



Online Field Theory

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Abstract

Though massive amounts of digital trace data can be collected about *how* people and information connect online, the question of *why* they do so has been given less attention. This chapter addresses the spread of innovations and controversies by asking why some actors choose to connect to new issues while others do not? To answer this question, a new framework combining field theory with social network analysis (SNA) – *online field theory* – is proposed. Field theory suggests that actors in social spaces are unequal and strive to change this inequality, and SNA provides a framework for testing hypotheses emerging from field theory. The framework also draws some elements from actor-network theory (ANT), such as the incorporation of nonhuman actors, but – unlike ANT – empirically examining actor choices mandates the establishment of distinctions between the agency of different categories of actors. These different types of agency interact in mutually constitutive ways with field boundaries: while field structure is readily apparent in Web 1.0 organizational fields – such as the online environmental movement – the lack of information about actor identities in some Web 2.0 settings complicates field analysis. The chapter also examines how online field theory can provide insight into how Web 2.0 algorithmic governance, customization, and personalization are contributing to the emergence of online echo chambers. We define “filter bubbles” as online fields characterized by low contention and high homophily and outline how research into actor connection to innovation should approach them.

Keywords

Field theory · social movements · innovation · social network analysis · environmental communication

Introduction

For the longest while, social science lacked data about the phenomena under its purview. With the development of electronic media, it is being literally submerged by an avalanche of digital traces: it is now possible to observe in real-time aspects of collective life (socialities, interests, tastes, and opinions), as well as to measure large-scale social processes which were until recently impossible to quantify. When it comes to deciding what is the best heuristic for analyzing these digital traces, network approaches are often seen as an excellent fit. Indeed when online social relations began to be studied in earnest, Jackson (1997) argued that the idea of using “a methodology based on the metaphor of a network to examine a communication medium based on the metaphor of a web” would appear to be “so obvious that it threatens to be trivial.” There has been much research examining online sociality from a network perspective, whether social network analysis (Gruzd et al. 2011; Haythornthwaite 2007; Park and Thelwall 2008; Wellman et al. 2003), network science (Myers and Leskovec 2012; Onnela and Reed-Tsochas 2010), or actor-network theory (Marres and Moats 2015; Rogers et al. 2015). Both the

implementation of network methods and the insights gained have been far from trivial, and network approaches are now a mainstay setting for quantitative Internet research.

This chapter proposes online field theory as a new framework for studying how online actors engage with issues. The framework combines field theory with social network analysis, and we argue that this approach is more suitable for examining this type of online behavior compared with approaches deriving from Science and Technology Studies (STS) such as actor-network theory.

Social network analysis (SNA) and actor-network theory (ANT) have vastly different epistemological foundations: SNA presupposes the existence of the elements or building blocks of networks – nodes and ties – while ANT regards nodes and ties as uniquely contingent. ANT also takes issue with the idea of micro-interactions leading to the emergence of macro-social structures such as fields. ANT is not alone in its objection to analysis involving hypotheses derived from theory, especially when the hypotheses relate to the behavior of actors online, resulting in large-scale digital trace data: a similar argument has emerged from an entirely different disciplinary field, namely, computer science. It was popularized in a famous *Wired* article on “the end of theory”; given massive amounts of digital trace data can be collected about *how* people and information connect online, the question of *why* they do so becomes irrelevant: “Who knows why people do what they do? The point is they do it, and we can track and measure it with unprecedented fidelity. With enough data, the numbers speak for themselves” (Anderson 2008).

Do they really speak for themselves? Only if we believe that it is enough to predict behavior rather than understand evaluations, motivations, justifications, and hence causes. In contrast a field-theoretic perspective posits that human actors, unlike objects and signs, are reflexive: human actors create mental categorizations about the relative value of other humans, objects, and signs, and these categorizations may guide their actions. This perspective runs the risk of being seen as merely projecting ready-made categories onto hapless data. To safeguard against this charge, one must stay as close to the data as possible. The payoff to thinking in terms of fields and networks, rather than just networks, is significant: we demonstrate that the analytical properties of boundaries and agency can be clarified, and insights into social change and innovation gained. The “radical empiricism” (Marres and Moats 2015) of STS/ANT does not explain the failure of an actor to engage with an issue; nor does it account for the differences in actor experiences afforded by online governance institutions such as algorithms. This chapter uses the example of how ideas, causes, and risks emerge and circulate online to unpack the interplay of cultural and structural dynamics among online actors.

The online field theory framework agrees with STS/ANT scholars that attempts by actors to articulate issues, innovations, and controversies change these issues, innovations, and controversies; it concurs with the STS/ANT trope that nonhuman actors play a role in the diffusion of innovations and controversies. But it parts from the ANT paradigm in distinguishing levels of agency between types of actors and in suggesting that attributes such as age, culture, etc. account for how actors connect with other actors and with issues, innovations, and controversies.

We begin by providing a brief overview of field theory, including critiques. We then examine actor-network theory and social network analysis and suggest ways in which online field theory can draw on these network frameworks to account for actor responses to innovation. We show that the field framework has been applied to online settings and argue that it enables us to address questions ignored by network approaches. We present our analytical framework, articulated around the notions of agency and boundary. We illustrate this conceptual exploration by referring to examples of online activist and news fields. We argue that the evolution from the link economy (Web 1.0) to the like economy (Web 2.0) whereby algorithms customize content in response to user engagement with content changes the structure and dynamics of online fields. We finish by outlining some suggestions for further research into online fields.

