Understanding Large Scale Online Environments with Qualitative Methods

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Abstract

Large scale online environments, in which there are hundreds of thousands, and often millions of links, present an emerging phenomenon where millions of people come together online to share and consume information. The resulting massive amounts of data have been a fertile ground for quantitative researchers. Qualitative studies of these environments are less common, suggesting that the scale and the constant change of these environments pose considerable challenges for qualitative researchers. We present an exploratory study into the challenges and opportunities experienced by researchers conducting qualitative research in large scale online environments, and a meta-analysis of papers from the ACM Digital Library that reveals how few published research studies use qualitative methods to investigate large-scale online environments. We discuss practical and theoretical issues arising from the unique stance of qualitative researchers in these environments.

Keywords: qualitative research, online research, social media, research methods, communities of practice

Introduction

Large scale online environments, ranging from social networks (e.g., Facebook), to peer production networks (e.g., Wikipedia), information dissemination tools (e.g., Twitter), outlets for creativity (e.g., Flickr, YouTube) and collective curation communities (e.g., Encyclopedia of Life, Pinterest), have become a mainstay of online activity. These environments enable users to exchange information, engage in intellectual production of textual and audio-visual content, collaborate on a massive scale, and engage in various discretionary activities. For many researchers these activities and the traces they leave are a goldmine of research opportunities, enabling an intimate glimpse into the social dynamics of technology use, and the processes of engagement, collaboration, production and attachment on a scale larger than ever before (Online Activities, 2000-2009). Where previously online studies focused on relationships formed in small groups such as dyads, families, communities, and groups within organizations, large scale online environments expand the field to include networked relationships encompassing hundreds of thousands and even millions of people.

Perhaps not surprising, these rich and often relatively easy to collect data drive much of the research done on large scale social environments to be quantitative assessments of the strength and divergence of relations created among users, and the structure of the network created by them (cf. Brandes et al, 2009; Cha et al, 2007; & Paolillo, 2008). Quantitative studies can enable researchers to identify changes and trends, areas of particular activity, information-flow directions, gate-keepers, those at the center of networks or those at the outside, those with many links to others or singletons (cf. Gilbert, 2012; Gleve et al., 2009; Golbeck, 2008; Shamma et al., 2009). Yet quantitative studies are not well suited to answer questions related to human values, motivations and meanings, since they offer a rich but incomplete picture of behavior and intention. We propose that qualitative methods are better suited to answer these types of questions, yet qualitative studies of large scale online environments are relatively rare. Given the rapid development of these environments, the question remains, why have qualitative

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methods not been more widely adopted to study them? A general answer to this question is that these environments present many challenges to doing in-depth qualitative work. Some of these challenges relate to issues of scope, size and the ephemeral structure, tools, and culture of these environments (Rotman et al., 2012).

This paper presents an exploratory study into the opportunities and challenges that qualitative researchers face when studying large scale online environments. To do that we conducted nine interviews with researchers known for doing qualitative research, in which we discussed the ways in which researchers reconciled the opportunities offered by large scale online environments and the practical and theoretical problems they face. In addition we examined papers from the ACM Digital Library in order to gauge the popularity of qualitative methods for studying large scale online environments.

Large Scale Online Environments

These environments comprise websites, social networks and other platforms that enable users to engage in a range of activities on a scale larger than ever before. They can be social or egocentric networks like Facebook, collaborative tools like Wikipedia, content production repositories like YouTube and Flickr, or any number of tools and interfaces that are not bound by a specific domain, locale, or size. Based on a networked structure of content and various types of interactions, these environments grow continuously, although some may eventually fail. The online activity produces masses of data detailing user habits from the mundane to the extraordinary.

The massive data created, shared and consumed in these environments are sometimes referred to as “Big Data.” Big Data presents “the big picture from the minutia of our digital lives” (Fisher et al, 2012). The common definitions of Big Data emphasize the size of the data, or its relationality (“Big Data is fundamentally networked. Its value comes from the patterns that can be derived by making connections between pieces of data” (Boyd &Crawford, 2012)) and do not refer to the other properties of the environment in which this data is situated. The concept of Big Data is useful for analyses focused solely on the data that can be derived from online interaction, but is lacking in terms of comprehensiveness and understanding the underlying processes, human values, motivations, and meanings that are associated with these data. For this reason, we prefer to use the term “large scale online environments” which incorporates the data, the tools that are used to create, share, and consume it, and the overall interaction around it.

