized and is more of a clearinghouse for people interested in self-tracking. Participation (along with the nature and degree of self-disclosure) is voluntary. The leadership of QS (i.e. Wolf, Kelly, and those involved in QS Labs) has minimal formal ties to local groups. They provide a link to group records via QS.com. The groups listed on the QS website may not explicitly label as QS but instead use synonyms for the community's goals, affiliating themselves through values rather than branding. These groups—including Effective Altruism Melbourne, Biohack Columbus, Internet of Things Entrepreneurs, and Hacking Somerville Happiness—reflect the multitude of value facets that fall under the QS umbrella.

Still, many members of these local groups self-identify as "QSers" or "self-trackers" and refer to the results of their projects as "data." The explosion of consumer-technologies for sensing and data collection has fueled the growth in self-quantifying practices and the QS

community (Nafus & Sherman, 2014), and the range of motivations behind these practices includes “healthism,” interests in visualization, the “allure and power of metrics” and a technoutopian view of the perfectable body (Lupton, 2013). Even with the breadth represented within the QS network of practice, the community does not include all of the self-tracking movement, and people who track some aspect of their life do not necessarily identify with QS, the community (see Neff & Nafus, forthcoming).

Quantified Self members come together to support their knowledge, skills and practices of self-tracking. On a broad level, self-tracking entails “converting previously undetected bodily reactions and behavioral cues into traceable and perceptible information” (Ruckenstein, 2014, p. 68). Although self-tracking is not a new phenomenon (Moschel, 2013), recent technological developments have made small wireless devices such as Fitbits, Fuelbands and the Apple Watch available on the commercial market and have radically expanded the range of personal objects/conditions (e.g., blood glucose levels) and behaviors (e.g., sleep patterns) that are available for tracking, deepened the level of observable nuance within our bodies and behaviors, and altered what, how, and through what means we share about ourselves. These newly sophisticated technological tools have “added a computational dimension to ordinary existence” (Wolf, 2011).

As an online community, QS is facilitated by a “headquarters” site, quantifiedself.com, which provides tools for existing and potential QS members, such as information on tracking devices, “how-to” guides for organizing Meetups, information on existing Meetups, and materials to stimulate discussion of self-tracking, such as forum posts and videos of self-tracking project presentations. In-person community events occasionally occur nationally or regionally,

such as the Quantified Self Europe Conference, most recently held in Amsterdam in September 2015, or the U.S. National QS Conferences that have been held in the San Francisco Bay Area. The movement relies on its members to organize and sustain local and regional chapters and in-person “Meetups.” Membership is fluid and largely marked by Meetup attendance. Participation in QS is varied and may involve simply attending Meetups, contributing to a captive audience, providing feedback on presentations, or presenting one’s own self-tracking project and seeking feedback from others. In this sense, QS resembles a “sociotechnical commons” (Turner, 2009, p. 73), where collaboration and feedback are encouraged in the pursuit of increased understanding. Regardless of their physical location, QS communities are united in their mission to provide a space in which “what these new tools of self-tracking are good for. . . can be explored on a human level” (Wolf, 2011). This space is online as well. Quantified Self made deliberate choices to support connections among the local chapters, circulate information among them, and highlight the work of individual members through their online forums, website, and sharing of videos from local presentations. We refer to QS’s online organizational structure as a platform, a sociotechnical arrangement that includes the technical, architectural, and computational choices made to support social networks, platforms of “opportunity,” and platforms “from which to speak” (Gillespie, 2010).

Quantified Self Meetups worldwide are centered on show-and-tell presentations where members voluntarily share their self-tracking projects; these are often filmed, with the best ones chosen for the QS website. Given in the style of a TED talk or IGNITE presentation, all QS presentations are structured around the same three questions: 1) What did you do? 2) How did you do it? 3) What did you learn? These questions shape but do not determine how community

members share what they tracked, their methods and tools, and suggest value sets that become embedded in the information shared to the community (Fiore-Gartland & Neff, 2015). We argue that these questions further reveal the ways members take advantage of the space that QS provides to explore self-tracking for different reasons and for different values while also underscoring the foundational organizing structure that connects all QS presentations and international nodes.