Fields

Definition

Field theory initially emerged in the physical sciences through “various attempts to comprehend how one thing could affect another without some substantive medium” (Levi Martin and Gregg 2013: 40); examples include gravity, electricity, and magnetism. Gestalt psychologists adapted these notions in order to determine why seemingly independent elements are interdependent in ways that give rise to an overall set of dynamics (Kölher 1929). Fields thus emerge from the constant reciprocal adjustment of elements in relation to one another (Levi Martin and Gregg 2015: 43).

Social scientists added a utility-maximizing dimension. In anthropology, Turner (1974) defined fields as aggregations of relationships between actors competing for similar prizes or values. The most well-known social-scientific conceptualization of fields came from sociologist Pierre Bourdieu, who also focused on the economizing strategies of agents, as well as on the relationships of power that constitute and shape social fields. To this end, the notion of “capital” was expanded to include both material and nonmaterial phenomena, including cultural, economic, social, and symbolic resources (Bourdieu 1984). In Bourdieu’s sociology, society is differentiated into a number of semiautonomous fields, internally coherent microcosms, governed by their own “game rules,” yet with similar basic oppositions – between economic and cultural capital, for example – and general structures (Bourdieu 1984). These spaces are both *fields of force* (power is unequally distributed) and *fields of struggle*: people try to maintain or modify these power relationships. Fields can be distinguished according to the capital that is valued in them: capital is “heteronomous” (external to the field) or “autonomous” (unique to the field) so that fields differ according to their degrees of relative autonomy from each other and particularly from the dominant political and economic field (Bourdieu and Wacquant 1992).

After capital and field, Bourdieu's third conceptual tool is "habitus," open systems of dispositions which people acquire through moving through life and which are both structured by fields and contribute to constitute fields as meaningful worlds (Bourdieu and Wacquant 1992: 127). For Bourdieu fields are characterized by a dialectic of distinction which ensures the constant production of change as new actors enter and challenge the incumbents' ability to define the legitimate principles of the division of the field (Bourdieu 1984). Differences in behavior between challengers and incumbents are also a central axiom of social movement theory, starting with Gamson's (1975) analysis of the success or failure of social protest groups at achieving their goals.

The early weblog field was defined by the opposition between the masculine-open space of issue-blogs, focused on "quality," recognized as significant by the traditional media and dealing with serious issues such as politics and technology, on the one hand, and the feminine-closed space of journals, dealing with daily life, emotions, and friends and based on "intimacy" on the other. Issue-bloggers routinely derided the "vacuousness" and "futility" of journals (O'Neil 2005). In other words, the capacity to attract prestigious connections from other fields and to attribute worth was intertwined with gendered collective values. Indeed the importance of discourse characterizing the enforcement of behavioral norms (such as "netiquette," "flames," "newbies") on Usenet pointed to the exclusive and prescriptive character of hacker culture (Lawley 1994). The field of computer virus writers featured an elitist and strongly gendered conception of technical expertise (O'Neil 2006), a conception shared by free software programmers whose ethic of "coding for code's sake" also enabled them to profit from the interest in being perceived as disinterested (O'Neil 2009, 2014). Social hierarchies which are increasingly less tolerated offline in liberal democracies thus found a haven in some sectors of the Internet.

Critiques

A number of objections have been leveled at field theory in general and at Bourdieu's conception in particular. They can be summarized as follows: field theory is overly deterministic; it purports to exclusively unveil social domination; it is simply adding an unnecessary analytical level to reality. We address each of these critiques in turn.

Field Theory Is Deterministic

The charge of determinism detects a tautological relationship between the habitus of agents and the structures or fields within which they operate. However for Bourdieu "social agents will *actively* determine, on the basis of [...] socially and historically constituted categories of perception and appreciation, the situation that determines them" (Bourdieu and Wacquant 1992: 136). In other words determination exists, but so does individual autonomy; neither are pure and absolute.

A recent interpretation of the field framework emphasizes the notion of social skill, rather than that of habitus: drawing on social movement framing theory (Snow et al. 1986), Fligstein and McAdam (2012) define such skills as the way in which

actors are endowed with “a highly developed cognitive capacity for reading people and environments, framing lines of action, and mobilising people” (17). Social skills are central to Fligstein and McAdam’s concept of ‘strategic action fields’, constructed mesolevel social orders in which individual or collective actors interact with one another on the basis of shared understandings about the purposes of the field, relationships to others in the field (including who has power and why), and the rules governing legitimate action in the field.

Field Theory Purports to Unveil a Hidden Reality

The aim of Bourdieu’s sociology is to uncover forms of the social unconscious through which dominant social actors reproduce their domination. This critical approach implies that social actors are in a sense unaware of their exploitation, that they are dominated without realizing it. The point of view from which this unveiling social science speaks has therefore been criticized: sociologists are perceived to be elevated above ordinary social actors, solely capable of perceiving the hidden side of reality, in the shape of macro-social structures (Castoriadis 1986; Latour 2005). At the same time, asserting that, for example, marine biologists have accumulated years of training and experience which enable them to account for phenomena which untrained eyes cannot fathom seems uncontroversial. Why then should it be shocking to suggest that sociologists have been trained to decipher – let us say – complex statistical data?

