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Pioneer Communities: Collective Actors in Deep Mediatisation

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Pioneer Communities: Collective Actors in Deep Mediatisation

Andreas Hepp

Abstract

The aim of this paper is to draw attention to the phenomenon of media-related pioneer communities. The maker, quantified-self and open data movements have made clear how much an analysis of such pioneer communities can contribute to our understanding of changes in media and communication, together with related social and cultural changes. Pioneer communities do not only possess a marked sense of mission; they also develop ideas of media-related change that can provide orientation for broader social discourses.

Studying pioneer communities as intermediaries between the development and the appropriation of new media technologies permits us to grasp current mediatisation processes from the actor's point of view without the need to first ascribe to them any unifying media logic. Pioneer communities are significant collective actors in the process of 'deep mediatisation' – the far-reaching entanglement of media technologies with the everyday practices of our social world.

INTRODUCTION

If one studies the transformation of culture and society through media change a contradictory relationship is constantly encountered. On the one hand there are collectivities like the maker, quantified-self and open data movements that are well-advanced in the (partially experimental) use of media technology, something which is a defining feature of their communal existence. On the other hand, the everyday media appropriation of many people lags behind the practices of such groups, in some cases very markedly. All the same, the discourse generated by the first groups is reflected in that of the second, providing them with orientation in their everyday lives.

This represents a significant divide. On the one hand we have 'pioneering collectivities', pioneering in their use of digital media and in their creation of an imagined collectivity. On the other, we have the everyday appropriation of digital media that clearly diverges from this, but which is guided by the same ideas associated with this imagined collectivity. These two social phenomena do not exist in parallel, but are connected. However, it does seem that this connection cannot be grasped in terms of the 'diffusion of innovation' (Rogers, 2003); the practices and technologies of pioneer communities do not simply 'diffuse' to the everyday media use of other people. 3D-printing – the computer based production of 3D objects by layering liquefied plastic – as used in the maker movement, extensive self-measuring as in the quantified-self movement or open ways of data representation as in the open data movement – these all differ from what be expect of 'normal' media users (whether today or in the future). It is more that the use of media by these pioneering groups creates a horizon of *possibility* to which the everyday media appropriation of others orients itself, or at least can do so.

This leads us to something that has been widely discussed: digitalisation as a 'wave of mediatisation' (Couldry and Hepp, 2016: 34-56; Finnemann, 2014). Mediatisation can be defined as a 'metaprocess' (Krotz 2009: 22) of change, in which everyday practices increasingly rely upon media and become 'moulded' by them. Digitalisation and related datafication interweaves our social world even more deeply with this entanglement of media and practices. Given the significance of media today as a defining part of the *specific* character of our social world, we can understand the present stage of mediatisation as one of 'deep mediatization'.

However, what has not so far been studied empirically in any detail is that mediatisation is not a thing in itself, but is instead a process *promoted* by a specific group of actors. This idea

is something that can mostly be found in the popular press, often linked to some kind of conspiracy theory concerning the influence of Silicon Valley.

Manuel Castells (2001: 36-63) has provided a more analytical, and so more differentiated, characterisation of the movements 'behind' the technological development of the internet. In his view, this development cannot be understood without taking into account the way in which the internet is related to the 'techno-meritocratic culture' of universities, the 'hacker culture' of tech movements, the 'virtual communitarian culture' of early online communication, and the 'entrepreneurial culture' of newly-established businesses. In his analysis of these different 'cultures' as part of the 'culture of the internet' he describes specific communities of people who drove the development of the internet forward and linked this engagement with certain imagined collectivities. One historic example he had in mind was the 'homebrew computer club' of the 1970s, an important collectivity for imagining what we today call a 'personal computer'. A general characteristic of present media technology-related culture is that this work of imagination changes the world through technology. In his analysis of the move from 'counterculture' to 'cyberculture', Fred Turner (2006: 4) argues that the so-called 'new communalists' turned 'away from political action toward technology and the transformation of consciousness as the primary sources of social change'. These activists were to a great extent focussed upon an engagement with what were later called 'virtual communities' (Rheingold, 1995). From this perspective, new media technologies were increasingly 'romanticised' and considered to be supportive of new forms of collectivity (Streeter, 2010) – a discourse that persists (cf. Kelty, 2014: 204-207).