The objects of sharing in QS are narratives of personal data—individuals’ stories imbued with “n of 1” data that result in personal epiphany, directions for further inquiry, or development of a device furthering either of the previous outcomes. These presentations are almost universally agreed upon as the core activity within the global networked QS community. Reasons for being in the QS movement vary, although compared to the general population, QS members “represent a profoundly different way of knowing what data is, why it is important, who gets to interpret it, and to what ends” (Nafus & Sherman, 2014, p. 2). The central activity of in-person local meetings is sharing of personal data and stories through the “Show and Tell” talks. This shared structure is so fundamental to QS that it acts as both the foundation and mortar, supporting and uniting diverse and disparate groups into a cohesive community. Next we look at how sharing within the QS community functions as a community practice.

Sharing as a Community Practice

Sharing, by definition, is an inherently social activity, in that the practice requires at least a partner with whom to divide an object or resource. Beyond this characteristic, scholars have refined the concept of sharing by attaching the practice to context and content (c.f. Belk, 2010; John, 2012; Hemetsberger, 2012; Wittel, 2011). Sharing may involve material objects (e.g., an

orange) or immaterial concepts (e.g., feelings, emotions) (Wittel, 2011). The functional distinction between sharing material and immaterial objects hinges on the transformation of the object being shared. Sharing an orange is an act of division, or of “distribution,” in which the value, quantity, and ownership of a material object are divided through the act of sharing, and are, in a literal sense, negatively impacted (John, 2013, p. 169). Sharing an idea is “an abstract and passive” means of distribution in that the immaterial object is not divided or reduced in value (John, 2013, p. 169). Indeed, sharing immaterial objects “adds value to whatever is being exchanged” (Wittel 2011, p. 5).

Communication scholars who focus on online fan communities and peer-to-peer file-sharing have argued that the process of sharing can make immaterial cultural products such as music more, not less, valuable to their creators (c.f. Baym, 2013; Jenkins, Ford, & Green, 2013; Sinnreich, 2013). Data, too, may follow the same pattern of becoming more valuable with sharing as its meaning is assigned through a process of translation, mediated through a set of tools, devices, and technologies, and situated in institutional contexts (Fiore-Silfvast & Neff, 2013; Fiore-Gartland & Neff, 2015). Given the immateriality of personal data, sharing does not reduce or diminish the data, *per se*, and many in Silicon Valley are betting that shared data is more, not less, valuable because of what happens to data in the process of sharing. In community contexts, sharing can imply “exchange,” expectations of something either received previously or anticipated in return, dependent upon the expectations of reciprocity within the group/community (Belk & Coon, 1993, p. 394). Instances of sharing can “build trust, and over time they provide societal “glue,”” maintained over time through a “system of reciprocity” which, at its most

foundational, includes an implied social contract that all involved parties will preserve the trust developed through sharing (Eckstein, 2001, p. 830).

Networks do not require members to have a shared purpose, common vision or goals, or even shared understanding. Heterarchy is a model of organizing based on distribution production and networks of shared accountability (Stark, 2011). Within heterarchy, conflicting organizing and performance evaluation principles can coexist. Central concepts, goals, and ideals can come to mean different things to different people within the network. What is something worth, Stark asks, is a fundamentally different question from what is its worth to me, and people innovate by juggling multiple ways of evaluating something's worth, allowing them to perform a sort of cultural arbitrage between different sets of values. Thus entrepreneurship (and ostensibly innovation) comes from "the ability to keep multiple evaluative principles in play and exploit the resulting friction of their interplay" (Stark, 2011, p. 15). Innovation communities bring together multiple sets of differing values, as happened with "venture labor" in New York's early dot-com days (Neff, 2012).

Ambiguity can thus be used as a productive and generative organizing principle, allowing people to see the reflection of their own values in some of the other decisions and actions and choices within the network even when these values were not those intended. Ambiguity, along with "the lack of simple coherence that it tolerates increase the diversity of options," allows for more changes to "recombine" different options and values into new innovations (Stark 1996, p 7-8). Stark (1996) outlines three cases when ambiguity is used as an organizing resource. First, it is often used when there are complex, interdependent claims "that would nullify the very basis of collaboration" (p. 25). Second, ambiguity is useful when people are unsure of the extent to

which their work and claims will be interdependent with each other in the future. Third, ambiguity is useful when there is uncertainty about which value will be used or “what constitutes an asset” (Stark, 1996, p. 25).