Qualitative Research of Large Scale Online Environments

Qualitative research has worked its way to acceptance in some areas of information science, Human Computer Interaction, Computer Supported Cooperative Work, and social computing. Discussing the rich, broad, and often contentious history of qualitative work in these fields is beyond the scope of this paper (and is detailed at length elsewhere (Adams et al., 2008)), but we will try to highlight pivotal points that offer a backdrop against which we situate our research.

Qualitative methods vary immensely: from ethnography and ethnographically-inspired methods (e.g. rapid ethnography and detailed case studies), critical studies and phenomenology, to contextual design and “in the wild” studies. The premise of all these variations is to offer researchers and readers alike a systematic yet naturalistic interpretation leading to an understanding of human behavior within cultures, communities, and technological systems (Patton, 2002). These methods go beyond mere traces of interaction and activity, towards a holistic understanding of implicit concepts of motivations, meanings and attitudes that are sometimes different or divergent from explicit behaviors (Dorr-Bremme, 1985).

Due to its naturalistic and exploratory nature, qualitative work was sometimes at odds with the broad, predominantly positivistic research community. As Barkhuus and Rode (2007) illustrated, until the beginning of the 1990s qualitative work was marginalized and considered lesser than positivistic evaluations. But even after the 1990s, qualitative research, and particularly ethnography, was not embraced without debate (Dourish, 2006). To gain acceptance into the broader research community, qualitative methods were sometimes modified: from long immersion in the field in cultural anthropology (ranging from months to years) rose “rapid ethnography” (Millen, 2000), a compressed, short-term form of ethnographic inquiry. Other methodological variations, highlighting qualitative principles (i.e., observations, interviews, and working “in the wild”) have also been accepted.

On a different trajectory, during the past two decades online environments became fertile grounds for qualitative research. Online ethnography, for example (Garcia et al., 2009; Hine, 2000) adopts principles of ethnographies formed in offline environments, and applies them to virtual environments, with the necessary adjustments (e.g. distant observation, extensive use of pre-formed textual and visual artifacts such as transaction logs, conducting interviews using mediated technology). Similar adaptations of qualitative methods are used to study virtual worlds (Boellstorff et al., 2012). The strength of online qualitative work lies in providing comprehensive descriptions of structures, interactions and content. Yet, despite the growing acceptance of qualitative methods, only a small portion of qualitative studies have departed from small scale systems and communities, and have been conducted in large scale environments (cf. Baym, 2000; Boyd, 2007; Nardi, 2010).

Methods

To gain an understanding of how qualitative methods are practiced in current research of large scale online environments, we took a two-step approach: first, we interviewed leading researchers who do qualitative work in large scale online environments. We then used one sub-genre of qualitative methods ("ethnographically inspired" - methods that are adapted from and resemble aspects of accepted ethnographic practices, but do not necessarily adhere to ethnography in its original anthropological sense) and conducted a qualitative meta-analysis (Altheide, 1987) of relevant papers published in leading Special Interest Group in Computer Human Interaction (SIGCHI) conferences over the past 25 years. We conducted this second step in order to gain an overview of the extent to which large scale online environments are studied using qualitative methods either solely or to complement the use of other methods.

Interviews with Qualitative Researchers

Recognizing that this study aims to capture the experiences and challenges that researchers face when conducting qualitative work within large scale online settings, we started by conducting nine in-depth interviews with leading researchers who identified themselves as having conducted qualitative research and are known for doing qualitative research in large scale online environments. The interviewees were chosen based on their methodological choices as reflected in their publications in related journals, books, and conferences. We tried to cast a wide net when inviting interviewees to participate in our study, yet many researchers declined and noted that they only did qualitative research in small scale online settings or offline. The final group of nine interviewees ranged across PhD candidates (2) at the later stages of their studies, to tenure-track (2), and tenured faculty or senior researchers in industry (5), providing a relatively broad scope of positions and practices. Though all were semi-structured interviews focusing on the broad theme of doing qualitative research in large scale online environments, the direction each interview took was shaped by the individual interviewee's experience and thoughts and the dialog created between the interviewers and the interviewees. Seven interviews were conducted face-to-face and two were conducted over Skype. In five of the interviews, two researchers were present and the other four were conducted by one researcher. The researchers took notes after each interview, and while these were not "field notes" in the observational sense, they were used to compliment the interviews and add dimensions the researchers found to be interesting or important. The interviews were 35-120 minutes long, and were audio recorded. They were later transcribed and coded according to the principles of grounded theory (Strauss & Corbin, 1990), where concepts and themes surfaced from the data itself. In order to protect the privacy of our interviewees identifying details such as name, gender, professional position and affiliation and specific fields of study were removed.