The basic thesis of this paper is that this is a core feature of a transformation in the construction of collectivities through media technologies. To exaggerate somewhat: changes in the construction of collectivities linked to media technologies are to a remarkable extent driven by particular collectivities which are, in respect of these changes, 'pioneers'. Henceforth these will be referred to as media-related pioneer communities. Communities of this kind are not only experimental groupings related to these new forms of media-technology-related change and collectivity formation. They also have a sense of mission: a sense that they are at the 'forefront' of a media-related transformation of society as a whole. Individual members present themselves in these terms in public and are the subject of ongoing reportage, whether this is in the blogs run by the pioneer community itself, or in the journalism of the more traditional media. To a great extent it is the *relationship* between ongoing media reportage and its appropriation through which the *potential* for transformation of these media-related pioneer communities is realised. The everyday world

of the wider public is less involved with the extremes of this 'pioneering vision' than with the gradual transformation of much more basic practices. All of this can be seen as part of an ongoing *deep* mediatisation, a stage of mediatisation in which our social world becomes closely entangled with media. Studying pioneer communities turns up evidence that shows it would be too limited to understand deep mediatization as a phenomenon driven by a unifying media logic. Instead this example indicates that we should 'open' the 'black box' of media-related logic(s) and introduce a more empirically-grounded actor perspective into our analysis.

My aim here is to provide a conceptual and theoretical account of this core feature, intending also to lay some foundations for future empirical research. I will use my own media-ethnographic research as well as other work on maker, quantified-self and open data movements to construct a more complete account of the phenomenon of a media-related pioneer community. First I will outline some features common to these three movements, then bring them together in relation to the concept of a media-related pioneer community. In conclusion, I will consider the extent to which media-related pioneer communities can be treated as collective actors of deep mediatisation.

THE MAKER, QUANTIFIED-SELF AND OPEN DATA MOVEMENTS AS EXAMPLES

As outlined above, we can identify at present three particularly important media-related pioneer communities: The makers, quantified-self and open data movements (cf. table 1). While being partly related to each other, these collectivities have to be understood as different social domains: differing according to the practices employed in forming a community (respectively manufacturing, subjectivity and publicity); in their conceptions of media-related collectivity; in the events they stage; and in their form of publication (websites, journals, reports).

It is not easy to locate the origins of the *makers' pioneer community* (or movement, in their self-designation). 'Hack spaces' and 'fab labs' (and not only 'maker spaces') are important locations for members to meet for exchange and technological production, and the 'hacker movement' (Levy, 1984) and its 'hacker spaces' (Kostakis et al., 2014) are also important precursors of makers. There is still a link today between hacker and open-source movements (Krebs, 2014: 20). The 'do it yourself' (DIY) movement is also of importance (Atkinson,

2006), having a long tradition in Europe and the US as a 'community of practice' (Wenger, 1999). In both instances, the makers' movement differs because it is a more focused group, dedicated to change through technological developments. As a pioneer community, makers emerged around 2005, the year that Neil Gershenfeld's book on 'FabLabs' – 'laboratories' to 'fabricate' on your own – and 3D printing appeared; *Make: Magazine* was launched by O'Reilly, and the first faires were held in Silicon Valley.

