

SOCIAL DYNAMICS IN ONLINE CULTURAL FIELDS

Les Dynamiques Sociales Dans Les Champs Culturelles En Ligne

Research-in-Progress

Manuel Arriaga

New York University
Stern School of Business
44 W 4th St.
IOMS Department
New York, NY 10012
marriaga@stern.nyu.edu

Natalia Levina

New York University
Stern School of Business
44 W 4th St.
IOMS Department
New York, NY 10012
nlevina@stern.nyu.edu

Abstract

In spite of a long literature on online communities and electronic networks, little theoretical work has been done on understanding a recent online phenomenon: "user-generated content" (UGC) platforms. This paper proposes an analytical lens for the study of social dynamics on UGC platforms. Drawing on Bourdieu's concepts of field and capital, we introduce the notion of online cultural field and investigate which characteristics of agents and their contribution behavior produce status distinctions in these fields. These characteristics are then placed in a framework which attempts to address how capital is produced, reproduced and transformed in online cultural fields and how these processes help us understand the evolution of these fields. We briefly review how we will follow this theoretical model with an empirical investigation.

Keywords: Internet, online communities, social informatics, social science, Web 2.0

Résumé

Nous proposons une perspective analytique pour l'étude des sites web avec du "user-generated content". L'oeuvre de Pierre Bourdieu est utilisé comme la fondation théorique de notre travail. On analyse la production, dissemination et evaluation du contenu par des utilisateurs. La notion de "champ culturel en ligne" est introduite et on identifie les caractéristiques des utilisateurs et de ses contributions associées a la accumulation de prestige.

1. Introduction

User-generated content (UGC) has been the focus of considerable attention on the part of the media and commentators over the recent years. Since 2004, a series of Internet platforms have emerged which allow users to easily upload, organize, share and access digital content. Later considered paradigmatic cases of the so-called "web 2.0", websites such as Flickr, Del.icio.us, Youtube, Blogger and MySpace thus became vast repositories of photographs, bookmarks, videos, blog entries and personal profiles contributed by their users. The expression "user-generated content" reflects the most salient feature of these websites: that by and large their content is being produced not by paid professionals hired for that purpose, but instead their users are simultaneously playing the roles of producers as well as consumers of the content on the site.

However, besides contributing resources users also perform another fundamental task on these platforms: they publicly evaluate the contributions made by their peers. Thus, these platforms are the site of *social games* (Bourdieu and Wacquant 1992: 25) dealing with the simultaneous generation, consumption, and valuation of digital content.

Prominent among this new generation of platforms are those known as "social tagging websites". Social tagging websites are online platforms on which users assign nearly free-text¹ labels (commonly referred to as "tags") to resources stored on the platform. These tags are, by default, viewable by all users on the platform and can be used by anyone both for organizing content as well as for exploring the repository. The social, or collaborative, aspect of tagging on these websites arises from two facts. First, tags facilitate users' access to the platform and thus make it a social resource. Second, when considering the emergence of aggregate-level patterns of tagging and its use on such sites, one can view tagging as a group-level phenomenon (Golder and Huberman 2006). Our empirical investigation focuses on a social tagging platform.

In this paper we develop the concept of online cultural field as an analytical lens for studying the social processes on UGC platforms in general, and social tagging platforms in particular. An online cultural field is a group of individuals who use a common IT platform, share a cultural affinity and who, by engaging in the production, dissemination and valuation of user-generated content on this platform, have an influence on the trajectory of other individuals in that field.

Fundamental to understanding this project is to notice that online cultural fields are conceptually distinct from online communities. In this paper we use the term "online community" to refer to "a large collectivity of voluntary members whose primary goal is member and collective welfare, whose members share a common interest, experience or conviction and positive regard for other members, and who interact with one another and contribute to the collectivity primarily over the Net" (Sproull and Arriaga 2007). While this is a strong definition, most definitions used in the literature emphasize that online communities are based on a computer-mediated *interaction* among its members, often adding that such interaction is around a common purpose or interest (cf. Porter 2004). The definition of an online cultural field drops the requirement for direct interaction among its members; it is, therefore, a broader concept. An online community will typically be an online cultural field (since its members will share a cultural affinity and engage in the production, dissemination and – even if only implicitly – valuation of the contributions of others). However, the reverse will often not be the case: e.g., a group of individuals who upload and view pictures dealing with a particular subject on Flickr may never interact with each other directly². Relaxing the requirement for member interaction, the online cultural field lens brings with it an emphasis on the study of a phenomenon that is as much social as it is economic in its nature: it focuses on the contribution, consumption and valuation behaviors that do not easily fit within the traditional social-psychological framework of behavior and attitudes in a group setting.