There are two aspects to the critique of unveiling. The first has to do with critical sociologists’ perhaps overblown sense of their political role. This is because they intermingle their politics with their analytics, something which according to Bourdieu is forced on them by the revelatory potential of their research: “by uncovering the social mechanisms which ensure the maintenance of the established order and whose properly symbolic efficacy rests on the misrecognition of their logics and effects, *social science necessarily takes sides in political struggles*” (Bourdieu and Wacquant 1992: 51). Sociologists, being armed with the tools of critical science, have “a responsibility for playing a key role in modern political life” (Swartz 2003: 819, n.21). The objection to these quasi-messianic pretensions has merit – people are not “cultural dopes,” they are aware that exploitation and domination occur, and they try to challenge them – but it is often stretched to such an extent that any systematic discussion of social domination becomes impossible (Frayssé and O’Neil 2015).

Field Theory Adds an Unnecessary Analytical Level to Reality

A second aspect of the questioning of unveiling is epistemological. It suggests that the very act of superimposing an overarching construct such as “fields” over reality amounts to adding a layer of complexity above actors which is not only arbitrary but unnecessary: all that is needed is to trace associations created by the actions of the actors involved in a controversy. We address this critique in the next section.

Networks

Actor-Network Theory

The critique that field theory (or any theory that purports to detect regularities in society) adds an unnecessary and perhaps artificial macro-level structure above reality is a key point made by actor-network theory (ANT). It is worth quoting ANT's most famous proponent Bruno Latour at length: "Instead of trying to simulate and predict the social orders, we wish to acknowledge the limitations of the simulation approach for collective systems and prefer letting the agents produce a dynamic and collect the traces that their actions leave as they unfold so as to produce a rich data set. . ." (Latour et al. 2012: 605). The definition of what one is looking at, and of what one is looking for, is indeed fundamental. We outline in section "[A Theory of Online Fields](#)" how we define a field empirically but explain here why we diverge with ANT when it comes to boundaries, actors, and connections.

Boundaries

If we observe a sporting match and note that players are wearing similar clothes and footwear, acting in concert for a common purpose, and obeying similar rules, all of which are quite distinct than that of their spectators, then we can make a legitimate case that they constitute a distinct social space, however temporary; naturally they are connected to the family members, friends, and acquaintances watching them, to other players in other games, and so on, but it is safe to say that these ties will have limited bearing on the outcome of the game. We contend that a similar case can be made for online spaces (though their boundaries are more fluid than that of a sporting contest): participants are there for a reason, which has nothing to do with the researcher's construction of an object, or with a web surfer's online travels; no matter from which portal one enters, or the manner in which one interacts with other actors, the collective purpose of the participants remains their own.

The above quote from Latour and colleagues makes it clear that ANT is not designed nor intended for use in the analysis of social orders (simulation and prediction are tools of analysis). Johan Söderberg (2011) writes that ANT's *a priori* assumption about always working locally and moving outward results in "severe difficulties in explaining observations which are consistent over space and time." Suggesting that local networks can be stretched indefinitely to cover the global, macro-perspective, provided that the material traces are accounted for, is difficult to achieve in practice.

Actors

An oft-mentioned contribution of ANT is to incorporate nonhuman actors into the network of connections and translations (Latour 2005). To return to the sports field, for example, there is no doubt that the quality of the pitch and ball play a significant role, or that the game would be vastly different without the referee's whistle or the goal posts. Yet there is a fundamental difference in terms of agency between nonhuman and human actors: the whistle cannot blow itself; the ball cannot score

a goal of its own volition. Both are dependent on human intervention. Similarly online there is a need to distinguish between actors who can autonomously make connections (such as people and, arguably, “bots”) and those who, though enabling important affordances in the diffusion of activism and controversies, rely on others to connect (to) them, such as Twitter hashtags, for example. It is also misguided to treat the algorithms that orient interactions across networks as “just another actor”: non-algorithmic actors have no choice as to how algorithms affect them, so it makes better sense to define algorithms such as Google’s PageRank as governance institutions whose influence stretches over the whole field.

Connections

Not all connections are equal. It is far easier to create connections in Web 2.0 (e.g., by retweeting or liking a post) than on Web 1.0, where hyperlinks have to be written into website link pages. Connections should accordingly be interpreted differently. Assuming that connections are unproblematic also overlooks a key fact, which is that actors may choose not to connect to one another. In the online environment, where making connections is at once costless and public, the absence of connections is highly significant (Ackland and O’Neil 2011).

Social Network Analysis

In recent years the availability of enormous amounts of socially generated digital trace data (sometimes known as “big data”) has led physical and computer scientists to adopt and extend network-theoretic approaches for studying social behavior. A major focus of network science has been the development of models of “social contagion,” in which information spreads smoothly and continuously across nodes (e.g., Myers and Leskovec 2012; Onnela and Reed-Tsochas 2010). However, while much is known about how content spreads on the Internet, less attention has been paid to online economies of worth: why is item x deemed interesting or valuable by people, whereas item y is found to be the opposite? This is all the more important when it comes to activism or political news, as successive individual decisions to connect with specific issues may have far-reaching societal consequences. In our view, the contagion framework leaves a number of important questions unanswered: do campaigns and issues unfold uniformly, or do they follow patterns of development? How does the discursive work of people involved in creating or spreading issues operate? What attributes of actors make them trusted sources of information? If it is agreed that the characteristics of an innovation, of potential adopters, and of the environment affect diffusion (Wejnert 2002), alternative understandings of how information spreads are required.

Though actors can be labeled to reflect individual cultural attributes, network approaches by default or on their own do not account for reflexivity, such as evolving group preferences. What is needed is a field theory combined with network approaches: the online field framework can explain how patterns of relations between networked actors are organized in collectively significant ways.