Meta-analysis of Published Papers from ACM Digital Library

We used the ACM Digital Library to search for all the papers whose metadata referred to qualitative practices derived from ethnography, such as interviews and participant observation. This query resulted in 664 papers, published from 1988 to 2011.

The papers were first coded in an open, bottom-up, coding scheme, following the principles of grounded theory (Strauss & Corbin, 1990). Two researchers coded a sample of about 8% of the papers, and calculated inter-rater reliability statistics (Cohen's Kappa) between .42 and .98 for three illustrative codes. Consensus on the codes, where there was disagreement, was reached through discussion. The final codebook was then used to analyze a sample of 311 papers, until conceptual saturation was attained.

Discussion of Findings

We set out to explore the practices, challenges, positions and assumptions of qualitative researchers who study large scale online environments. As is often the case with exploratory work, while we were looking to find the ways in which the researchers faced the challenges presented by large scale online environments, unexpected themes came up from the data. These themes can be defined along two axes: practical and theoretical, which will be discussed below. Although we did not look for differences in junior and senior researchers' viewpoint, this became apparent from the data: most practical challenges were brought up by the junior researchers, (tenure-track professors and PhD students), although they were later confirmed by the senior researchers; while senior researchers focused on the broader theoretical challenges they've faced. This could partially be attributed to the career needs of junior researchers, and to publication demands that require them to engage in hands-on research, while senior researchers face these challenges mainly through their work with other collaborators and with their students. Senior researchers also enjoy the perspective of many years in the field, which may allow them to more freely reflect on theoretical and conceptual aspects of research practices. Figure 1 visually represents the coding scheme and the themes that emerged from the data, separating the two major themes of practical issues and theoretical issues, and highlighting the difference between junior and senior interviewees that presented them.

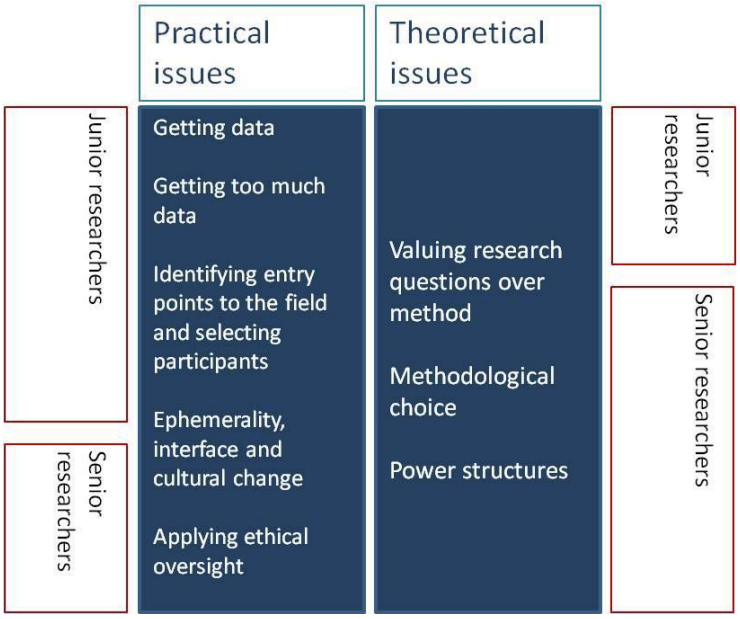

Figure 1. Coding themes from the interviews. Practical issues were mostly reflected by junior researchers while theoretical issues were brought up by senior researchers.