¹"Free-text" refers to these labels not being selected from a controlled vocabulary (pre-)defined by the platform but rather typed by the user. We call these labels nearly free-text because all platforms impose some restrictions on the format of a tag – most commonly, a tag must be a single word not containing any white-space and must not exceed a given character length.

²We assume that viewing somebody else's posting does not constitute an interaction.

The notion of online cultural field can thus be seen as complementing that of online community in two significant ways: (i) theorizing about this notion can cover a large range of online groups (rather than just online communities); and (ii) it allows new questions to be asked about online communities which go beyond those supported by the social-psychological framework commonly used in their study.

Employing the concept of online cultural field and drawing on the sociological theory advanced by Bourdieu allows us to understand the question of how online cultural fields evolve, namely, the social dynamics that lead to changing patterns of participation and contribution. Specifically, we will undertake the development of an integrative perspective that incorporates characteristics of users, the content they produce, and the visible markers of distinction assigned to the users and their contributions in a single framework. Previous work on collaborative tagging, social networking websites and blogging adopted a variety of theoretical (and often *atheoretical*) perspectives which hindered the development of a broader, more general perspective on the production and valuation of UGC. A key motivation for the current work is to address this gap in the literature and facilitate the development of a research stream which addresses the common elements across the majority of UGC platforms rather than narrowly focusing on a specific platform and its particularities.

This paper is structured as follows. In Section 2 we review the literatures on two types of user-generated content (collaborative tagging/bookmarking and social networking websites) and on roles and contribution behavior in online communities. Section 3 develops the concept of online cultural field with reference to the original concept of fields of practice as developed by Bourdieu. Next, in Section 4 we describe the general approach which will be used in our empirical work. Section 5 concludes with our expected contributions.

2. Literature Review

Given that our empirical work will be conducted on a dataset from a large collaborative tagging platform, we will begin by reviewing prior work on social tagging. We then consider the literature on another major type of user-generated content platforms, namely, social bookmarking websites, and conclude with a very brief review of the literature on online communities.

Social tagging websites such as “Del.icio.us” provide a technological platform for users to share bookmarks and assign tags to those bookmarks. Five central research streams are discernible in the literature on social tagging (Cattuto 2006, Golder and Huberman 2006, Guy and Tonkin 2006, Marlow et al 2006, Mathes 2004, Paolillo 2008, Sen et al 2006, Yew et al 2006). The first stream focuses on the advantages and limitations of social bookmarking as an information retrieval, or “resource discovery”, tool. The second stream develops taxonomies of social tagging systems based on their features and how the latter might affect user behavior. The third stream studies the motivation and the intended goals of users. The fourth stream tries to understand individual-level vocabulary and its development. Finally, the fifth stream focuses on the emergence of patterns in aggregate tagging and bookmarking behaviors, and is the most relevant to the current undertaking. Within this research stream, Paolillo (2008) has analyzed network ties and tag usage among users of Youtube, finding that greater network linkage tends to occur within clusters of users who employ similar (or semantically related) tags. Most of the prior work on the topic, however, considers the static aspects of UGC platforms.

The literature on social networking websites such as Facebook.com has overwhelmingly focused on issues of identity and impression management, with some attention also having been paid to the analysis of the network structure of such sites. Among the latter, some researchers have investigated the relation between profile content and network ties detecting homophilic behavior and a positive correlation between users providing certain “verifiable” profile elements (e.g., high school or college attended) and their number of “friends”. None of the work we came across adopted a dynamic perspective of social phenomena on these platforms.