The problem, then, for the QS community is which sets of values will be shared and maintained by its members and how the ambiguity around sets of values will be maintained. How does QS balance the pressures for being a testbed for Silicon Valley companies, a social movement of people challenging unidimensional measures for knowing their bodies and their experiences, a citizen science hobbyist group, or an interesting fusion of all these divergent interests somehow held together in one group? We argue that the ambiguity of the values within the community creates a resource for QS and helps QS resolve these questions. Is QS a tech community? A patient support community? A group for citizen science? It can be all these things, simultaneously, without having to commit to any one or give up on values that might be seen as contradictory. Ambiguity allows QS to appeal to those driven by personal narrative as well as those driven by technology innovation. It makes room for “soft resistance” to the quantifying of bodies and selves and narratives (Nafus & Sherman, 2014), and at the same time it welcomes a form of sharing that implicitly requires buy-in to a data-driven model of a technologically-enabled economy in which social networks of sharing are “monetized” into valuable (and privately held) assets. This is accomplished in part through ambiguity.

Ambiguity in Quantified Self: Between Commercial and Individual Interests

Heterarchical organizations use “asset ambiguity” to allow their assets to “operate in more than one game” (Stark, 2011, p. 15). For QS, the key assets are the knowledge and networks produced and the multiple “games” that these assets operate in are the ways that members draw on QS for

supporting their vision of self-quantification as a personal practice, as an emerging new technology industry, or as a way to challenge medical and scientific practice of quantification through so-called “large-N” studies. The questions that structure all QS presentations around the world make available multiple criteria for assessing worth or value. This means that members from disparate groups (e.g. those interested in self-exploration and those interested in developing marketable devices) can find value in presentations. Each of the local QS Meetup groups maintains the same protocols for sharing within the community, seemingly to balance the needs of community with those of industry networking for tracking technology companies and startups. These common protocols similarly ensure space for multiple needs and interests, effectively supporting ambiguity through community structure.

Ambiguity around the community’s values and mission draws on multiple accounts of worth, “productively” using ambiguity to preserve multiple different ways of accounting for what is valuable (Stark, 2011). Does sharing within the QS community privilege increasing scientific knowledge, expansion of technological (and commercial) capacities, or support for a community of people interested in self-improvement? The answer is intentionally unclear. Quantified Self presentations highlight both technology-driven projects which echo the excitement of commercial development of data-driven tools for self awareness and narrative-driven projects that reflect a common way that people connect to one another in communities.

The QS community’s interest in self-tracking is situated within a broader culture of self-tracking technology development and market expansion. Although many Meetups include a “Demo” hour open to startups interested in showcasing their technologies, QS presentations are strictly for personal presentations, even though the boundaries within the community between

technology developer and self-tracker can blur (Fiore-Gartland & Neff, 2015). While some members are working at building self-tracking tools at their day jobs, the boundaries between technology company interests and community member interests within QS is not clear cut.

This multiplicity of interests, in combination with the QS community's dual roots in self-exploration and technology culture, makes the process of assigning worth beyond an individual scale inherently and possibly intentionally messy. Quantified Self's structural and organizational choices facilitate its operation as a heterarchical network of practice. As a result, it produces ambiguity that allows for cohesion among people with diverse values. The sharing of self-tracking data and narratives is the primary means through which QS members pursue the stated intent of the community, of reaping meaning in their data (Anon, "About the Quantified Self," 2012). But QS's structure as a heterarchical organization means that a unified understanding or driving goal is not necessary for the community's continuation. As a result, individuals' conceptualizations of what is valued in and by the community represent a diverse and often conflicting range of values, the ramifications of which—for individuals, health care providers, and health technology developers alike—require further exploration beyond the scope of this paper.