Practical Issues

Large scale online environments brought practical concerns that affected the way qualitative work is done, these include:

(1) Getting enough data, and getting too much data
(2) Identifying entry points to the field and selecting participants
(3) Ephemerality, interface, and cultural change
(4) Applying ethical oversight

Getting enough data and getting too much data. Interactions in large scale online environments create a tremendous amount of data. The popular assumption is that this data is easily available and can almost be cherry picked by researchers. Our interviewees, however, had a different opinion: while log data is, indeed, relatively easy to obtain, collecting data that is a valid base for qualitative research is not as easy. Issues of accessibility and quality came up often in the interviews. Researchers were frequently faced with missing data, commercial restrictions on data use, or with data that could not be validated or was not usable for qualitative studies. As one interviewee summarized: "*We are working with the data that we were able to get… and maybe if you are good you can figure out how to publish it, but mostly you're just going to know a lot"*.

On the other hand, the scope of the data, created a different challenge: qualitative researchers were not only forced to justify their methodological choices (see below), but when acting within the chosen methodology they sometimes felt that they were *"drowning in data"* or *"up to your eyeballs in data"* – though these data were not always useful or even relevant. They quickly learned that large scale online environments do not lend themselves well to holistic observation which typifies qualitative studies. The immense scope of the data, comprised of interactions between millions of users, required the researchers to make *a-priori* decisions about the segments of data that are pertinent for addressing their research questions. As several interviewees mentioned, the sense making process became much more difficult when the quantities of data were outstanding. Size didn't equal quality, and the data available to them presented just a snapshot of a much larger picture, which was hard to capture and deeply understand.

A different aspect of the data scale was the need to justify methodological choice, which, by nature, ignored most of the data and favored extremely small segments of the total data available:

"If you want to do big data where you have millions of data points, it is really hard to argue that we use these numbers and then we go ahead and we interview 20 people. Because how can they be in any way representative of this big data? So these combinations are really hard to argue for".

Getting a grounded notion of what users were doing, why they were doing it, and what may be valued and valid research aspects, proved to be difficult.

Identifying entry points to the field and selecting participants. One of the most challenging issues the researchers faced was that of selecting participants within large scale online environments. Traditionally, qualitative studies focused on relatively small groups: that could have been a company or an office, a community, users of a system, etc. Large scale online environments make the selection of the entry point to the field and selecting the relevant unit of analysis immensely difficult. Issues of effective and relevant participant selection came up in all of our interviews. The researchers we studied agonized over the need to scope various types of users and behaviors and finding the right people that will lead them into the field, among the millions of users who may not be as relevant to them. As one interviewee mentioned:

"Effective sampling. How do you do sampling? I'm constantly baffled by that. Things that we did in the past are just not as effective here"

Some of the researchers found ways to confront this problem, by modifying previously used techniques, reaching out to people they know in real life, or casting a wide net when looking for appropriate people and segments of the data:

"Take your big pile of numbers, go through it. Figure out the interesting cases. In some cases figure out if there is an interesting phenomenon taking place and get curious. And then go, because you have a big pile of data, find the indexical people who seem to be doing this a lot, and then find out what they are doing… the ones who are figuring out new ways of doing things. Talk to them. They might be the future. This is not just theoretical sampling … I would say this is actually looking for the biggest performers"

But this approach presented new issues – looking for "the biggest performers" translates into finding the most prominent and talkative users or popular pages, making it *"impossible to get or very challenging to get peripheral members. There is just self selection which can be problematic"*. The structure of social networks and other collaborative environments does little to enable access to the singleton or small groups that are not highly connected but may present an important phenomenon nonetheless. And while large scale online environments enable researchers to look at all kinds of online behavior, selection will result, in many cases, in data collected from the most convenient areas, and not the most interesting ones.

Ephemerality, interface and cultural change. Large scale online environments constantly change. While changes to the interface can be beneficial to researchers, sometimes allowing serendipitous findings that would have otherwise gone unnoticed, they make longitudinal qualitative studies problematic. The constant change was perceived as both a challenge and an opportunity by some of our interviewees: *"The thing that I found to be one of the most challenging but [also] one of the most interesting things is that my site of study is constantly changing, which means things can be obsolete or completely meaningless by the time I get around to putting a paper together, but it is neat to watch, look at the process"*.