In the literature on online communities and electronic knowledge networks we find more attention being paid to understanding social dynamics (cf. Sproull and Arriaga 2007). Among others, Butler (2002), Constant et al (1996), Faraj et al (forthcoming), Lakhani and von Hippel (2003) and Wasko and Faraj (2005) analyze the mechanisms which lead to the motivation to contribute and the sustainability of online groups. In this stream of research, motivation and individual-level action are driven by a combination of self-interest, community orientation, position within the network and broader-level structural properties of the network.

3. Theoretical background

3.1 The concept of field in Bourdieu's work

The concept of field plays a major role in the work of Pierre Bourdieu. In his work, a *field* is a social space which is held together (and defined) by the relations among the agents who belong to it and an "interest" which is shared among those same agents (Bourdieu and Wacquant 1992: 117). For Bourdieu an *interest* is a "socially constituted concern for, and desire to play, given social games" (Bourdieu and Wacquant 1992: 25), to deem the stakes offered by the game worth pursuing (ibid: 116). Thus, there are as many interests as there are fields (ibid: 117). Bourdieu writes that "a field consists of a set of objective, historical relations between positions anchored in certain forms of power (or capital)" (ibid: 16).

A fundamental characteristic of the concept of field is that it is built on *relations* among agents that define the structure of the field (Bourdieu and Wacquant 1992: 99). These relations do not entail any form of interaction or the existence of a social tie: instead, relations are the outcome of relative positions of agents in the field. (Bourdieu often uses a soccer game as an analogy: relations are defined by the positions of players in the game, which are the result of their prior moves and enable their future moves.) In the words of Bourdieu, "to think in terms of field demands a conversion of the whole ordinary vision of the social world which fastens only to visible things: the individual (...); the group (...); and even *relations understood as interactions (...)*" (Bourdieu 1986: 41-2; emphasis added). Bourdieu's way of thinking focuses on a different vision: one based on the relative positions of agents and relations of power. This feature makes it particularly well-suited to the analysis of social phenomena on platforms on which there is little to no interaction among users³.

The positions of agents in these spaces are determined by their stocks of different "forms of capital" (Bourdieu and Wacquant 1992: 97-99). Bourdieu defines *capital* as "accumulated labor (in its materialized form or its 'incorporated', embodied, form) which, when appropriated on a private, i.e., exclusive, basis by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labor" (1986: 241). The fundamental idea is that capital is a valuable resource and thus: (i) can be unequally accumulated by different agents as a result of ongoing social actions and (ii) is simultaneously the stake as well as the weapon in the social struggle occurring within a field. Bourdieu (1986) identifies four such forms of capital. The first is economic capital referring to one's control over physical and financial resources. Second, there is cultural capital, which refers to academic credentials as well as a particular skill or expertise in a given domain (e.g., being a good photographer is a form of cultural capital within the field of photography). Third, there is social capital, which refers to an agent's ability to draw resources from its membership in various "durable" social networks (Bourdieu and Wacquant, 1992: 119). Finally, there is symbolic capital, which is the form taken by economic, social or cultural capital "when it is grasped through categories of perception that recognize its specific logic (...)" (Bourdieu and Wacquant, 1992: 119). In other words, symbolic capital refers to the recognition by others that the accumulation of various forms of capital gives their holder a higher social status and influence in the form of prestige, honor, the right to be listened to, the right to speak, etc. For example, an individual who enjoys a high status within her peer group holds significant symbolic capital, since her status will facilitate her access to further resource accumulation.

The social dynamics in these spaces are centered on the generation of distinction(s) among agents – i.e., "participants in a field (...) constantly work to differentiate themselves from their closest rivals" (Bourdieu and Wacquant 1992: 100)⁴. Each field produces a unique type of capital which is a sub-type of one of the three main forms (economic, cultural, or social). Differential accumulation of capital by agents produces distinction. On UGC platforms, this translates into the *differential valuation* of contributions and users, which is clearly a characteristic of the social processes on these platforms (e.g., higher popularity or relevance scores, greater number of incoming links from other users, etc.).

