

A New Generation of CSCW: Reinvigorating CSCW Field-based Research Through A Theory-Inspired Reboot

Mark S. Ackerman^{1,2} and Elizabeth Kaziunas¹

¹School of Information and ²Dept. of EECS

University of Michigan, Ann Arbor, USA

{*ackerm, eskaziu*}@umich.edu

Abstract. There are those who feel that the CSCW work studies and other interpretivist research streams need to be reinvigorated; they find many CSCW interpretivist studies to be small incremental elaborations over previous studies or studies that elaborate known findings. This paper argues that CSCW has already begun to make intellectual moves that will reinvigorate itself and that others need to be made. The paper traces how Symbolic Interactionism has kept itself vital and alive, noting how it has incorporated modern intellectual turns in the social sciences. The paper then argues that CSCW as a field and as a community needs to make similar moves, updating its theoretical concerns. We feel it is important for the CSCW community to find a communal understanding of the intellectual desirability, if not necessity, of these moves.

Introduction

Many of the important themes that have sustained CSCW field-based research for the last 25 years have been mined heavily. To be sure, there are still great studies, such as [those that will be at ECSCW'17]. Yet, the many papers on awareness,

online norms, and so on were exciting initially but have declined in number and vigor more recently. There are those who feel that the CSCW work studies and other interpretivist research streams are in decline; they find many interpretivist studies to be small incremental elaborations over previous studies or studies that elaborate known findings in new subject domains (such as medicine or education).

Over the last 25 years, CSCW as a research field uncovered and explored a number of theoretically-based assumptions and findings about socio-technical systems, and did a remarkable job of it. Ackerman (Ackerman 2000) summarized a number of these to its date of publication. For example, they include:

- “Social activity is fluid and nuanced, and this makes systems technically difficult to construct properly and often awkward to use. A considerable range of social inquiry has established that the details of interaction matter (Garfinkel 1967; Strauss 1993) and that people handle this detail with considerable agility (Garfinkel 1967; Heritage 1984; Suchman 1987).”
- “Members of organizations sometimes have differing (and multiple) goals, and conflict may be as important as cooperation in obtaining issue resolutions (Kling 1991).”
- “The norms for using a CSCW system are often actively negotiated among users. These norms of use are also subject to re-negotiation (Strauss 1991).”

There were quite a number in Ackerman 2000; we call out these for a reason to be discussed shortly.

These findings and the working-through of the underlying assumptions were largely, or entirely, the result of field-based research. As Dourish (Dourish 2014) points out, a most CSCW field-based research, until recently perhaps, has been interpretivist in nature. What did this mean in CSCW? CSCW took on implications of interpretivist work. (As always, not everyone will agree with the assertions about interpretivist work or its implications throughout this paper, especially across schools of thought. However, we suggest to readers that they read the paper through, and decide whether the general ideas hold for them.)

First of all, it became normative in CSCW that findings about a class of problems needed to be empirically grounded in fieldwork. These problems would be studied and the best analyses would come from immersion in work settings and other sites. Second, it was understood that these studies resulted in what Strauss (1993) called sensitizing concepts rather than empiricist findings. Instead of interpretivist results being required to be statistically generalizable; it was largely enough for them to be theoretically generalizable. That is, the results - or some variant - are likely to be true in any given social or design situation. It was widely believed that further investigation or further system construction should

watch for these sensitizing concepts, and searching for sensitizing concepts has become the norm for CSCW interpretivist studies.

Finally, CSCW allowed interpretivist studies to be more tightly wrapped around their theoretical assumptions than is the norm for empiricist (hypothesis-testing) studies. Clarke and others (e.g., Clarke 2005, Clarke and Star 2008) talk about theory/method packages. In CSCW, the interpretivist, field-based research has been almost entirely based in micro-sociology. Various flavors of micro-sociology, with its studies of social interaction and the construction of meaning through interaction, proved to be the most useful for requirements analysis and system design, especially when the users were within a small group or organization.