QS Presentations as Expressions of Ambiguous Community Values

The differing narrative structures of QS presentations make the values of self-understanding and technological development especially available to members. By encouraging members to directly respond to what was done in a self-experiment, how it was done, and what was learned, QS organizers subtly enforce the simultaneous consideration of the community's two roots of self-understanding and technological development. The QS structuring questions supports an

individuated valuation of presented data, yet prioritizes values of self-discovery and technological innovation. With representation of both value sets, QS maintains ambiguity as to which set of values is most important.

This ambiguity extends to what “counts” as self-tracking technology. While the QS website gives considerable attention to the latest in self-tracking technology, even partnering with sponsors to provide QS members deals on tracking-related kickstarter campaigns, the community’s organizers are hesitant to place limits around “self-tracking technology” (Wolf, 2015). Quantified Self affords members a certain freedom regarding with which tracking tools to engage, even as many presentations emphasize technology development. As a result, the QS member narratives vary widely in their expression of technological sophistication.

For example, presentations with a relatively high emphasis on self-understanding may utilize devices with low levels of technological sophistication (e.g., pen and paper) or devices with little to no post-consumer modification (e.g., an off-the-shelf, consumer-oriented device like a FitBit). In a presentation posted to the QS site, Amelia Greenhall describes a “gold star” method of tracking personal accomplishments such as how many books she reads, activities that “make me happy,” and physical activity: She quite simply affixes gold star stickers to a pen-and-ink spreadsheet hung on her wall (Quantified Self, 2012). Greenhall explains that this project arose following an illness, when she began by keeping track of small accomplishments as a means of self-encouragement. Her tracking system, though lacking in technological sophistication compared to many of her QS peers, increased the visibility of incremental progress and provided personal motivation (Quantified Self, 2012). Greenhall emphasized her personal understanding and improvement through the discussion in her presentation, foregrounding the

third guiding narrative question, “What did you learn?” The narrative of personal experience reflects the QS commitment to community building as presentations provide material for the quantified selves to be known within the community as a set of qualitative stories about growth and change. Such narratives highlight the humanity of members, and in particular, contrast to the many other roles that members fulfill within a networked technology industry. The values reflected in such discussions are not those of new technologies or new scientific discovery but those of a group learning about and appreciating its members’ various paths.

In contrast, some QSers place more emphasis on the role technologies play in self-awareness. These presenters discuss how their tool (including devices, software, and analytic and visualization techniques) was used or modified to suit their personal project. They use a new (to the market or them) tool as designed, “hack” or customize an existing tool, or design a new one from scratch, and respond more directly to the QS question “How did you do it?” Not surprisingly, technology-focused presentations are the closest direct access that Silicon Valley and other technology developers have to the QS community, and any new tool unveiled there must, by virtue of the presentation structure, accompany a personal tracking experience of the presenter. This further supports the circulation of ambiguous values as the disparate ends of the value spectrum become blurred and layered, extending both commerce and community, as QS members hear about the new technologies and techniques that members’ companies are developing even as they learn new ways of doing their own self-tracking experiments.

One illustration of this negotiation between commercial and community interests is Dave Marvit’s presentation on a Post-Traumatic Stress Disorder (PTSD) iPhone app. In development by Fujitsu Labs and the Department of Veterans Affairs, the app is intended to aid patients with

PTSD by using biofeedback to track users' stress response while driving (Quantified Self, 2013a). In a nod to the personal understanding aspect of QS presentations, Marvit and a colleague relate their experiences testing the app on their own commutes. As a result, the self is a supporting component of the presentation, though the novelty of the app, along with its intricacies and development trajectory are clearly at the forefront. This is an edge case where a commercial prototype was demonstrated at a QS Meetup and is not representative of a large portion of QS presentations. Nonetheless, this case highlights the tension between the values of sharing in this community. Presentations must be expressly grounded in individual or "self" experiments, even if the tools, techniques, and devices used come from actors with expressly commercial interests.