Finally, Bourdieu maintains that fields typically present some form of barrier to entry (Bourdieu and Wacquant 1992: 100). This, too, is true for online groups who congregate around a shared interest on a particular platform:

³The term *interaction* is used here to signify "(a) process that involves *reciprocal* stimulation and response between two or more individuals" (APA Dictionary of Psychology 2007; emphasis added). On most of these platforms, users *act upon* resources contributed by other individuals (e.g., by ranking or annotating a picture uploaded by another user), yet evidently there is no reciprocal link among them.

⁴Bourdieu notes that the expression "constantly work to" should not be given "intentionalist" readings: "There is a production of difference which is in no way the product of a search for difference." (Bourdieu and Wacquant, 1992, 100)

contributing users are typically expected to create an account, become acquainted with the platform's user interface and features, and learn what kind of content is available and how it is organized before they are able to become active participants in an online cultural field.

3.2 Deriving the concept of online cultural field

We have defined an online cultural field as a group of individuals who use a common IT platform, share a cultural affinity and who, by engaging in the production, dissemination and valuation of user-generated content on this platform, have an influence on the trajectory of other individuals in that field.

While we will draw on Bourdieu's theory in understanding the dynamics in online cultural fields, we will not (at least initially) attempt to characterize individuals in terms of their economic, social, cultural and symbolic capital(s)⁵. Following Bourdieu's own advice for applying his theory empirically (Bourdieu and Wacquant 1992: 161), we will use his general characterization of the notion of capital to understand which aspects of individuals and their behavior best capture the social dynamics in these online spaces. Later, we hope to investigate how these "inductive" notions map onto the forms of capital used by Bourdieu.

A careful reading of Bourdieu's references to different forms of capital allows one to infer the logic behind their selection and to reapply it to a new phenomenon in which different constructs are necessary. First, Bourdieu maintained that "a species of capital is *what is efficacious in a given field (...)*, that which *allows its possessors to wield power, an influence*, and thus to exist in the field under consideration" (Bourdieu and Wacquant, 1992: 98; emphasis added). Second, a form of capital is defined by "the forces that are *active* in the field (and) produce the most relevant differences" (Bourdieu and Wacquant 1992: 101). Third, capital is something that is *accumulated* by specific agents over time⁶, which is then preserved, used, and converted both within as well as across fields. When studying new fields "one of the goals of research is to identify these *active*⁷ characteristics, that is, these forms of capital." (Bourdieu and Wacquant 1992: 107-8)

Thus, we have that our "active characteristics" (a term we will favor over "forms of capital") in the context of online cultural fields must meet three criteria: (i) they must be *efficacious*, either by producing an influence observable in the present or by allowing an agent (otherwise impossible) future course of action, (ii) they must be actively producing *distinctions* among agents in a field; and (iii) they must be the product of *accumulation* over time.

The next subsection concludes the definition of an online cultural field by listing the active characteristics which we have identified and organizing them in the context of a broader framework.

3.3 Potential active characteristics in online cultural fields

In this section we will consider potential active characteristics, distinguishing between user-level and contribution-level characteristics of participants in an online cultural field. The following list of potential active characteristics, which is still being refined, was elaborated in two stages. First, we compiled notes based on our own extensive usage of a number of these platforms (namely, Del.icio.us, Facebook, Flickr, Myspace and Youtube), which we then extended drawing on our review of prior work and conversations with colleagues. At a second stage, we extracted from these notes all concepts which could fulfill the three defining criteria of an active characteristic in a particular online cultural field. In our empirical work with specific platforms and associated online cultural fields, we will inductively analyze which of the potential active characteristics are in fact differentially accumulated by agents in the field and are used to exert influence and produce distinction. Not all fields would draw on all potential active characteristics listed here. For example, some platforms may not allow for links among users, rendering this potential characteristic irrelevant. We can also imagine a platform design which mandates every user to make an exact number of contributions of a particular type. In this case, the number of contributions of this type will not be

⁵Bourdieu wrote that "it is better that (sociological) concepts be polymorphic, supple and adaptable, rather than defined, calibrated and used rigidly" (Bourdieu and Wacquant, 1992, 23). Also, "scientific theory" itself, he believed, "has more to gain by confronting new objects" than by (strictly) adhering to previous theories (Bourdieu and Wacquant, 1992, 161)

⁶"Capital is **accumulated** labor (in its materialized form or its 'incorporated', embodied, form) which, when appropriated on a private, i.e., exclusive, basis by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labor". (Bourdieu 1986, 241; emphasis added)

⁷The (English) original reads "efficient", which is a poor (though frequent) translation of the French term "efficacious". Therefore, we replaced it with the unambiguous adjective "active".

an active characteristic in any field on that particular platform because it would not be possible for users to accumulate it differentially.