Dourish (Dourish 2014) also points out that a fair amount of CSCW field-based research has been ethnomethodological. These ethnomethodology-based findings include, for example, the quite critical concept of awareness (e.g., Heath et al. 1994, Dourish and Bly 1992, Dourish and Bellotti 1992). However, in this paper, we point towards another micro-sociological theoretical stance¹, that of symbolic interactionism (also called social interactionism or the Chicago School). Sensitizing concepts and findings from SI include the three called out from Ackerman 2000 above: the importance of nuance of social interaction (also found in ethnomethodology); the issues in differing goals and meanings; and, constant negotiation over meanings, goals, and resources. Yet another, articulation work, is a key concept in CSCW. Articulation work (Strauss 1993) is, in short, coordination work among actors in a work or other social setting.

Below, we work through one way to reinvigorate the CSCW interpretivist research agenda; we want to use symbolic interactionism (SI) as a case study of sorts.

First, we will trace through some of the basic assumptions of SI, and briefly show why these have been valuable in our research group's work. Then, we provide an overview of recent theoretical developments in SI. There has been a move to update "classic" SI (which would correspond to, roughly, updating the so-called second Chicago School) with the postmodern and practice turns. It has been argued, successfully we think, that SI is particularly amenable to this update because it had already contained many seeds of post-modernism (as used by the social sciences) and practice theory. We find the moves in this update important; they nicely generalize to CSCW socio-technical considerations as well. Next, we consider why extending a standard CSCW micro-sociological basis is likely to be valuable to CSCW interpretivist work by expanding our previous understandings and opening up new questions.

Many, if not all, of these moves are already known in CSCW. We do not claim to have invented anything new here theoretically. There are certainly those

¹ This is the time in the paper to recognize the difficulty over the term "theory" for ethnomethodologists. While other micro-sociological schools use the term, ethnomethodology is quite pointed in its rejection of

whose work not only reflect all or aspects of what we argue here, but who have been arguing in similar directions, perhaps for years. This paper's argument may merely reflect our idiosyncratic path, especially the first author's, towards these understandings. Nonetheless we feel it important for the CSCW community to find a communal understanding that CSCW is moving in this direction and emphasize a common understanding of the intellectual desirability, if not necessity, of these moves. These moves bring an analytical power not only for social studies but also for the design of new collaborative systems that are critical for CSCW as a community. Basically, we would like to argue for coming to understand the necessity of moving together in an intellectually coherent manner towards new objects of inquiry as well as recognition we are already doing so.

Symbolic Interactionism

We begin with a quick overview of SI because the changes to it in the last 20 years are critical to the argument, and so it is important to understand its premises. Symbolic interactionism came out of the so-called Chicago School of Sociology; it is a micro-sociological theoretical position that has now existed for roughly 100 years in some form. It cannot be held to be a uniform theoretical position: it was and is a collection of individual researchers. SI's tenets have been contested and debated, and its practitioners have varied in their interests and stances. Researchers are often claimed or dis-claimed depending on the particular theoretical issue or history. Regardless, the themes and interests have been roughly consistent, necessarily evolving over time. It is upon this evolution that we wish to focus.

We want to begin by analyzing why this perspective, based in many heterogeneous and differing authors, has been useful. We then want to draw a parallel between the intellectual evolution that is occurring within SI and with the overdue update of interpretivist CSCW. We need to make it clear that we are not arguing for the supremacy of SI. Other schools of thought have had and will have their own paths and evolutions. Instead we want to take a deliberately autobiographical stance, showing why SI has been useful to us along with other micro-sociological interpretivist positions, and show why the current revision and evolution of SI points to paths CSCW must consider and, in fact, is considering so as order to revitalize its analyses of social computing, collaborative computing, and socio-technical systems of all sorts.

We will omit many aspects of SI in the interests of space. Indeed, we will largely ignore the entire "first" Chicago School, except to note that American Pragmatism and the emerging urbanization at the turn of the 19th century heavily influenced its interests and tenets. Mead was the most important Pragmatist for SI, contributing the concept of the "generalized other" and that the individual is emergent in "the dynamic, ongoing social process" (Mead 1934; Mead 1964).