A Theory of Online Fields

With the availability of digital data, there is a lot of “noise” to sort through, so it is important to use both qualitative and quantitative approaches, both discourse analysis and network analysis. Chateauraynaud (2014) attempts to resolve the epistemic contradiction between network mapping and the analysis of arguments located close to the discursive and dialogic activity of actors by referring to “discursive regimes” which emerge with controversies, are organized around “semantic knots,” and operate through a series of oppositions; further, he groups together narrative and argumentative variants which have a “common look.”

Online fields resemble these “regimes” inasmuch as they are constellations of issues and actors who both coordinate and compete over a collective purpose, that is to say the collective understanding of what matters. In field theory social relations are made of both social structures, in other words objective differential possession of capital (in the academic field ‘everyone knows’ that university A is more well-endowed and prestigious than university B) and social interactions (researchers from those two institutions may decide to collaborate and write papers together). Objective relations of power ‘exist even if there is no interaction and this fact escapes the attention of symbolic interactionists or social network analysts’ (de Nooy 2003, p. 317). Hence an actor’s sudden entry or withdrawal might substantially change a network’s metrics, and hence its shape; whereas the boundaries of a field would not be affected.

Agency

Contrary to ANT, the online field framework begins with the recognition that there are three kinds of entities with varying levels of agency present: primary actors, secondary actors, and algorithms. The first type of entity represents individuals, groups, or organizations. We refer to such entities collectively as “primary actors,” capable of making connections among themselves in social space, as well as connections to the second type of entity. A primary actor on a field is therefore any entity that participates in the construction of the field by facilitating aggregations and connections, by making judgments, and by attempting to influence who or what is connected to the field, for example via the adoption of issues.

We expand further on our definition of primary actors below when we discuss two examples of online fields: Web 1.0 (www hyperlink networks) and Web 2.0 (Twitter). Web 1.0 fields are homogenous, comprising only social movement organizations (SMOs), while Web 2.0 (Twitter) fields are heterogeneous, comprising organizations and individuals (publics) (Table 1).

The second type of node is a textual representation of the topics or issues that the actors are engaging in, or concerned about – we refer to these nodes collectively as “secondary actors.” Issues exist in semantic space, and the connections between issues are made by actors, via their use of text content in Web 1.0 or Web 2.0 environments. While a hashtag’s socio-technical affordances can contribute to

Table 1 Web 1.0 and 2.0 online fields

	Online social movements Web 1.0 (WWW hyperlink networks)	Networked publics Web 2.0 (Twitter)
Affiliation	Long-term commitment of members to a cause	Transient connections of organizations and individuals
Composition (primary actors)	Homogeneous – websites of social movement organizations	Heterogeneous – Twitter accounts for organizations, individuals
Composition (secondary actors)	Website text content (e.g., meta keywords)	Hashtags
Frames	Organizational – fixed collective action frames	Personalized – actors can create or remix frames
Capital (in social space)	Links are few, meaningful, and durable (e.g., hyperlinks on “links page”)	Endorsements are numerous, trivial, and soon superseded (e.g., “mention” or “retweet”)
Governance (legal)	Distant governing body. ICANN, which regulates Internet protocols and standards, does not intervene to regulate website content	Active governing body. Platform owners regulate aspects of the field, i.e., Twitter Corp do not prevent people from using particular hashtags unless in violation of language policies
Governance (algorithmic)	Search algorithms have limited impact on field content	Feed algorithms may have profound impact on what information is made available

defining an online activist field on Twitter, a hashtag does not have agency in that it cannot choose whether to make a connection with another actor or not.

There are two main actions available to primary actors in an online activist field. Primary actors can make connections to other primary actors in social space by hyperlinking in Web 1.0 or replying/mentioning/retweeting in Twitter; we referred to possible motivations above (see also Ackland and O’Neil 2011). Second, primary actors can make decisions to connect to secondary actors (issues) by using particular keywords on websites and in tweets, and it is on this action that we focus here.

It is necessary to define a special type of issue, *frames*, which are used to condense a complex social topic (e.g., an emergent social or environmental risk) into an easily communicable discursive form. Our understanding of frames comes from the social movement literature, where they are defined as action-oriented sets of beliefs and meanings which justify the activities of social movement organizations (Snow et al. 1986). In our model, frames are particular types of issues that are distinguished by their emergent nature and innovation. Frames are issues that are developed and adopted by primary actors in response to external events or as a way of changing the existing structure of a field. Frames therefore do not define a field, and they are unlikely to be used by opposing groups or factions within a field, though over time a successful frame could come to define a field (by that stage, in our model, it would no longer be called a frame).

As mentioned previously, the presence of a third type of entity – algorithms – clearly illustrates the wrongness of treating all actors as equal: algorithms do not engage in interactions with other entities; they *govern* them. Google’s PageRank plays a key role in orienting actors between websites. However actors can navigate the World Wide Web without PageRank, and the algorithm’s impact is limited to search results. In contrast Twitter users have no way of telling to what extent the content they view on their newsfeed, or the speed at which that content is delivered, has been managed by Twitter’s algorithm.

Boundaries

ANT’s concern not to unduly project overarching structures onto local interactions is commendable. However it is the interplay of the different types of agency outlined above which leads to the emergence of a common understanding of what matters, of what is actually at stake in the game (scoring a goal, organizing a protest, making a risk issue visible). In some cases the socio-technical affordances of the Internet mean actors perform the boundary themselves: the use of certain hashtags effectively circumscribes online fields.