At the user level, we have identified the following potential active characteristics:

- **Tenure within a field:** this construct captures for how long an individual has been a member of a particular online field. In addition to its intrinsic interest, tenure can act as a proxy for all other active characteristics which an individual "naturally" develops while participating in an online field and which are not observable by the researcher. Among these, we hypothesize, might be: an increasingly accurate mental model of the interests, opinions and/or preferences of the population in her field; increasing expertise and efficiency in the production of field-relevant resources (beyond that suggested by the mere number of resources contributed: think of the subtle "economies of experience" in terms of time spent doing something versus economies of scale) ; and a better command of the concepts and vocabulary (the latter being especially important on platforms that support tagging) necessary to make valuable meta-contributions.
- **Inbound linkage:** a measure of the inter-user links pointing *to* a user. It should distinguish between links from other individuals within the field being studied and links created by individuals *outside* the field. These can be understood as measures of the overall valuation – by individuals within and outside this field, respectively – of this user's contributions.
- **External valuable information about a person (“external VIP”):** personal information, often in the form of a user profile, or perhaps a link to one's homepage or blog, which allows other users a glimpse into someone's life and history outside of the online cultural field to which they both belong.
- **Status within a field:** all online social platforms support user accounts. The actions (both on that platform as well as elsewhere) of account holders will lead some accounts to become, over time, more prominent and better-known than others.

At the contribution level, we should distinguish between “contributions” (e.g., uploading a picture onto Flickr, or writing a book review on Amazon) and “meta-contributions” (e.g., commenting on a picture uploaded by some other user on Flickr, or rating an Amazon review as “useful” or “not useful”). Characteristics of both of these may have important implications for the positions of agents in a field. Taking into account meta-contributions may be particularly important because some agents in a field may distinguish themselves by focusing almost exclusively on providing meta-contributions. For example, on Wikipedia there is a core of contributors who are recognized as editors and "content organizers" (i.e., makers of a large number of meta-contributions) and are disjoint from the much vaster group of writers of articles. In the following list of characteristics, the term “contributions” refers to both “regular” contributions as well as meta-contributions.

- **Quantity of contributions:** quantity of resources contributed to the field over a given interval.
- **Originality of contributions:** it is often possible (and, on many platforms, likely) for multiple individuals to contribute duplicates of the same resource. This construct is intended to reflect the extent to which an individual contributes resources which were not previously present in that online field.
- **Uniqueness of contributions:** while the originality construct captures the notion of an individual being the first to contribute a particular resource, uniqueness evaluates whether an individual was the only one to have ever contributed that resource. For example, uniqueness of a resource may be associated with a user having a copyright protection of a resource (e.g., a photograph). Many original contributions are followed by other users posting equivalent resources (e.g., the same movie can be posted by many different users on YouTube), but some resources remain both original and unique.
- **Revealed valuation of agent’s contributions:** this construct aims at capturing the degree to which other users have expressed a positive valuation of a user's contributions at the resource-level. The idea is that other individuals express their valuation of an individual's contributions in two ways: through inbound links and through expressions of interest and/or appreciation directed at individual resources contributed by a user. The present construct is meant to capture the latter dimension.

Figure 1 summarizes the potential active characteristics in an online cultural field and the relationships among them. Tenure enables agents to engage in cultural production and develop numerous, original and/or unique contributions. These contributions will be differentially evaluated by other agents in the field (through revealed valuation of contributions and inbound links) thus leading to some contributors acquiring particular status in their respective online cultural fields. External VIP characteristics can impact both the revealed valuations of the contributions made by a given user and her inbound linkage, as well as directly affecting the status of that agent in the field. E.g., if a famous technologist makes contributions on a technical topic, then these contributions may get higher valuation than one would otherwise expect. However, even without her having made a contribution others may link to this person and grant her high status (e.g., by linking to that user). Assuming that agents want to acquire and maintain status within the field, individuals with higher status would be motivated to make valuable contributions. At this stage of our research, we will not map potential active characteristics to Bourdieu’s forms of capital as Bourdieu advocates developing these notions ideographically from data. However, it appears clear at this point that status, as we defined it, is a form of symbolic capital accumulated by agents in the field.