The change in interface sometimes caused changes in the research context, and in the studied online cultures -- reflected in individual communications that were removed or altered, patterns of interaction that changed, users who appeared and disappeared, and links, data, and complete sites that vanished. Some tools or content are expected by default to last for only a relatively brief time (e.g. tweets), leaving the researcher to ponder how to collect and interpret these data. This necessitated researchers to develop strategies to overcome constant changes. Some decide to completely ignore the changes and focus on more general research questions ("*What do you do with that? Do you ignore it? You ignore the actual changes and just talk to the people about their overall experiences*"), others worked manually to recover some of the data that was removed or used web archives to reconstruct it, or built their own websites which they could control and tailor based on their specific needs. In any case, all of the researchers were deeply aware of the issues brought on by external changes and reflected continuously on the effect they have had on their research, even when they couldn't find practical ways of overcoming them.

Applying ethical oversight. Large scale online environments presented ethical issues that should be considered in any research study, but because of scope and scale they are exacerbated. The features of large scale online environments, and especially social networking sites, caused many researchers to inadvertently collect interactions with users other than their "official" study participants. These data can be the result of chat and personal messages, comment threads, friends' lists and tagged photos, among others, and present a cause for concern to the researchers:

"*Ethically it is questionable that we can do what we're doing, basically I have participants that have not consented to be in my study because I am looking at other people's profiles so I see their friends' name and I see their status. They are participating without knowing, in a sense*"

All interviewees mentioned that current IRB standards do not sufficiently address the needs of researchers of large scale online environments and those of their participants. While being overly restrictive in some cases ("*Our IRB wanted us to have every single member of a huge community opt [in]*"), they didn't offer proper guidance in cases of ethical conflicts. As one interviewee summed it up: "*You have informed consent, that's fine, but when the chat message comes up from somebody else and you capture it, you do not have their informed consent, you go back up to ethics school!"*. However, no community-wide discussion of ethical issues pertaining to the specific characteristics of large scale online environments takes place nor are there golden ethical standards to guide researchers. Rather than reframing the discussion at a community level, each individual researcher or research group crafts their own provisional ethical standards, which range from adding a general message reflecting the presence of a researcher in the relevant online environment, to a mandatory no-use and no-documenting rule of information incidental to that obtained from the actual participants.

Theoretical issues

The second theme that came up from the interviews surfaced the core theoretical struggles that qualitative researchers of large scale online environments face. These reflections situated the work of qualitative researchers within epistemological and methodological choices. They could roughly be categorized as:

(1) Valuing research questions over methods
(2) Flexible methodological choices
(3) Power structures within the broader research community

Valuing research questions over methods. Our interviewees defined themselves as qualitative researchers, but when asked about the research process they followed all advocated the primacy of the research question over the method: "*What matters is the question and not the method. What matters is that the question gets answered. And the method that was used were* [sic] *the best we could do to get the most full answer within the parameters we set and the question we posed".* The reason for that was both pragmatic – the need to attain actionable results that will translate into an understanding of cognitive processes, but also an almost philosophical view of what constitutes effective research: "*We are also solving real problems, and it is not useful to the users or to us if we try to solve a problem with the wrong tool, no matter how attractive the tool is*".

As predominantly qualitative researchers, they all favored exploratory studies led by relatively broadly scoped, open research questions, over pre-formulated hypothesis-driven research. The nature of large scale online environments lends itself well to open research questions that offer new paths for exploration. At the same time, such environments presented serious challenges to maintaining academic rigor: the possibility of delving deep into the multitude of interactions, and simultaneously getting a comprehensive, perspective, is seriously limited. To maintain and balance methodological rigor with the broad nature of exploratory research and the vast scope of these environments the researchers focused their questions on attainable goals. Some suggested building up the research questions gradually as the research progresses: *"Practical is what it is. Think about the question. Ask it. How much time do you have? Well, how much data do you need to collect? Do that. Stop. Write. Ask again. Move to the next".*

Flexible methodological choices. The primacy of the research questions over the methods led to a surprisingly agnostic view of methods, and a liberal use of various methods that do not commonly typify qualitative research. Coming from qualitative backgrounds, all researchers shared the belief that "*qualitative methods will yield more interesting data. It will yield a more ecological balance of results*". But in practice, as they were looking for answers to hard questions, implicit relationships and a sense of meaning in large scale online environments, the researchers complemented qualitative methods (e.g. interviews, observations, participant observation, artifact collection) with profoundly quantitative methods, ranging from purely statistical analyses, to content analysis and categorization, to natural language processing, machine learning algorithms, log analysis and social network analysis. The benefits of combining methods were obvious: "*Some of us are very, very, tied to particular methods, [but] most of us are methodologically pretty flexible, because the big scale problems are going to need different ways of solving them*".