The theory of online fields was developed in the context of research into the use of networked media by activists. Individuals and organizations in pursuit of social change have embraced the distributed nature of the Internet, where actors can freely create connections to others, disseminate information, and coordinate action. By enabling values such as diversity, decentralization, informality, and grassroots democracy rather than centralization and hierarchy, information and communication technologies such as the Internet are said to fit perfectly the ideological and organizational needs of social movements (Castells 2004). Scholars originally focused on online social movements and interest groups striving to enact or resist social change through protests and campaigns (see Garrido and Halavais 2003; van Aelst and Walgrave 2004; Shumate and Dewitt 2008; Ackland and O’Neil 2011). Since the wave of protests of 2011, authors have examined how ICT enabled the amplification and spread of offline grassroots protests (Castells 2012; Gerbaudo 2016; Juris 2012). Researchers employing a quantitative perspective typically adopt a network science approach, whereby the properties of nodes, connections, and networks themselves are used to explain why and how protest spreads through society (González-Bailón 2014).

This research deals with very general notions such as “the Internet,” “social media,” or “Twitter,” obviating the fact that not only are there “online spaces which develop distinctive and well-ordered cultures” (Hine 2015: 38) but that these online spaces are frequently embedded in offline locales. At some point, actors will cease connecting to a hashtag. Other network connections will continue, and other fields may then appear.

Field Structure

The internal structures of online fields, like their boundaries, derive from the constant adjustments made by actors in relation to each other. Fields are conventionally represented by two axes and actors positioned along these according to the amount of “capital” they possess. In an online field, a clear distinction can be made between actors who have more resources and prestige and connect to many issues (at the top of the vertical axis which measures the “global volume” of capital) and those who do not. The horizontal axis represents common agreements over what matters, in other words the “structure” of capital. For example, in the online environmental field, it is possible to distinguish actors and issues that are local from those which are transnational. The literature on activist fields (Ackland and O'Neil 2011; O'Neil and Ackland 2018) and on journalistic fields (Craft et al. 2016; English 2016) adopts the classic Bourdieusian conceptualization of fields as dominated by powerful interests. These precedents can operate as a useful heuristic which can be built on to conceive, for example, the online journalistic field as structured around the actors' economic, cultural, and social capital (vertical axis) and the actors' principles of journalistic practice – public service, objectivity, autonomy, immediacy, and ethics – in gathering and reporting news (horizontal axis).

Once the agency, boundary and structure of the field are outlined, social network analysis can map relations between actors. The distinguishing feature of Internet sociality is that online interactions are extraordinarily more public than their offline counterparts. On the Internet there are no other means of expressing recognition and affiliation than through visible connections such as hyperlinks (in Web 1.0) and retweets, follows, and @replies (in Web 2.0). Online social relations are simplified versions of offline social relations, with far more basic communication options.

Applied Research into Online Fields: Web 1.0

Initial research into online fields by the authors sought to test out some core tenets of field theory. While social network analysis quantitatively measures the behavior of actors in networks, it does not provide hypotheses as to why this behavior occurs. In contrast field theory allows the formulation of hypotheses that can be tested using social network analysis. One such hypothesis pertains to a central aspect of behavior on fields: why do actors connect with issues? In addition to material connections, fields comprise actors' mental representation of who and what matters, as well as “principles” or “rules” guiding the behavior of actors in fields. Field theory thus holds that the strategies of actors, such as their likelihood of embracing or rejecting innovations, derive in large part from their status as challengers or incumbents in fields. This quasi-orthodox principle is assumed by field theorists to be incontrovertibly correct, rather than empirically validated (Bourdieu 1985; Fligstein 2013).

Primary actors on online activist fields can adopt three different courses of action in the context of frames: innovate (i.e., create a frame or be an early adopter), co-opt an existing frame, or do nothing. The dynamics of adoption of a frame are illustrated

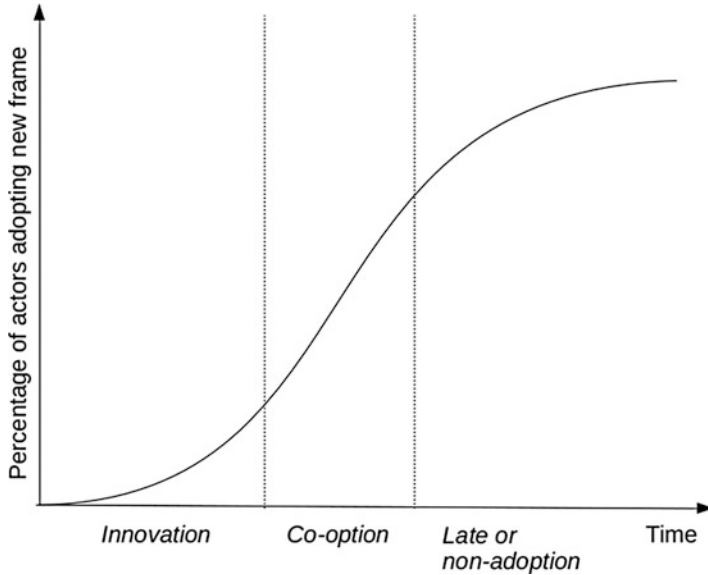


Fig. 1 Diffusion curves

using the so-called S-curve of innovation in Fig. 1. Primary actors who act as frame creators or early adopters can be referred to as “innovators,” while those who connect to a frame during the period when there is the biggest increase in awareness of the issue are labeled “co-opters.” Finally, those primary actors which are late to connect to the frame (or never connect to it) are the “laggards.”