Within the poles of presentations emphasizing self-understanding and technological tools is a vast space in which QS presenters variously balance these values. Many QS members combine interests in self-understanding and technology by identifying a behavior or issue of personal importance and carefully considering the "fit" of the device as a means of gaining insight into the issue, followed by "tweaking" or modifying the device if necessary. The QS presentation "Mark Leavitt on Tracking and Hacking Sitting" provides an illustration of interest in both behavior modification through self-tracking (dependent upon increased self-understanding) and an interest in creating a device that caters to individual user needs (dependent upon attention to technological aspects of tracking) (Quantified Self, 2013b). In the description posted with the video of his presentation, Leavitt cites a cardiac medical issue as a "wake up call" to increase his exercise while maintaining his habit of working at a computer (Quantified Self, 2013b). Leavitt "hacked" his favorite chair through a series of modifications that allowed

him to work at the computer from his chair while simultaneously pedaling on a mini-elliptical. Leavitt rewired the elliptical with LED lights that appeared green when he was pedaling and red when he was not; the duration of each computer session as well as the amount of pedaling done while seated were recorded via a connection to his computer (Quantified Self, 2013b). Leavitt's example highlights the coexistence of both self-understanding and technological development values, as his health issue provided an incentive to closely track his behavior and increase his understanding of self, as well as to develop a creative solution that would relate the success of his efforts. In his presentation Leavitt notes, "Science usually tries to drive emotions out of data, I think we want to drive the emotions back in. The data needs to tell us a human story—I want it to tell my story" (Quantified Self, 2013b). Leavitt's narrative is both emotional sharing *and* teaches about a technique. Such presentations bridge the disparate poles of self-understanding and developer, soften the contrast between these values, and illustrate that the value sets need not always be at odds (though it is important to note that this category lacks the marketability function of self-tracking technology that characterizes the developer values extreme).

Quantified Self notions of the self are fundamentally about embracing and supporting multiple standpoints of relativity. In other words, the QS sets of values that honor science of the self lend itself ambiguous scientist values and multiple ways of making things right for one person. Just as there is ambiguity surrounding what counts as tracking, a similar lack of definition surrounds what counts as the self within QS. This freedom allows the self to be represented by physical/emotional/mental health concerns or questions; a social conceptualization, involving how others interact with oneself; or a hypothetical 'other' self, as with app development. Your mileage may vary. Quantified Self members hold dear the notion

that multiple, even conflicting values about data and science can coexist and even inform one another.

Quantified Self exemplifies heterarchy because organizers capitalize on their capacities to promote ambiguous valuation about not only which values to privilege but also which tracking technologies and which tracked self are most valuable within the community. From who is allowed to speak during Meetup presentations, and about what, to how presentations are structured the question of whether QS values building a community of individuals or Silicon Valley style commercial expansion is left open. Thus, the three-question framework structuring all QS presentations creates space for multiplicity of meanings and valuations of knowledge. This space is maintained throughout the global QS community through its structure as a network of nodal communities. Each regional Meetup relies on similar protocols, and Show and Tell sessions are common throughout, ensuring that the space for ambiguity is built in to the network on a global scale.

Neither technology nor self-understanding are ever fully absent from QS narratives, and the values around technology and self-awareness play a key role in the community's cohesion, sustainability, and ability to keep commercial interests at bay. Reliance on "n of 1" data provides a tether from the individual to their data. While others can find and add meaning to this data, the community's emphasis on individual projects prevents data aggregation and, by extension, the potential for co-option by commercial interests (Lupton, 2014). Valuation of not only technological devices but methods for engagement support a broader, community-level appreciation of innovation or change. This appreciation influences but does not dictate goals of projects in the spirit of both self-understanding as well as technology development. The value of

innovation prevents stagnation within the community as members are encouraged to use, tinker with, and design tools that further their personal self-understanding missions; to reflect upon and take action based on lessons learned from data; and to seek feedback from QS members at large, ultimately fueling collaboration and community cohesion.

Conclusion

In this paper we have argued that the values of the QS community lend a particular flavor to the sharing of data and narratives from individual self-tracking projects. Quantified Self does so by embracing a relative ambiguity over which sets of values are most important within the community and whether the sharing of data, stories, or techniques are the most valued by the community. Ambiguity is created and circulated throughout the community via sharing practices and organizing structures such as the three-question narrative scaffold and broad definition of “self-tracking,” both common across global QS nodes. By simultaneously holding multiple and often conflicting value sets, such as self-understanding and technological development, in focus, the community’s organization reflects heterarchical structure. In the case of QS, these organizing choices function to ensure the community’s cohesion and prevent both internal stagnation and co-optation by outside commercial influences.