First Chicago School writers also had a rudimentary sense of social ecologies and social worlds (to be explained further below), and a deep interest in the ongoing constitution and reconstitution of social groupings.

Instead, we will jump to the so-called second Chicago School (SI-2), the generation that included Anselm Strauss, Herbert Blumer, Howard Becker, and others. Everett Hughes, with his interest in work and work settings, was also influential in the second Chicago School, although he preceded it somewhat. Erving Goffman is sometimes claimed either as a member or a fellow traveler. SI-2 argued for the following sensitizing concepts:

- Based in Mead and the first Chicago School, various second Chicago School sociologists argued that meaning is constructed in and understood through social interaction with others and in social settings (Blumer 1986). This harkens back to Mead's "generalized other" and to Thomas' "definition of the situation" (Thomas 1923). One can also see this as a reaction to and a conversation with social constructionism (e.g., Berger and Luckmann 1966).
- SI-2 researchers began (again) to explore so-called social worlds, which are collectivities with shared understandings, common vocabularies, norms, and local knowledge. The boundaries of these social worlds are porous and fluid (even overlapping), and individuals may belong to many (Strauss 1991, 1993). Social worlds exist in a rich ecology; Becker's *Art Worlds* (Becker 1982), a wonderful book, explores the many social worlds that together create high art. One can see social worlds as an extension of a more rudimentary form of "social worlds" in the first Chicago School (e.g., Cressey 1932 but also in other students of Park) and also in conversation with social constructionism trying to understand how process continues and creates structure.

For the SI-2 generation, structure and process were not completely separable (except analytically), and were understood as fluid and constantly re-constructed. Especially for Strauss, collectivities are constantly (re)organizing; any resultant order is temporary and is ongoingly re-negotiated (Strauss' negotiated order) (Strauss et al. 1985; Strauss 1991, 1993).

The second Chicago School generation also had a strong interest in work, where "work" was of two sorts. One kind of work was interaction work, as in Strauss et al. (Strauss et al. 1985) and Becker (Becker 1963). If one includes Goffman in the second Chicago School, the emphasis on the work involved in interaction becomes even clearer (e.g., Goffman 1961). The interest in work also included organized work and organized settings, with an emphasis on what allowed for a collectivity to be an "ongoing concern" (Hughes 1971). (This may have been a reaction to more mainstream forms of sociology of the time.) There was an enormous interest in medical settings as one kind of ongoing concern, based in Strauss' move to UCSF's medical school. SI-2 researchers also had

interests in dynamics and temporality as seen in Strauss et al.'s (Strauss et al. 1985) trajectories, or how illness or other situations changed and evolved over time. Strauss' explanation of trajectory shows the connections to context and contingency, harbingers of practice theory in the future. Strauss pointed out, within a trajectory:

...acts do not simply unfold but are shaped in interaction between actors and environments. Environments include contingent events while interactions are of course social, and often collective. So actions, especially of long duration, may be planned, directed, guided, but are at least partly unpredictable, only loosely determined, open-ended, and even may ultimately reach quite unwanted destinations (Strauss 1991, 25).

While other second Chicago School researchers studied social movements (including fashion), delinquents, urban spaces, and so on, we will limit ourselves to the basic tenets so as to move on to current trends in SI.