Table 1: Exemplary media-related pioneer communities

	Social domain of community	**Conceptions of media-related collectivity**	**Important events and locations**	**Important websites and identity-creating publications**
Maker	Predominantly oriented to practices of manufacturing	Conceptions of collectivity based on the 'internet of things', as technologies of making and sharing Interest in pace of innovation and connectivity	- Maker faires - Maker spaces, hack spaces, fab labs (partly as chains like TechShop)	- Anderson C (2012) *Makers: The New Industrial Revolution*. New York, London: Random House - Make: Magazine' / website (http://makezine.com), since 2005
Quantified self	Predominantly oriented to practices of the self	Conceptions of collectivity based on technologies of self-measuring Interest in datafication and media omnipresence	- Quantified Self Conferences - MeetUps	- Quantified Self website (http://quantifiedself.com), since 2007
Open data	Predominantly oriented to practices of publicity	Conceptions of collectivity based on open knowledge Interest in differentiation and datafication of media	- Open Data conferences and OK Festival - MeetUps	- Gray J, Chambers L and Bounegru L (2012) *The Data Journalism Handbook*. Beijing, Cambridge: O'Reilly Media - Hacks/Hacker website (http://hackshackers.com), since 2009

Important for the further spread of this community was the introduction of the Arduino board in 2005, the RepRap Open Source 3D printer in 2007, the first MakerBot 3D printer in 2009, the availability of the raspberry PI microcomputer in 2012, and the publication of the book *Makers: The New Industrial Revolution* by the Ex-Wired editor Chris Anderson (2012a). The book popularised the idea of the 'internet of things', the production and representation of 'things' through and by the internet (for the present discussion see Greengard, 2015). Even more importantly, the book offered a kind of condensed ideology for the makers' pioneer community and its imagined collectivity. In short, they came to be represented as a 'community of equally obsessed people from around the world' (Anderson,

2012a: 15; 73-77; 92-95), a community which shares the vision that the 'internet of things' would unleash a 'new industrial revolution', bringing DIY, craftsmanship and self-made technological innovations together. The makers understand themselves as pioneers of the *pace of innovation* and of an increasing *connectivity* of the media: introducing technological (media) innovations for a better life through the intensified connectivity of the 'internet of things'. This is in turn founded upon a new conception of collectivities based on technologies of sharing. This 'technological utopianism' (Sivek, 2011: 189) – which we can also find in *Wired* magazine (Frau-Meigs, 2000) and in publications like Jeremy Rifkins *The Zero Marginal Cost Society* (Rifkin, 2014) – characterises the conception of collectivity promoted by *Make: Magazine*, which is now part of *Maker Media* (CEO: Dale Dougherty), the company that also organises *Maker faires*. The magazine and the faires reinforce the sense of a community of 'makers' who share an optimistic vision of a future in which craft and technological developments merge. Since 2012/13 various 'mini maker faires' have supported the spread of this 'movement' in Europe (Schmidt, 2013: 1). Yet, the main anchors remain the locally founded 'maker' and 'hacker spaces, the latter having their own tradition in Europe.[1]

As our preliminary analysis shows, there is a certain parallel in the media coverage of this pioneer community in Germany and the UK.[2] However, makers have so far been mainly studied with respect to localities of alternative knowledge production and practices, and partly from a (media) pedagogical and co-working perspective (cf. for example Bilandzic, 2015; Gauntlett, 2011; Kostakis et al., 2014). Far less attention has been paid to their character and engagement as a pioneer community, and the details of their conceptions of media-related collectivities.

The q*uantified-self movement* has recently attracted much interest in academic research. What is now known as the 'quantified self' refers back to what was called 'life-logging' (O'Hara et al., 2008), which began as a kind of artistic and self-experimental community. In 2007 two *Wired* journalists – Gary Wolf and Kevin Kelly – founded the website quantifiedself.com (Nafus and Sherman, 2014: 1787). Another parallel to the makers community is that this website brings together producers as well as users of various technologies, and organises conferences on the possibilities of and experiences with self-tracking. Local groups are mainly organised as 'meet-ups' (meetup.com). However, there are as yet no widely accessible and identity-creating publications for this pioneer community.