Competition between primary actors in a field means that dominated challengers must struggle for space, and we propose that a key strategy used by actors attempting to gain influence in an activist field is frame innovation. Taking this argument to its logical conclusion leads to the following hypothesis: the lesser the influence of a primary actor in an online activist field, the greater the probability of the actor innovating by connecting to an emergent online frame. If the main strategy available to challengers is the creation of innovative claims and campaigns, how do dominant primary actors in the online activist fields address emergent issues? We contend that dominants in online activist fields will employ conservation strategies to maintain their influence and protect their issues, and hence will tend to connect less to new issues, compared with challengers.

Agency

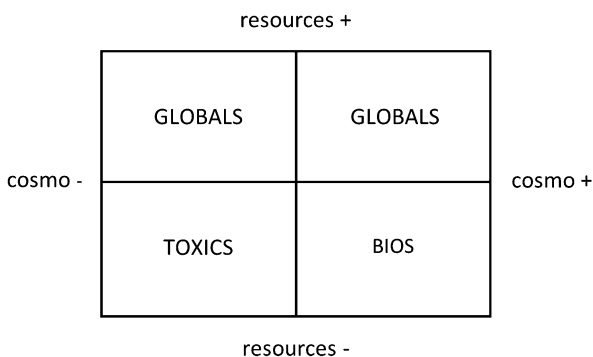
We can distinguish two types of text extracted from websites. *Field keywords* are expected to appear on any website in this field (e.g., the word “environment”) – their presence can in fact be used as a condition or test of whether an actor is a participant

in this particular field. *Frame keywords* are only likely to be used by an actor that is connecting to a specific issue or frame on the environmental activist field. In our previous work (Ackland and O’Neil 2011), we were not so stringent in using the presence of particular field keywords as a condition for including a website as an actor on the environmental activist field.

The collective purpose on which all environmental activists agree is the need to raise public awareness of environmental issues. The actors in the field were identified using techniques advocated by Rogers and Zelman (2002) for researching “issue networks,” including locating websites via querying search engines with relevant keywords and following hyperlinks from relevant websites (a form of snowball sampling). In order to establish that ‘objective relations of power’ have an existence outside the mind of researchers, it is necessary that the unequal distribution of capital be incontrovertible. Here we suggest that in the environmental field ‘everyone knows’ that organisations such as World Wildlife Fund are better endowed and more able to form connections to multiple campaigns than (for example) the Silicon Valley Toxics Coalition. We also contend that the degree of variation in the material proximity of these two organizations to their issue(s) is widely known and understood. We therefore propose that the online environmental field is structured by two main dimensions: organisational size (SMOs can range from small groups of unpaid volunteers to massive corporate-like organisations) and organisational focus (from local issues to transnational concerns). In field-theoretic terms, the first dimension corresponds to ‘economic capital’ and the second to ‘capital specific to the field’ or ‘cosmopolitan capital’.

In their study of the Australian environmental movement, Crook and Pakulski (2007) distinguish ‘green’ (conservation-oriented) from ‘brown’ (pollution and waste-oriented) environmental concerns. Building on this distinction, Fig. 2 positions three main SMO types on the online environmental field according to the specific combination of their organisational size and focus. Dominant actors, richly endowed in economic capital, are in the top half: such ‘Globals’ are complex organisations who focus on a large number of issues ranging from the local to the transnational including climate change, forest and wildlife preservation, nuclear weapons, and sustainable trade. Economically dominated actors are to be found in

Fig. 2 The online environmental field



the lower parts of the field quadrant. ‘Toxics’ such as the Silicon Valley Toxics Coalition are small organisations with a local focus on few issues including pollutants and environmental justice, whilst ‘Bios’ are small organisations with a transnational focus on few issues including genetic engineering, organic farming and patenting.

Boundary: Environmental Risk

In an environmental social movement, challengers connect to frames relating to the emergence of new environmental risks. Industrial development generates global risks which are incalculable, resulting in the ‘irrepressible ubiquity of radical uncertainty in the modern world’. Risks are based on “causal interpretations,” only existing initially in terms of what is known about them, and thus particularly open to “social definition and construction” (Beck 1992: 22). Though Beck rejects class as an explanatory variable, he argues that “some people have a greater capacity to define risk than others”. It is precisely this inequality which environmental SMOs seek to contradict by making heretofore imperceptible risks visible. A core stake among actors is the definition of which environmental risk (whether global warming, deforestation, biotechnology, pollutants, etc.) is the most significant. Exogenous shocks or disruptive events, such as the development of a new technology, thereby represent an opportunity for challengers to gain influence by developing new frames. The mapping of the hyperlink network confirmed the field structure: Globals were more dominant in terms of network centrality, and there was a clear division between the two less influential groups, who shared similar discourse but did not link to each other (Ackland and O’Neil 2011).

Analysis

We posit that a primary actor’s field location in an online social movement will be a key determinant of the probability that this actor participates in early frame development arising from a disruptive event, such as a new technology or a change in legislation. Using the terminology introduced in Fig. 1 above, we contend that challengers in dominated sectors of the field are more likely to be innovators, compared with dominants, when it comes to responding to emergent risk issues. In O’Neil and Ackland (2018), we investigate our hypothesis using hyperlink network and website content data from 161 environmental activist websites collected in 2006, and we also collect biennial data for the period 2002–2012 for a subset of these sites.