On a more personal note, the SocialWorlds Research group has found SI to be extremely helpful in understanding socio-technical systems from a social analytic position and in constructing them from a systems development position. The standard HCD (human-centered design) cycle as applied to CSCW, where understanding is validated with people's social settings, fits nicely with the Pragmatists' agenda and therefore with SI. We have used SI, occasionally supplementing its sensitizing concepts with other theoretical positions (distributed cognition, ethnomethodology), in order to understand informal information use, knowledge sharing, and expertise sharing. The basic tenets of SI were useful in understanding specific social worlds - an early social Q&A system in Ackerman and Palen (Ackerman and Palen 1996) and an online game community in Muramatsu and Ackerman (Muramatsu and Ackerman 1998), with the goal of understanding what needed to be incorporated in systems work. Lutters and Ackerman (Lutters and Ackerman 2002; Lutters and Ackerman 2007) looked at the tensions and connections between social worlds, and how these were worked through. We discovered that boundary objects, information or other objects that mediate between social worlds (Star and Griesemer 1989), had to be supplemented through constant negotiation. Users' construction of meaning and identity were examined in Ackerman and Palen (1995) as well as in Lutters and Ackerman (Lutters and Ackerman 2007). The nature of interaction work, especially care work by nurses, was examined in Zhou et al. (Zhou et al. 2009, Zhou et al. 2010). Finally, the duality of structure in information objects and process in knowledge practices was key for the analysis in Ackerman and Halverson (Ackerman and Halverson 1998, Ackerman and Halverson 2004).

The Third Generation of SI

The section above was prelude to a discussion of the changes underway in the third generation of SI. There are many members in this third generation of

Symbolic Interactionists, but here we mainly follow Kathy Charmaz and Adele Clarke in their efforts to "grow" symbolic interactionism. Clarke has an explicit agenda of moving SI towards the post-modern turn and practice theory, and in her writings, Charmaz has agreed with this agenda (Charmaz 2008a, Charmaz 2008b). For them, the required moves are a matter of elaborating and updating themes already in SI. (A certain amount of borrowing from other theoretical perspectives is ignored by them at the same time, perhaps to highlight both the feasibility of the moves and to differentiate SI.) Bringing the post-modern turn and practice theory into SI imparts a certain viewpoint and structuring to all three in analyses.

As Kools states about Clarke:

Her suggested renovations of grounded theory [and in Clarke's view, also symbolic interactionism] include acknowledging both situated knowledges and the situatedness and embodiment of the researcher, expanding the analytic ground of the phenomenon under research to the broader situation where the actions occur, shifting the focus from achieving coherence and commonalities to integrating complexities and heterogeneities, and appreciating the analytic sufficiency of sensitizing concepts and grounded theorizing. (Kools 2008, 82)

However, this set of expansions was foreshadowed in the second school, according to Charmaz:

Anselm's [Strauss'] sociology is rooted in pragmatism, nurtured by empiricism, and developed through interaction. Action always occurs within a context. Social life consists of processes. Everyday actions, negotiations, interpretations create stable social structures; they do not merely exist. Actions give rise to reconstructing meaning; in turn, meaning and symbol inform action. (Charmaz 2014, 127)

Clarke argues for three specific evolutionary moves pushing SI, so as to incorporate the postmodern and practices into SI's thematic foci. We cover these in some detail because they are central to our larger argument. Charmaz' three moves are:

1. SI analyses had to move towards the post-modern turn by "making the broader situation of the phenomenon under research the analytical ground. (Clarke, 2005, 21)" Understanding any given situation is inherently limited, and "[p]artial perspectives [must] suffice. (Clarke, 2005, 22)" Analyzing the situation with a postmodern turn, however, allows one to examine the differences and complexities instead of looking for only the commonalities. Rather than seeing context as the static background in which action takes place, for Clarke and Charmaz, "[t]he important so-called contextual elements are actually inside the situation itself. They are constitutive of it.... (Clarke, 2005, 30)"

Charmaz focuses primarily on individuals and the partialities and complexities in their interactional work. Her move is towards the partialities and complexities in individuals' interactional work. For both, actions and interactions must be co-constitutive with and of situations, moving SI towards the situatedness of actions in practice theory. While

Clarke focuses on social worlds/arenas and discourses as the locus of action, Charmaz focuses on how situated interaction can be understood as kinds of interactional work. Practices, then, are bound to individuals' interactional work and to the situation, and by extension, interaction work can be understood through practices.