[1] See https://wiki.hackerspaces.org/List_of_Hacker_Spaces; Bardzell et al., 2015; Hyysalo et al., 2014

[2] See for instance articles on the makers' community that first appeared in the *Guardian* in 2009 and in *Der Spiegel* in 2011 (*Make: Magazine* was first mentioned in both publications in 2005/6)

Since 2011 the quantified-self movement has become increasingly related to the health industry. Parallel to this, a number of specifically designed devices and 'smart objects' (shoes, clothing, etc.) have been introduced (Singer, 2011; Swan, 2012). Technically, the quantified-self movement is based on possibilities connected to *datafication* in combination with the *omnipresence* of digital media devices, substantiating the idea that it is possible to collect all kinds of self-related data everywhere. In Europe the community has been active for several years, beginning in London in 2010 and in Berlin in 2013. Again, this development was accompanied by media coverage – the first articles about this kind of pioneer community appeared in *The Guardian* in 2010 and in *Der Spiegel* in 2011. Research on the quantified-self movement was especially driven by human-computer interaction (HCI) studies, focusing on the elements of individuals' self-tracking from a cognitive or social psychological perspective (Lupton, 2014a: 2). More sociologically oriented studies explore self-tracking practices using different foci: the different 'modes' of self-tracking (Lupton, 2014b), the 'practices' of self-tracking (Nafus and Sherman, 2014), the 'gamification' of self-tracking (Whitson, 2013), the 'reification of the body' in self-tracking (Zillien et al., 2015), the appropriation of these technologies in 'health and wellness communities' (Fiore-Gartland and Neff, 2015), and involving issues of 'privacy' and 'surveillance' (Becker, 2014; Frick, 2014) – to identify some of the relevant areas of research. The existing research from this perspective provides some first indications on the specific nature of this pioneer community. What its members call a 'quantified-self movement' is driven by a pioneer community that shares an interest in the application of (media) technologies to practices of the self. Here the imagined collectivity takes the form of a discourse foregrounding data-focused collectivities; it represents a 'new individualism' that 'involves concentrating on the self' and excludes 'social groups, organisations or communities' (Lupton, 2015: 183).

The o*pen data movement* has been treated as a very particular pioneer community (Peters and Broersma, 2013; and the special issue 'Theories of Journalism in a Digital Age', *Journalism Practice* 9(1), 2015). While the concept of open data as represented by the Open Data Foundation (http://opendatafoundation.org) is much more far-reaching and also includes the idea that a new form of government can be developed through general access to public data, tech enthusiasts working in journalism engage in a new kind of public discourse that builds on interactivity, mediating information through open data and data-visualisation. This journalistic community has roots in the open data movement, with close links to the more computer-oriented open-source movement (Baack, 2015; Coleman, 2013; Lewis and Usher, 2013). The 'Hacks/Hackers' network lies at the core of the journalism-related open data community. It was founded in 2009 in San Francisco's Bay Area as a network of

journalists ('hacks') and technologists ('hackers') seeking to rethink the future of news and information (http://hackshackers.com). It grew rapidly in the US and then went international, founding chapters to begin with in Latin America, then in Europe and Australia. In June 2015 it had more than 88 chapters around the world connected via the service Meetup.com and other digital platforms, and it has 'grown to become the largest organization of its kind' (Lewis and Usher, 2014: 384). Again, there is a closeness to the digital media industry, evident in the launch of an event series called 'Connect' in May 2015 conducted in partnership with Google. Hack/Hackers is an important network in the wider pioneer community of the open data movement. The network has a special interest in *datafication* and the *differentiation of media* with respect to new forms of publicity, and as a practical discourse about data journalism (Baack, 2015; Gray et al., 2012). This is perhaps best expressed by the term 'hacker journalist'. According to self-descriptions, the 'hacker journalist' helps 'people learn about their world' and is engaged in seeing 'how software as civic media might contribute to some sort of democratic or social good / making the world a better place' (Stray, 2011; Lewis and Usher, 2013: 603). Matters relating to the collectivity should be discussed in public, making data transparent for users (Parasie and Dagiral, 2013). Most research on open data and journalism is focused on the question of how journalists can take advantage of these technologies and the organisational pressures related to this (cf. for example Anderson, 2012b; Broussard, 2014; Creech and Mendelson, 2015; Knight, 2015; De Maeyer et al., 2014; Flew et al., 2012). One of the rare studies of the community sheds light on some aspects of the imagined collectivities related to open accessible shared data; in the various 'Hack/Hackers' chapters these are treated as 'informal trading zones' between journalists and hackers (Lewis and Usher, 2014: 388).