The acceptance of different methods stemmed from the researchers' pragmatic view of their research being not only exploratory but actionable. Where the vast landscape of large scale online environments was the case, efficient ways of obtaining multiple points of view compensated for the diversion from purely qualitative methodological rigor. As one interviewee recalled: "*I really think that the statistics by themselves are like breadth and we're depth, and I think that the qualitative method always departs from this. A complementary use of qualitative and quantitative methods makes this study stronger"*. Another said: "*when you talk about convincing people about your methods, it is sometimes useful to have a little bit of quantitative data to sort of use it as a base for some of your arguments"*.

This was also the outcome of an epistemological belief shared by many of the interviewees, where qualitative and quantitative methods offer different facets about the same phenomena: "*I do not believe in a qualitative/quantitative distinction. Any quantitative thing is in relation [to] a qualitative set of assumptions or what constitutes a good analysis for this particular purpose. And so when people say to me: "ethnography always starts this way!", in that you are a zealot*". Although various complementary methods were mentioned by the interviewees, first among them was social network analysis. Social network analysis was lauded for its ability to uncover discrete pockets of potential interest, but was not

accepted unconditionally - interviewees were quick to note the oversimplification of social network analysis products, especially with regard to uncovering cognitive processes, motivational factors and human values. They were troubled by reports of structure and ties that were not followed by an in depth analysis of the findings. One example of such an argument was - "*I find there are a lot of social network analysis papers that come up with a profound conclusion: user 26 is most central in the network. And my response to that is: "and I care, why"?*".

A social network analysis was viewed as a beneficial tool only in combination with deeper qualitative analysis, most interviewees looked in favor on forming multi-method research teams to tackle research about large scale online environments. They saw the benefit in such teams in the potential for mutual learning among team members coming from different research traditions, and in providing different data and understanding through multiple domain and methodological lenses, and deemed multi-method teams to be necessary to move research of large scale online environments to the next level:

"*There is an acknowledgement of the need for additional points of view, but in general we all sort of agree that a successful project is going to have multiple minds, it is almost like seeing the argument that we made for participatory design back in the early 1990s, that if you have a hard problem you need multiple perspectives to solve it*".

Power structures. The combination of research question-oriented work and the relatively unorthodox methodological choices, were a point of contention and conflict between the researchers that were interviewed and some of their research communities.

These tensions stemmed from the juxtaposition of an ever-changing research field (both technologically and culturally), and the pragmatic research needs, on one hand, and the formalist structure of various methodologies, whether qualitative or quantitative, on the other. As was discussed previously, most, if not all, the researchers we interviewed chose to take a practical stance which placed an emphasis on the research question at hand; thus, they placed themselves in an intermediate position which does not fall into a schematic methodological tradition. As a result of that, the researchers faced push-back from both sides – to purely qualitative, and specifically traditional ethnographic researchers, they do not seem reflexive enough, while quantitative researchers frowned upon the lack of measurable data they offered.

The interviewees strongly defended their purposeful situation between the two research communities, as an appropriate epistemological choice when studying the ever-changing large scale online environments ("*I do not pretend that we do the kind of ethnography that someone who goes to study the natives in Bali does. We do not have the time. If we could, that would be lovely. But the technology would change in the meantime*"), and because of shifts in the patterns of interaction that result from the appropriation of the constantly-changing technologies and practices would also change. ("*Anyone who comes to me and says that [we] do not need to know anything about the statistics and infrastructure, I'm like, great. You're essentially a theorist. But what I'm looking for is a profound understanding of the shifting patterns of activity. If you're interested in the shifting patterns of activity then you need to understand something about data usage and uptake*"). All noted the various difficulties that they faced because of their placement between the different research communities.