2. Social worlds² must become the prime loci of examination, since this is where one may find the "constellation of constraints, opportunities, resources, and other elements" that must be unpacked "in 'the situation' at hand. (Clarke, 2005, 56)" This a direct invocation of practice theory. This is more salient for Clarke than Charmaz, but in any case, social worlds necessarily include the negotiated orderings that mediate these constraints and opportunities, provide for resources, and distinguish among the potential trajectories of their activities. For Clarke the orderings necessarily include the social worlds' discourses, since social worlds are places of language, commitments, and (partially) shared understandings, moving towards the post-modern turn. Clark's interest in meso-analyses (fitting between the micro-scale analyses of interaction work and the macro-analyses of other sociological work) moves her towards the importance of the sites of practice. Charmaz is not opposed to this theoretical move, but she is not as engaged with it.
3. Nonhumans must be considered in the situations under examination: "[the] new root concerns taking the nonhuman explicitly into account.... (Clarke, 2005, 38)" The nonhuman includes various sorts of materialities as well as computers and by extension, software. Including non-humans provides a better analytical stance. Quoting Schatzki, Clarke argues "By acknowledging nonhumans as components and determinants of the arrangements that encompass people, this line of research problematizes the social and challenges traditional renderings of it as relations between people. (Schatzki in Clarke, 2005, 93)"

The premise that situations involve both people and nonhumans also leads to the position where one must also consider the ecology of actors or implicit actors. Indeed, for Clarke (following Haraway 1987 and others), some actors could be hybrids, such as cyborgs, combinations of human and nonhuman. (In CSCW terms, one might consider a hybrid to be a user and her many machines.) Clarke argues SI analyses must be changed accordingly: "...processes of coconstruction and coconstitution can be studied through using the situation as the locus of analysis and explicitly including all analytically pertinent nonhuman (including technical) elements along with the human. (Clarke, 2005, 63)"

² Clarke, following Strauss' inclusion of additional meso-layers, looks at a more nuanced set of loci, but we simplify her argument slightly here.

SI investigations, in this new view, should now include the examination of dense ecologies of interaction work and actors in dynamically changing situations.

These important steps towards new thematic themes in SI point to SI being a living theoretical viewpoint. One way to keep a school of thought vigorous is to respond, incorporate, extend, and even challenge important theoretical moves in other areas of the social sciences. To repeat, SI-3 has moved to include:

- ❑ Incorporating post-modern social science by including the multiple perspectives of different actors as well as their narratives. This allows one to see differences instead of merely the commonalities preferred by earlier social analyses. It also focuses on situations.
- ❑ Incorporating practice theory by focusing on actors within social situations and their interactions.
- ❑ Incorporating non-human actors, including processes of co-construction and co-constitution.

We believe they can, as theories do, both provide inspiration and motivation towards new empirical work as well as new support for field-based analyses.

What Might a Similar Shift Look Like in CSCW?

We believe that CSCW must also fully incorporate these intellectual shifts in its evolution to remain vibrant. As we worked out what this shift in Symbolic Interactionism might suggest for CSCW, we began to create two separate agendas. One is more evolutionary, an extension of current intellectual trends in CSCW. The conservative agenda highlights these trends, and pulls them together in a more coherent fashion. The other is more radical. It suggests new directions, jumps past what is considered as a normal course of investigation in CSCW. The directions, however, do *not* radically alter CSCW's intellectual mission, as we understand it (Ackerman, 2000). Instead we offer the radical agenda to suggest new, but quite possibly unexpected, avenues of inquiry that we believe will be fruitful.

We want to make it clear that we understand that these agendas are currently present in CSCW and HCI. CSCW and HCI, like Symbolic Interactionism, are not in isolation from general intellectual trends. People in CSCW are already oriented towards these concerns and their research reflects it with greater or lesser publishability in CSCW (especially the American CSCW). Yet others are already inching towards incorporating these concerns. We hope here that an understanding of how the efforts are connected will bring a higher degree of collegiality, if not a greater intellectual coherence.

The Initial Agenda for CSCW-NextGeneration

The initial agenda we outline here follows roughly the three changes in Symbolic Interactionism we outlined above.