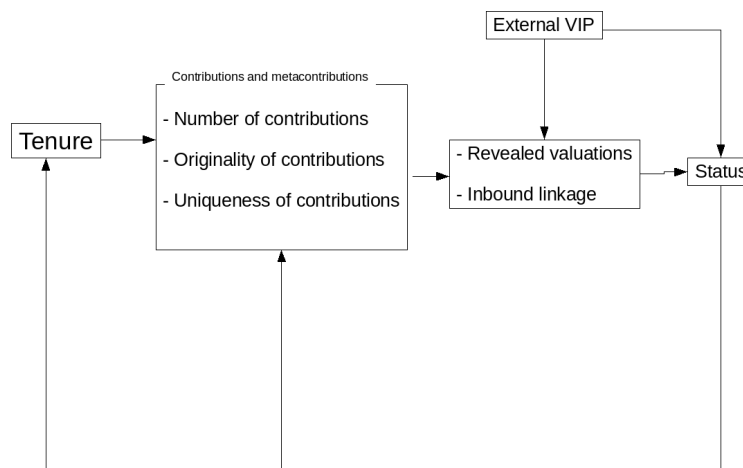


Figure 1: social dynamics in an online cultural field

To illustrate the relationships in the theoretical framework, one might conceive of a user who has spent a lot of time (**tenure**) in a particular field being able to make a lot of **unique contributions** and accumulate a large number of **inbound links**. This user will enjoy a high **status** which will motivate her to continue making valuable contributions. Another conceivable case is that of a user who, upon joining an online cultural field, tries to transform capital which she has accumulated elsewhere (e.g., an offline reputation in a domain related to IT) into an active characteristic which has value in that online field. Such an individual might hint at her high (external) status in the profile which she makes public within the field (**external “VIP”**), thus inducing others within the field to be more appreciative of her contributions (**revealed valuations of resources**) than they would otherwise be. It is most likely, however, that these latter forms of capital will only be preserved if the individual in question supports them by means of **making contributions** to the field. Only by doing so might she keep up with other similarly valued contributors and possibly further enhance her **status**.

4. Work to be done

We are in the process of collecting a longitudinal dataset of user profiles from a major social bookmarking platform. The choice of this dataset was based on two factors. First, the abundance of descriptive annotations (in the form of tags) offers the possibility of computationally identifying a large number of meaningful clusters of users corresponding to different online cultural fields. Second, this platform can be thought of as more conducive to the contribution of material a user finds interesting than those which place greater focus on the social network among users – thus making it a preferred ground for observing online cultural fields.

In order to identify specific cultural fields within this social tagging platform, we will first apply a dimensionality reduction technique (such as principal component analysis) to identify groups of semantically related tags. Two tags will be considered related to the extent they are often applied to the same resources. Second, we will cluster individuals into different fields based on the tags which they frequently use and the semantic group(s) to which those tags belong (which we had identified at the previous stage). E.g., users who often employ tags such as “programming”, “python” and “linux” will likely be members of an online cultural field broadly concerned with free/open-source software development.

Once users have been associated with different fields, we will proceed to compute values for their active characteristics in the context of each field⁸. We will then use various statistical tools to understand the relationships indicated in Figure 1, which pertain to the production, reproduction, and transformation of capital and with that of the cultural field that produces it.