A PRELIMINARY CONCEPTUALISATION OF MEDIA-RELATED PIONEER COMMUNITIES

A comparison of the maker, quantified-self and open data movements shows up extraordinary parallels: they all originated in the San Francisco Bay Area; they were initiated by a relatively small 'organisational elite' (Hitzler and Niederbacher, 2010: 22); they spread relatively quickly through Europe, both transnationally and transculturally, the most important European centres being Amsterdam for The Netherlands, Berlin for Germany, and London for the UK; and they understand media technology as a key instrument facilitating 'new' and 'better' forms of collectivity. In brief: in their different ways, all three share a belief

in the possibility of a productive change of culture and society through digital media, and are dedicated to promoting such change. With reference to this, three points appear central.

Firstly, these collectivities have to be understood as media-related *communities*. They are forms of sociation whose members not only share a sense of 'common we', but who have together created structures intended to be relatively long-lasting. As communities, they are 'post-traditional' (Giddens, 1994: 56; Hitzler et al., 2008: 9-19) since their membership is self-selecting, and they are 'deterritorial' (Hepp, 2015: 205-215) since their networks spread across various locations and territories.

Secondly, these pioneer communities are *media-related* in that they are constituted by technical means of communication. The core of their communality relates to media. They are in this regard 'media-related communities' (Couldry and Hepp, 2016: 168-189), arising first through progressive mediatisation, and inconceivable in the absence of media. Whether we are talking of maker, quantified-self or open data movements, none of them is conceivable without technical means of communication, since they all in one way or another relate to media technologies. Even those movements critical of particular ways of using media technologies, like the Fixer Movement (Charter and Keiller, 2014; Kannengießer, forthcoming), cannot exist in the absence of media technology. It is for this reason that they are *media-related* pioneer communities.

Thirdly, these are *pioneer* communities. Borrowing from the concept of 'mobility pioneers' (Kesselring, 2006: 333), which relates in fact to individuals, not communities, it can be said that these communities are pioneering in a dual sense. On the one hand, their self-perception is that of the 'pioneer': in some way or other their mediatized character is not yet fully diffused through culture and society, and so in this sense they understand themselves as being 'ahead of their time'. On the other hand, this very self-consciousness fosters a sense of mission, pioneers engaged in the building of 'bridges' in the drive to bring about media-related change. Members of media-related pioneer communities mobilise their core character in seeking to change the collective construction of the social world.

As for the frames of relevance for way in which a community is formed, the three examples considered in this section can be treated as exemplars of the three forms of media-related pioneer communities. The makers movement is oriented to particular shared *media-related practices of manufacturing*. The quantified-self movement is oriented to particular shared *media-related practices of the self*. The open data movement is linked to *particular shared media-related practices of publicity*. All the same, there are many interlinking and cross-

cutting connections between pioneer communities flowing on the one hand from the common interest in media technologies, and on the other from their shared pioneering character.

We can understand pioneer communities neither as simple social movements, nor as think tanks; they are more a kind of hybrid that finds its specific nature in its orientation to media-related change.