CSCW researchers have consistently pushed for a view that system requirements must be based in a thorough understanding and appreciation for the users' activities within their social context. The analysis leading to system requirements must be based in immersive field research, as much as possible, in order to understand what people actually do and what that social context actually is. There has always been an uneasy tension between the specificity required for organizationally-adopted systems (such as IT efforts) or those systems focused on particularly tasks and occupational groups (such as air traffic control) and those required for cross-sector or mass-market software products (such as early groupware efforts or later, social media applications). This tension is not easily resolved, as the specificity required for adoptable IT systems must be suitably abstracted for mass-market systems. Viewing practices as practices has the same issue – without abstraction, they are specific to situations and contexts. The issue is made even worse with the decentering moves of the post-modern turn.

The initial agenda attempts, in the same manner as Clarke and Charmaz, to find a way of both embracing this tension and creating a structure for partially resolving it for any given design or study. There are three research implications as part of this agenda:

First, Clarke and Charmaz are moving towards the centrality of interactional work in activity. For Strauss, the types of interactional work were a basis of activity. Strauss and colleagues detailed interactional work, showing this work was central to the tasks that occur in a hospital (Strauss et al. 1985). They observed in medical care basic types of interactional work, at least for that setting: They saw comfort or care work, emotional work (although they called it sentimental work), and of course, articulation (coordination) work. They also detailed biographical work, or the work one does of creating and maintaining an identity, and machine work, the work that clinicians do to handle medical devices. They also briefly discussed, but did not elaborate, information work, the interactional work required to communicate and understand information.

Although others in SI looked at new types of interactional work (in particular, Star and Griesemer 1989's boundary work) Charmaz reopened the examination of and extension to interactional work. Her canonical book, *Good Days Bad Days* (Charmaz 1993), is an in-depth examination of how people live with chronic illness. Framing illness socially as "interruption, intrusion, or immersion," Charmaz explores the ways in which people's identity and the meanings of life events are shaped by the everyday actions and routines around managing medical care. The book details the biographical work involved in changing one's identity from a healthy person to someone with a chronic disease. Part of this biographical work is disclosure work (what Goffman 1961 might have called face work), or

how people choose to present themselves to others. Charmaz in this book also deals with the care work involved in maintaining oneself in the face of a chronic disease.

CSCW researchers have already identified additional types of interactional work in collaborative settings. Implicitly, although not named as interactional work, there have been explorations of care and emotional work (e.g., Preece 2000, Preece 1999) as well as identity or biographical work (e.g., Farnham and Churchill 2011) in online support communities. Jackson and Chen have been more explicitly examined forms of interactional work. Jackson and colleagues examined repair work (Jackson et al. 2012), which combines articulation work and machine work. Chen and colleagues (Park et al. 2013) explored three types of work in informal documentation practices, which she called memory work, abstraction work, and future work. We have investigated how people with chronic diseases must engage in translation work as the medical practices are adapted to the messiness of everyday life (Kaziunas et al. 2013). People often take clinical treatments, such as instructions on taking medication, reinterpret and tailor them to local contexts in order to lead healthier lives. This translation work is important for understanding the differences between the formalized medical practices and people's situated health practices. Similarly Kaziunas et al. (Kaziunas et al. 2015) noted the caregivers of pediatric bone marrow transplant patients engage in reflection work as they negotiate between the social worlds of institutionalized medicine and their everyday lives.

There are, no doubt, many more forms of interactional work that are important across differing social contexts waiting to be uncovered. We in CSCW should open ourselves up to uncovering new, important forms of interactional work and have this be an agreed-upon part of our intellectual agenda. Strauss and colleagues' analysis of hospitals is bound up in the technical milieu he studied in the 1970s. We have new forms of technology, new socio-technical environments, and new labor arrangements to explore.

Second, while the Symbolic Interactionists were always interested in the social contexts in which people live, the third generation centralized activities as being co-constituent with the multiple social worlds in which they occur. CSCW researchers are already investigating how people communicate and interact within a specific social world. For example, how are social identities created and ongoingly re-enacted within social media platforms and online communities? Bryant et al. (2005) showed how identity was co-constituted with the Wikipedia socio-technical world.