For scholars concerned with sharing, the QS case is an example of the ways that sharing transforms the meaning of intangible goods. Sharing personal data within the QS network of practice transforms its meaning beyond that of the initial presenter and establishes and strengthens the bonds among individuals in this network. Quantified Self illustrates the scale at which this can occur, moving sharing beyond dyadic relations and into global networks of

practice. That sharing can support and even produce ambiguity as a means of sustaining community cohesion contributes nuance to discussions of networked relationships.

For scholars interested in understanding QS, our work on the ambiguity of values shows how the network of practice navigates the tensions between what Boesel (2013) has called the ‘little qs’ of the set of practices of tracking and the ‘big QS’ of the more-or-less formal organization supported by the platforms for sharing personal data. Quantified Self sharing practices use ambiguity over which set of values are in play at any given time. The result supports QS as a site for “soft resistance” to big data practices—allowing the community to be aligned with commercial purposes at times and to the individual control and autonomy over data at others (Nafus & Sherman, 2014). That this is done over the same “object”—shared personal data—is telling of the cohesive power of ambiguous valuation within the QS community. This tether between what is shared and individual experience grounds the data within the community and implicitly engages community members in soft resistance to the transformation of their data into a monetizable asset that can be deployed for the expansion of commercial tracking markets. How QS preserves their values to support building the community in the face of such enormous commercial interest in its members as early adopters, as a collective testbed, and beta testers is significant both for future of QS, and for other networks of practice that navigate these commercial/community boundaries. That this is occurring while self-tracking and sensing are becoming popular in the mainstream is a testament to the durability of the platforms for sharing as structures for community building. In a moment when Silicon Valley interest is high, QS Meetups still manage to maintain a sense of that shared community is a model for what sharing communities in the digital economy might look like. Other networks of practice would do well

to learn from them how to hold onto community values in the face of commercialization and how to make commercially developed online communities operate more like genuine sharing communities.

Although this paper explores the potential of ambiguity to support community cohesion, it would be myopic to assume such ambiguity could not be utilized in other ways, say to mask nefarious intentions or conflicts of interest. Such questions require further attention in future research. In the case of QS specifically, ambiguity surrounding the relationships between and interests of QS organizers and corporate sponsors (realized or potential) requires further scrutiny. Similarly, QS organizers' silence surrounding the legitimacy of self-generated and interpreted data, and ambiguity as to the role of medical professionals in self-discovery and transformation, requires critical attention. This paper has attempted to identify the foundational, organizing structures that facilitate and support ambiguity in the sets of values in play, and has elucidated the types and scales of communities such ambiguity can in turn support.

Acknowledgments

Support from a gift from the Intel Foundation and support of the Institute for Advanced Studies at Central European University is gratefully acknowledged. Brittany Fiore-Gartland's field research on Quantified Self was instrumental in helping us to generate these ideas and we are grateful to Dawn Nafus for her insights. An earlier version of this paper was presented at the 2014 ICA pre-conference on Sharing. We are grateful to the participants there for helping push our paper forward. We especially thank Nik John and Wolfgang Sützl for organizing an excellent conversation around these themes and for their input in shaping this paper.

Notes on Contributors

Kristen Barta is a doctoral student in Communication at the University of Washington. Her research focuses on the affordances of digital spaces in fostering social support for survivors of trauma. Previous work examined journalism conventions of reporting on intimate partner violence and how service networks might be strengthened to reduce victim-blaming attitudes and misrepresentations of domestic and sexual violence in journalism.

Gina Neff, Ph.D., is associate professor of communication at the University of Washington and a senior data science fellow in the eScience Institute.. She wrote *Venture Labor* (MIT Press 2012) and *The Quantified Self* with Dawn Nafus (MIT Press 2016). She studies how people work with data in teams and groups and the changing responses of work to emerging information communication technologies. With Carrie Sturts Dossick, she co-directs the Collaboration, Technology and Organizational Practices research group on how construction teams use data for better buildings. Her research has been funded by the National Science Foundation, Intel, and Microsoft Research.

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