This intention to bring about social change is something that is shared with *social movements* in the wider sense. Social movements are a distinct social process, mechanisms through which actors engaged in collective agency are in a conflictual relationship with clearly identified opponents (Rucht and Neidhart, 2002; Touraine, 2002). Such actors are linked by dense informal networks and share a distinct collective identity (Della Porta and Diani, 2006: 20). Media have long played an important part in the self-organisation of social movements, also being used to gain a wider public for their political aims (Cammaerts et al., 2013; Gamson and Wolfsfeld, 1993; Mattoni and Treré, 2014). Like social movements, pioneer communities have informal networks, a collective identity and a shared aim for action. More particularly, they come very close to 'technology-oriented and product-oriented movements' (Hess, 2005: 516), like the open-source movement (Tepe and Hepp, 2008). However, pioneer communities are generally not involved in comparable conflict-driven relations with identifiable opponents in the way that social movements are.

In addition, pioneer communities are much more open to new forms of entrepreneurship and policy-making, lending them an affinity with *think tanks* (McGann and Sabatini, 2011). In general, think tanks are 'policy-oriented, knowledge-intensive idea producers and processors' (Hart and Vromen, 2008: 136). More precise definitions emphasise their character as 'non-governmental institutions' that 'want to influence policy, but have no formal decision-making power' (Pautz, 2010: 276). Pioneer communities here share with think tanks their ability to produce ideas, and also the effort devoted to influencing policy and public. Furthermore, there could be other similarities between think thanks and pioneer communities since 'new generation think tanks operate on a different model, enabled by the internet' (Pautz, 2010: 276), and the social change that they seek to further is becoming more technically oriented, and less political.

Within this hybrid character pioneer communities are a particular kind of *collective actor*: empirically, they are above all complex figurations of individuals, people who are commmunicatively in contact with each other and whose action is related to the frames of

relevance of the specific community, condensed in media-related practices – of manufacturing, of the subject, and of publicity, to name the ones discussed here. Within these figurations there is a constant exchange of views about the *aim* of common action, how media-related changes of culture and society might be possible, and how the community imagines this might happen – these all form the common basis of action. Pioneer communities are also treated as 'supra-individual actors' (Schimank, 200: 329) in public discourse on them, in a clear parallel with the way that more usual social movements are treated. This relationship becomes of interest if we examine the role of pioneer communities in processes of mediatisation.

PIONEER COMMUNITIES AS COLLECTIVE ACTORS IN DEEP MEDIATISATION

Pioneer communities are of great interest for work that seeks to link changes in media and communication to social and cultural transformations; they provide us with insight into the relationship between those developing media technologies and the everyday appropriation and use of these technologies by 'normal' men and women. In this sense, pioneer communities can be understood as 'cultural intermediaries', 'a special occupational grouping linking production to consumption' (Negus, 2002: 502f.; cf. Bourdieu, 2010: 359). This 'in-between' status, between production and consumption, has a broader relevance here, however, since the members of pioneer communities are only in exceptional cases the developers of the basic technologies that they use. Instead, they intermediate between developers in firms and everyday appropriation, seeking to influence the latter, while also being an important resource for creativity and providing a potential pool of *future* developers.

It is worthwhile considering media-related pioneer communities as collective actors, since this opens up an empirically-grounded way in to the forces transforming mediatisation. As I suggested above, it is common in media and communication research to treat mediatisation as a 'meta process', which has 'consequences' for those actors involved in it (members of particular institutions like politicians and everyday media users confronted with changes in media and communication). It has become usual to describe mediatisation, like globalisation and individualisation, as a higher-level and hence abstract process of transformation (Hepp et al., 2015: 316-18; Lundby, 2014: 12-14; Verón, 2014: 163-65). More substantively, it is then a matter of studying the manner in which humans and particular institutions adapt to the

media, something which is especially common in the area of political communication (see for example the contributions in Esser and Strömbäck, 2014).