Some of these difficulties were:

Lacking a sense of community within the broader research community – several interviewees discussed their sense of isolation when doing qualitative work on large scale online environments. Notions of internal struggles among researchers, lack of support for reflexive practices or, alternatively, use of multi-method approaches, contributed to this feeling *("I feel that in some way we're afraid of our colleagues"*).

Writing and reviewing process obstacles – issues related to writing styles, stylistic requirements, and the ensuing reviews, were a recurrent theme in all the interviews. Many researchers railed against the existing templates and stylistic requirements demanded by leading conferences as being overly-positivistic, and not amenable to qualitative/exploratory descriptions. These, by nature, are longer, and require more detail than empirical reports, as was noted by one interviewee: "*I'm not particularly winning this battle, you end up with a massive amazing data, and telling people about one tenth of it through the kaleidoscope of this dreadful template and this ridiculous infrastructure*".

At the same time, the researchers criticized their very own qualitative research community for not crafting proper writing styles that would get the research contribution across to wider audiences: "*Because we're not writing it well, they're not hearing it well*."

Limited dialog and marginalization of qualitative contributions – getting the message across to wider audiences proved to be even more difficult when researches sent their works for publication. Most of the dialog occurs through conference publication and the review process. Several of the interviewees lamented the lack of broader dialog outside of reviews, which they felt were tipped in favor of the empiricist/quantitative model, and rarely allowed for acceptance of exploratory qualitative works. As one interviewee succinctly put it: "*If it is not positivistic it does not exist*". Getting the message across to reviewers proved to be a frustrating experience: "*Reviewers don't understand our methods and we get critical comments that are ill intoned. It is also just tedious to explain the method yet again. If you had someone doing quantitative methods who had to start explaining basic statistics in their paper they would tear their hair out. I feel like that is what we have to do.*"

Yet again, the unique stance of methodologically agnostic researchers proved to be extremely difficult: "*It is inherent in the interdisciplinarity of the field that you are going to meet people who fundamentally do not understand your methods and its* [sic] *basic assumptions."*

The lack of ongoing community-wide dialog on one hand, and the extremely critical dialog manifested through reviews, on the other hand, coupled with the relatively small number of researchers doing qualitative work in large scale online environments, led most of the interviewees to feel marginalized, in a way that made it necessary for them to continuously fight for the acceptance of their research and their practices.

Insights from the Meta-analysis of Published Papers

The meta-analysis we conducted supported some aspects of the findings from interview analysis. However, the themes brought up by our interviewees did not correspond to those that we found in the meta-analysis of the papers: most of the discussion of the qualitative methods that occurred in the published papers was limited to a less rigorous presentation (sometimes lacking details of the research design). The relationship between the research questions and the choice of methods was rarely discussed nor did we see much discussion of ethical issues, either in small or large scale online environments. There was very little discussion about how the researchers cope with challenges when doing this kind of work and how they felt. While it is interesting to reflect on these differences it is also important to remember that open-ended interviews encourage exploration of themes and feelings, while published papers tend to document how a method is used within the context of a specific study; this is especially true given the format and the length of published papers that, as our interviewees mentioned, did not lend themselves well to an in-depth discussion of qualitative work.

The meta-analysis was valuable for revealing a noticeable change in the research environments that were studied: while the use of ethnographically-inspired methods to study offline environments maintains its dominance over the years, online research gained popularity from 2002 onwards with mixed offline and online work maintaining an almost constant stream of 5-7 papers per year. From 2006 onwards, mobile environments became a popular area for ethnographically-inspired qualitative work, with about of 2-3 papers a year.

We were surprised to learn how few studies have used qualitative methods in large scale online environments. Within the 6 papers that focused on large scale online environments, the variation was wide in terms of the methods employed (from long and deep immersion in the field to brief observations), and so was the size of the group or culture studied (a specific environment (e.g., WoW) or cross cultural study). We believe that the findings from our interviews help in understanding this low number – the practical and theoretical challenges that researchers face when doing and writing qualitative work are exacerbated when trying to adhere to the publication practices common in the journals and conferences that were examined. It is possible that preferable venues for publication of such work are monographs and books, but these were not part of our analysis.