We focus on actors’ responses to nanoscience and technology (NST), the science of technology development at the atomic level, which is increasingly being used in a range of industries. We found that there was significant uptake in the online environmental field of NST as an issue of concern, with the growth of adoption reaching its apex in 2006. We found statistical support for our contention that challengers are more likely to engage with the emergent NST risk issue. Actors

engaged in issues relating to biotechnology – who were structurally in weaker positions – displayed a high level of adoption of the nanotechnology risk issue (as evidenced by the presence of terms relating to nanotechnology on participant websites). Thematically, there are striking similarities between the portrayal of biotechnology as likely to cause irreversible and unpredictable damage, the resistance to becoming dependent on multinational companies, and the calls for a moratorium which anti-biotechnology activists have historically put forward (Levidow 2000) on the one hand and activist discourse on nanoscience and technology (e.g., ETC 2003) on the other.

Challengers innovate, but *contra* orthodox field theory, instead of resisting change, dominant actors are behaving as co-opters, located in the middle section of the diffusion S-curve in Fig. 1, rather than in the last section. Contrary to the offline realm, it is not financially or symbolically costly for a social movement actor to adopt a new online frame: this may simply involve posting a relevant article on the organization's website, for example. Relatedly, the cost of endorsing or promoting a new frame that does not prove to be successful or ultimately in the interest of the organization is not going to be so great so as to act as a disincentive to participation. Incumbents in online fields are more likely to experiment than their offline counterparts.

A Web 2.0 Activist Network, but Not a Field

The rise of the Writeable Web or like economy whereby anyone with Internet access can not only produce media but evaluate or “like” online content has led to the rise of new forms of aggregation such as networked publics, which pose unique challenges to field theory.

Agency

Whereas classic theories of collective action emphasize the role of social movement organizations or SMOs (McAdam et al. 1996), personalized action frames shift the focus away from the SMO and onto networked individuals, who use frames to create or join loose coalitions of networked actors or “networked publics” (Ito 2008; boyd 2010).

Our second case study is Web 2.0 online activism, and we focus on the medium of Twitter. Primary actors (individuals, organizations) connect to one another in social space via retweets, @mentions, @replies, and following relationships. Primary actors also promote issues via the use of hashtags and, in doing so, create ties between these issues in semantic space (two hashtags are connected in semantic space if a Twitter user features both hashtags in a tweet).

Hashtags enable ad hoc connections between people, resulting in what Bruns and Burgess (2011) call “ad hoc publics.” Yang et al. (2012) argue that Twitter hashtags do not only operate as bookmarks helping to categorize content: hashtags “serve as

both a tag of content and a symbol of membership of a community” (270) and Twitter users are aware of this dual function, as evidenced by comparing Twitter to other Web 2.0 sites: “the network density of hashtag communities is around a thousand times larger [on Twitter] than the network density among users, using the same tag(s) in Flickr, LiveJournal, or YouTube” (Yang et al. 2012: 264).

Boundary

Researchers stress the importance of physical space for the wave of protests which reclaimed urban squares, places, and parks since 2011 (Gerbaudo 2012; Juris 2012). Time also creates a boundary, as can be seen from the frequent use of dates as rallying cries by Web 2.0 activists. On a practical level, this enables simultaneous mobilizations in multiple locations, while symbolically it serves to signify a momentous beginning or milestone – see 15-M (15 May) in Spain or #Oct15 in the United States. October 15, 2011, was a global day of support for the Occupy Wall Street (OWS) occupation which involved 1,500 protests in 82 countries (Juris 2012). The collective purpose here was the defense of alternatives and resistance to austerity policies.

Provided an assumption is made that a Twitter activist network can operate as a field (we interrogate this assumption below), then it is possible to use OWS-related hashtags (#ows, #occupywallstreet) to define the boundaries of the OWS field on Twitter, with any actor who tweeted using either of these hashtags during the period being considered to be a part of the field. Analogously to the Web 1.0 case above, it is therefore possible to distinguish *field hashtags* which opponents on the field are equally likely to use from *frame hashtags* which are only likely to be used by a networked public that is pushing a particular frame. In the OWS context, the field hashtags include #ows and #occupywallstreet, while frame hashtags might be used by OWS actors who are campaigning on a particular issue or who are attempting to shape the movement in a particular way and who may face opposition within OWS. In the Australian political context, for example, we regard #auspol as a field hashtag since primary actors on the Australian political field from both the “right” and “left” side of politics use #auspol, while #marriageequality is an example of a frame hashtag, as it is unlikely that opponents of #marriageequality would use this frame.

Analysis

At this stage of analysis, it becomes clear that the choice of approach for defining the boundary of the Web 2.0 activist field, and hence which actors are part of the field, is crucial. If we use a field hashtag (or set of field hashtags) to circumscribe a networked public such as Twitter activists, the only information about actors accessible through ethical digital trace data analysis is that which is made public by these actors: however in many cases, biographical information is either useless (humorous or irrelevant) or simply absent. In such a situation, can we really speak of a “field”

when we ignore who the participants are? Without reliable information, we cannot draw a field, and are therefore left with a network, but no field.

Ackland et al. (2018a) used field hashtags (#ows, #occupywallstreet) to demarcate the space and studied the dynamics of adoption of a particular hashtag, #S17, which emerged on the OWS field around March 5, 2012. The hashtag refers to September 17, the first anniversary of the OWS movement, and was meant to indicate that OWS was not a fleeting protest or fad, as evidenced by the following tweet: "One year young, and just getting started. #OWS #S17." Though #S17 was primarily used by recent entrants, the lack of reliable information about who had status and why meant it was difficult to conceive of this online network as an online field; #S17 could not be considered a frame hashtag, and statistical tests of the adoption of the hashtag were unlikely to be testing the primary field-theoretic hypothesis that dominated actors are more likely to adopt an emergent frame hashtag.