This is linked to the idea that a particular 'media logic' exists (Altheide, 2014) to which individuals and institutions must adapt, or alternatively, against which they develop means of resistance. This 'media logic' is often treated as a process whose realisation is synonymous with mediatisation, but it is open to different interpretations, and is described in an increasingly differentiated manner. Discussion of mass media today tends to focus upon a mixture of a 'logic' associated with professionalised journalistic production and the demands of commercialised media production, to which others have to adapt (Landerer, 2013; Strömbäck and Esser, 2014: 249). And there is a tendency when dealing with digital media to treat media logic(s) as media technological 'affordances' (Gibson, 1967; Hutchby, 2001) which structure human interaction, so that digital media develop a specific logic (Hjarvard, 2013: 27-30; Miller, 2014: 110-111; van Dijck and Poell, 2013).

This conception of mediatisation as the propagation of a 'media logic' involves a reification, placing the process beyond the domain of human agency (see Hepp, 2013: 38-46). Mediatisation appears to be something that 'happens' all by itself, moreover, something that 'happens to us'; not something that we ourselves create. The limitation of such 'logics' has been identified and discussed by Peter Berger and Thomas Luckmann (1966: 82) as an attribution to institutions from an observer's point of view. In the perspective of 'Actor-Network Theory (ANT) a 'logic' would be a kind of black box, for the positing of such a logic renders 'technical work … invisible' (Latour, 1999: 304 – he writes that 'technical work is made invisible by its own success.').

If we try to bring these different lines of argument together, we can conclude that it is unproductive to assume the existence of particular logics embedded on their own in media as institutions and technologies. It makes more sense to think in terms of 'reciprocities' (Simmel, 1992: 19) between the actions of very different actors, the unintended consequences that pushes onward the process of mediatisation, creating media-supported influences that contribute to the endurance of a technology and its infrastructure. Pioneer communities, given their intermediating activity, are therefore important components for an understanding of the dynamics of mediatisation. Pioneer communities can be treated as collective actors in *deep* mediatisation because they push the reflexity of this process in a dual sense.

First of all, knowledge in such communities is highly 'reflexive' (Giddens, 1990: 36-45), since they are engaged in a continual process of interpretation of themselves and their own action

in the process of mediatisation. This can be seen at work in the meta discourse conducted within these pioneer communities over issues in the transformation of media and communication, exemplified in the websites and publications of the maker, quantified-self and open data movements (see Table 1). It can be assumed that this kind of reflexive discourse is constitutive for media-related pioneer communities. As collective actors, they promote particular media-related practices and imagined collectivities, seeking to realise these as in the example of the 'New Industrial Revolution' (Anderson, 2012a: 17); and in this way they reflect both the contemporary and historical aspects of the transformation of media and communication. These communities are thus 'pioneers' of a self-reflection upon mediatisation (even if this reflection is seldom critical). This is related to the way that its members, at least in their own self-perceptions, see themselves as in the vanguard of mediatisation in different spheres, and act accordingly in relation to mediatisation.

Second, media-related pioneer societies are 'reflexive' because they deal in a particular way with the unintended consequences of mediatisation (Beck, 1992; Grenz and Möll, 2014; Möll and Hitzler, 2014). This sense of mission is very much connected to their strong interest in shaping these unintended consequences, involving a form of 'meta reflexivity' (Archer, 2012: 206). Their response is typically to react by seeking to drive media technological development onwards, a pattern familiar from the development of software (Pfadenhauer and Grenz, 2014). Here again there is a similarity with the maker movement. In their key texts one can find passages, which can be read as a critique of the unintended consequences of earlier phases of mediatisation. Chris Anderson (2012a) writes in his book *Maker* about how after his childhood he lost contact with craftwork because of his preoccupation with the computer and digitalisation as the last wave of mediatisation:

But as I got older, I stopped returning to my grandfather's workshop and forgot about my fascination with making things. Blame screens. My generation was the first to get personal computers, and I was more enthralled with them than with anything my grandfather could make. I learned to program, and my creations were in code, not steel. Tinkering in a workshop seemed trivial compared to unlocking the power of a microprocessor. (Anderson, 2012a: 11)