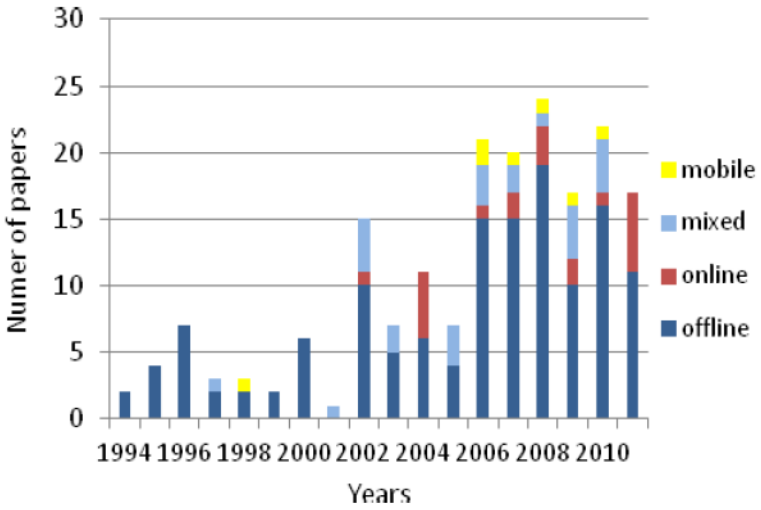

Figure 2. Ethnographically-inspired studies of various environments presented at SIGCHI conferences

Conclusions

Our research has surfaced many challenges that come from the negotiation between the scope of the field, on one hand, and the focused nature of qualitative work, on the other. The practical issues the interviewees faced were the product of pairing various combinations of tried and tested methods that have been used in studying smaller scale settings, with large scale environments. These challenges affected the ways in which qualitative researchers of large scale online environments scoped the research setting, accessed both participants and data, navigated the ephemeral structure and culture of these environments, and maintained a proper level of ethical standards. The practical issues were set against a broader framework of theoretical challenges, speaking to methodological choices and power structures within the broader research community: for example, qualitative research of large scale online environments is not "pure" qualitative work. It stems from the research question and not from the methodological proficiency of the researcher; it is relatively methodologically agnostic and incorporates other, often quantitative, methods to allow for multiple perspectives and to complement the qualitative work; and, it suffers from power issues due to its standing between purely qualitative research and the positivistic tradition. While these challenges are by no means foreign to qualitative work, they are exacerbated by the scope and attributes specific to large scale online environments and they may be responsible for the low number of published papers on this topic.

Looking at these findings, we ask how can we as a community approach the challenges in a way that will support researchers doing qualitative work in large scale online environments and at the same time advance the broader research community.

One way is to address these issues by focusing on qualitative researchers of large scale online environments as a *community of practice*, and craft mechanisms to support them. Communities of practice are defined as "an informal aggregation of individuals engaged in common enterprise… characterized by the shared manner in which its members act and how they interpret events." (Pawlowski et al., 2000). Indeed, from the themes that came up from the data, emerged a clear image of a community of practice that is important to the broader information science research community. The way qualitative methods are adopted, adapted, and practiced around large scale online environments demonstrates their plastic nature and their ability to carry meanings across communities sympathetic to this type of research. While this community of practice is a fluid one, as many researchers weave in and out as they go between different research projects of varying scale and type, it is also a very well defined community, with its own theoretical and practical foci, and a strong sense of isolation from the broader research community.

Focusing on the challenges outlined by our interviewees as having an impact not just on the immediate qualitative research community, but on the broader research community may also lead to a better understanding the relatively low number of papers discussing large scale online environments that we found in the meta-analysis. Unpacking these challenges and addressing them technically and theoretically is needed for qualitative research to flourish in these environments.

The challenges outlined by our interviewees also illustrate the need for a community-wide discussion through which we acknowledge that qualitative methods, along with quantitative methods needed to gain a deeper understanding of how people interact in large scale environments and how these environments evolve and change.

To do that, in a way that will be meaningful to the broader research community entails a growth process, which outwardly embraces qualitative methods as a valued and valid way of researching large scale online environments, and not just accept them as ancillary tools. This process of growth and development entails, by default, some growing pains which are bound to pass in time. Large scale online environments change patterns of interaction, and require new approaches and methods to research them. Formidable though this process may be, it paves the way to one of the new and most exciting areas for information studies research and presents a challenge that we can all embrace.

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