In summary, the question of whether an online network can be analyzed as an online field hinges around the identity of the actors in the network. In the case of the Web 1.0 environmental organizational field, the identity of the actors was evident from the websites, so the relative status of actors on the field could be determined. In contrast, with the example of the Twitter activist network, the identity of the actors was uncertain; the relative status of actors was unknowable; hence it could not be reasonably determined to what extent online field dynamics were at play. In networked publics individuals can create multiple accounts, or not identify themselves, at no cost. In contrast an environmental organizational organization (or any other institutional actor) who did the same would face significant reputational costs.

A Web 2.0 News Field as a Filter Bubble

The limitations in the abovementioned study show that when digital traces are a primary source of data, (semi-)institutional settings, where the status of organizations is knowable, may be more suited to field analysis. The previous section showed that the study of networked publics as fields (e.g., OWS on Twitter) is problematic because these publics are by definition heterogeneous. But this does not preclude the application of field theory to the study of Web 2.0, in the case of the official Twitter handles of social movement organizations or of individuals working in a particular professional field, such as journalism.

Agency

The evolution from the "link economy" to the "like economy" has deeply modified the online landscape, and it is vital that an approach for studying online fields be able to account for the role of algorithmic customization and personalization which allow individual actors to collectively shape fields. The debate around "filter bubbles"

(Pariser 2011) is not new. Indeed the loss of a common political discourse resulting from a fragmenting of the online population into narrowly focused groups of individuals solely exposed to information confirming previously held opinions and biases has been previously referred to as “echo chambers” (Sunstein 2001) and “cyberbalkanization” (Van Alstyne and Brynjolfsson 2005). However, while the concepts of filter bubbles and echo chambers are widespread, there is scant empirical evidence for their existence and impact with some researchers simply assuming that they exist and that something needs to be done about them.

By explicitly considering how people – in particular, journalists working in the news media field – make decisions about whether and how to engage with news, the online field framework can contribute to understanding how filter bubbles, when operating in influential sectors of society such as the journalistic field, can be detrimental to the plural public discourse that is essential to democracy.

Boundary

The discussion above has highlighted the fact that boundaries are key to establishing whether a set of online actors in fact constitute a field, and this is particularly important in Web 2.0 environments which facilitate the formation of networked publics. A field-theoretic examination of journalist behavior on social media such as Twitter should therefore start with a population frame of journalists who are active on Twitter. This type of study should be contrasted with a related study by Ackland et al. (2018b) which sought to examine the role of national culture (Australia, Korea) and political affiliation (right, left) in engagement with news on Twitter. In the latter study, the Twitter data were collected by first identifying news stories that had been tweeted by a representative sample of news brands on a representative sample of days and then finding all of the Twitter actors who engaged with these news stories by retweeting them. In this study the boundary is such that the dataset includes journalists as well as anonymous or pseudonymous members of the general public: though there is uncertainty, the presence of institutional actors whose relative status is known means it could more reasonably be analysed in field-theoretic terms.

Analysis

A field-theoretic conceptualization of journalism will allow an assessment of whether certain categories of actors (incumbents or challengers, members of social niches or isolates) and dominated or dominant sectors are more or less likely to take part in the formation of filter bubbles.

The field-theoretic approach can help address the impact of political polarization on the spread of controversies, campaigns, and innovations. Here we can draw inspiration from Haussler et al.’s (2017) analysis of levels of contentiousness in hyperlink networks discussing climate change in the United States and Germany.

We can tell whether a field is contentious or not by measuring how much one issue dominates. High-contentious fields have opposing viewpoints of equal strength, whereas in low-contentious fields hegemonic actors monopolize public discourse. The degree of partisanship (how opposing viewpoints are balanced) depends on the field: there is more homophily in low-contention fields as dominants feel they can ignore challengers (Haussler et al. 2017).

According to Koopmans (2004), high-contentious settings exhibit greater political conflict than low-contentious ones. High-contentious settings demonstrate not more activity, but more reciprocal interaction as increasing amounts of communication are mobilized for contestation. In order to diminish conflicts resulting from interaction with dissenters, actors tend to engage in homophilic interactions (Monge and Contractor 2003: 223–239). In this sense filter bubbles are a specific kind of field characterized by very low contention and very high homophily. Future research could engage with the impact of filter bubbles on the trajectory of issues: for example, are issues accelerated centrifugally or slowed down when they hit a bubble?

Conclusion

Normative critiques of network approaches hold that focusing only on existing network properties prevents social network analysis, just like its more theoretically inclined cousin, actor-network theory, from accounting for the following question: why is it only certain types, or categories, or classes, of actors, often the same, which accumulate power? Network-theoretic methodologies do not consider the fairness of the distribution of resources between nodes (O'Neil 2011). In this paper, the analytical critique of network-theoretic approaches does not reject such approaches for normative reasons: on the contrary, we build on their epistemological and methodological insights. Nonetheless, we have argued that fields enable a fuller understanding of the motivations and actions of actors than networks. Examining strategic decisions by actors in different cultural and social settings cannot be done with actor-network theory (which refuses to consider actor decisions), so it needs to refer to fields, verified by social network analysis.

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