Here we can hear a critique of the unintended consequences of mediatisation that parallels the arguments of Richard Sennett (2009) and of Sherry Turkle (2015). It is clearly a problem for Anderson that the computer meant that his generation lost contact with the material production of things. But his response does *not* involve giving up on computers. On the contrary: in the media-related pioneer community of the 'new maker movement' (Anderson,

2012a: 47) the response is to drive mediatisation *further onwards*. This can be done by developing the 'internet of things' (Greengard, 2015), the possibility that, by using 3D printers, computerised designs ('bits') can be transformed into physical objects ('atoms'). He develops the idea of a 'community' that makes possible 'collaborative improvement of existing ideas or designs' (Anderson, 2012a: 74), paving the way for the 'next industrial revolution' in which product development will be carried out by collectives using media whose designs are then realised in robotised factories.

This example shows how reflection upon mediatisation by media-related pioneer communities leads to a range of possibilities in the shaping of unintended consequences; problems are dealt with through further improvements in media technology: *problems* of mediatisation leads to an *intensification* of mediatisation. These processes do not follow a unilinear 'logic', but are instead a complex of practices, complex technical realisation and unintended consequences that culminate in the transformation of mediatisation. Studying media-related pioneer communities can be a way of breaking this 'black box' open.

CONCLUSION: MEDIA-RELATED PIONEER COMMUNITIES AS A FIELD OF STUDY

My purpose in this paper was to draw attention to the phenomenon of media-related pioneer communities. Some aspects of these communities have already been subject to study, but so far they have not been treated by research in media and communication as collective actors in a process of reflexive mediatisation. This however enables us to examine pioneer communities as intermediaries between the development and the appropriation of new media technologies and grasp the current dynamics of mediatisation *without* assuming the existence of a fixed 'media logic'. There are at least three good reasons to believe that pioneer communities are an increasingly important topic for the study of media and communication.

1. We can treat transformations of practice, complex technical systems and the unintended consequences of both as components of an *imagined* collectivity. We do not need to presume that 'imagination' leads directly to the realisation of what has been imagined. Nonetheless, it makes sense to map this relationship since it allows us to see how designs for possible transformation become part of a critical reflex. Of course, we have to be careful that we do not treat these imaginary conditions as developed in pioneer communities uncritically. However, the way in which these imaginary states can influence the action of people is

exemplified by the quantified-self movement; their conceptions of self-measurement are rapidly gaining ground with a broad public. An approach to the study of mediatisation, and which considers itself to be 'critical' should seize on phenomena such as these at an early stage.

2. Detailed analysis of the processes through which communities form, and a sense of community is built, in media-related pioneer communities is important because these are potential 'laboratories' for what might become broadly-based phenomena. It is not only the presence of an 'imagined' process of media transformation that marks out pioneer communities; these communities seek to realise these imagined states *themselves*, however problematic the outcomes might be. The traces of this can be found in their labs, at the meetings, in their fairs, and so on. There is a dual impulse driving this on: through reflection on the transformation of mediatisation on the one hand, coupled with the progressive development of media technology as a response to the unintended consequences of mediatisation itself. This dual impulse in turn produces more complex technological systems that have their own contradictory unintended consequences. The study of pioneer communities can therefore lend insight into this reciprocal and self-supporting movement.

3. Media-related pioneer communities have a mission for social change that manifests itself in blogs and online forums, but also in the classical mass media. In this last of these there is a *journalistic construction* of the image of these communities that does not necessarily correspond to their internal processes. But since such reportage treats mediatised pioneer communities as viable communal constructs, this is itself a useful avenue of research. Public conceptions of media-related transformations are constantly dealt with in terms of media-related pioneer communities, whether these be maker, quantified-self or open data movements. By examining this discourse about pioneer communities we gain access to social reflection on the possibilities and limits of media-related transformations.

Taken together, these three points should exemplify the importance of differentiated and comparative study of media-related pioneer communities for the study of media and communication, which study itself seeks to critically investigate the transformation of culture and society through shifts in media and communication.

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