5. Expected Contributions

The goal of the present work is to contribute to our understanding of the processes of online production and valuation of user-generated content. We introduced a framework which combines a number of different factors – the characteristics of users, users’ contributions, and valuation of these contributions by others – in explaining the social dynamics within online cultural fields. Our work builds upon prior work on UGC platforms in two significant ways: it offers a dynamic perspective and it provides a more comprehensive, less platform-specific viewpoint. There is, however, room left for further theory development: (1) how does the content consumption behavior of users impact the dynamics of online cultural fields? (we only focused on contributions for now); (2) how does the competence of users (to make valuable contributions) develop both within as well as outside a given online cultural field?; and (3) what is the relationship between a given online field and other fields within a society? Further theory development can be undertaken by building upon the currently proposed framework with the hope of offering more integrated explanations of both different patterns of participation as well as of the evolution of these fields.

⁸*Most of the active characteristics identified earlier are field-specific (similarly to Bourdieu's original forms of capital). Therefore, a user's active characteristics will take on different values as we study the different fields to which s/he belongs.*

References

- Bourdieu, P. 1986. "The Forms of Capital" in "Handbook of Theory and Research for the Sociology of Education", Richardson, J. G. (ed). New York, NY: Greenwood Press
- Bourdieu, P. and Wacquant, L. J. D. 1992. *An Invitation to Reflexive Sociology*, Chicago, IL: The University of Chicago Press.
- Butler, B.S. 2001. "Membership size, communication activity, and sustainability: A resource- based model of online social structures. *Information Systems Research*, 12, 4 (2002), 346-362.
- Cattuto, C. 2006. "Semiotic dynamics in online social communities," *The European Physical Journal C – Particles and Fields* (46:2), pp. 43-47
- Constant, D, Sproull, L, Kiesler, S. "The Kindness of Strangers: The Usefulness of Electronic Weak Ties for Technical Advice", *Organization Science*, Vol. 7, No. 2
- Faraj, S., Wasko, M. M. and Johnson, S. L. (forthcoming). "The structure and processes of electronic knowledge networks" in *Advances in Management Information Systems, Knowledge Management: An Evolutionary View of the Field*, Becerra-Fernandez, I. and Leidner, D. (eds.). Armonk, NY: Sharpe, Inc.
- Golder, S. A. and Huberman, B. A. 2006. "Usage Patterns of Collaborative Tagging Systems," *Journal of Information Science* (32:2)
- Guy, M. and Tonkin, E. 2006. "Folksonomies: Tidying up tags?", *D-Lib Magazine* (12:1)
- Lakhani, K. and E. von Hippel. 2003. "How open source software works: Free user-to-user assistance", *Research Policy*, 32, 6 (2003), 923-943.
- Marlow, C., Naaman, M., Boyd, D., Davis, C. 2006. "HT06, tagging paper, taxonomy, Flickr, academic article, to read", in *Conference on Hypertext and Hypermedia Proceedings of the 17th conference on Hypertext and hypermedia*. Odense, Denmark: Conference on Hypertext and Hypermedia
- Mathes, A. 2004. "Folksonomies – Cooperative Classification and Communication Through Shared Metadata". Retrieved from <http://adammathes.com/academic/computer-mediated-communication/folksonomies.pdf> on May, 4th, 2008
- Paolillo, J. C. 2008. "Structure and Network in the YouTube Core" in *Proceedings of the 41st Annual Hawaii International Conference on System Sciences*. Washington, DC: IEEE Computer Society
- Porter, C. E. 2004. "A Typology of Virtual Communities: A Multi-disciplinary Foundation for Future Research", *Journal of Computer-mediated Communication*, 10: article 3
- Sen, S. Lam, K. L., Rashid, A. L. M, Cosley, D., Frankowski, D., Osterhouse, J., Harper, F. M., Riedl, J. 2006. "tagging, communities, vocabulary, evolution" in *Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work*. New York, NY: ACM
- Sproull, L. and Arriaga, M. 2007. "Online Communities", in *The Handbook of Computer Networks*, Bigdoli, H. (ed), Hoboken, NJ: John Wiley & Sons, pp. 248-279
- Wasko, M.M. and Faraj, S. "Why should I share? Examining knowledge contribution in electronic networks of practice". *MIS Quarterly* 29, 1 (2005), 1-23.
- Yew, J., Gibson, F., Teasley, S. 2006. "Learning by tagging: group knowledge formation in a self-organizing learning community" in *Proceedings of the 7th international conference on Learning sciences*. Bloomington, IN: International Society of the Learning Sciences