Of course, people also coordinate and manage their varying social worlds. How do they create and use practices garnered from others in their varying social worlds? Understanding the interaction with differing social worlds is important for not only health but also all kinds of information flows and informal knowledge sharing.

Research in scientific collaboration (e.g., Cummings and Kiesler 2008, Olson et al. 2008, Sonnenwald 2007), and team work (Hinds and Kiesler 1995), at its core, has this concern. The work of ongoingly managing multiple social worlds also exists in both everyday life and online life. For example, it is particularly important in the practices of health management. We are currently looking at how people interact with varying medical social worlds and try to make sense of them. As mentioned, Kaziunas et al. (2015) examined pediatric bone marrow transplant, describing how parents end up living partway between the medical social world and their previous social worlds of everyday home life, and yet are outside of both. As a result of this and earlier studies, we are currently building a health application that allows people to explore the intersections and effects of the different social worlds of which they may be a part. For example, a person living with diabetes may want to understand the tradeoffs and tensions between the clinical view for insulin management and everyday health practices, like taking herbal supplements to manage glucose levels, common amongst alternative and holistic medicine online communities. In our studies, we have found substantial tensions, as well, between faith-based social worlds and the medical world. In our view, people can use help reconciling the sometimes discrepant and conflicting information from different social worlds. We also want to understand how to provide a "patient" voice, coming from other social worlds to the social world of institutionalized medicine.

We expect to see more work within CSCW designers in how users understand specific social worlds so as to act appropriately within them, but also how they move through and negotiate among many different social worlds. People do so in a nuanced and largely seamless manner (Ackerman 2000).

Finally, Symbolic Interactionism is coming to consider the non-human and the human. For us, users increasingly live in dense collaborative ecologies of machines, collectivities, and social apps. People manage their ecologies, often with the help of others in their varying social worlds. There are new forms of interaction work being created as these ecologies change and grow. CSCW needs ways to talk about the forms of these ecologies, distinguish what kinds of ecologies have systemic effects, and understand how collaboration and social interaction change with differing ecologies. The first hints of this kind of research exist within CSCW in the form of studies of cyber-infrastructure (Ribes and Lee 2010). Bodker and colleagues have started looking at artifact ecologies (Bodker et al. 2015).

Each part of the initial agenda takes CSCW towards dealing with new phenomena, as well as old phenomena of interest in new ways. As a community, we can come to a rough agreement on how it is likely we will extend prior directions in CSCW.

New Directions for CSCW-NextGeneration

A more revolutionary agenda, on the other hand, pushes the implications of the moves within Symbolic Interactionism much further. It begins to challenge some of the ways we do our analyses. CSCW researchers are already heading in these directions, and as a community, we should encourage these moves. Neither of these new directions find uniform acceptance in program committees currently; they should.

We see three parts to this agenda. First, Clarke admonishes Symbolic Interactionists to view “sites of heterogeneity/difference. (Clarke 2005)” In this, she reminds researchers that sometimes difference is as important as similarity. Law (Law 2002) and Mol (Mol 2002) do the same for a wider audience.

Traditionally, CSCW has been most interested in understanding the general design space for a collaborative task. Attention has always been paid to tradeoffs and tensions, but largely in the service of determining specific workable systems. These working systems are optimal points in a charted design space for specific user groups.

In seeing that differences cannot be always reconciled, if ever, and differences do not need to be 'fixed' or cleaned-up, a new way to look for generative design spaces appears. Dourish, in particular, has been concerned for many years with changing the logic of finding specific design points by investigating both system-driven tailorability (e.g., Dourish 1995) and user-driven appropriation (e.g., Dourish 2003). Others have as well. Nonetheless, the complexity of design spaces has hardly been fully embraced in studies or designs.

This move could involve, on the one hand, in Suchman's view, noticing the “long standing feminist concerns with (orderings of) difference. (Suchman 2008, p. 140)” Alternatively, this move could uncover new types of interactional work that deals with the differences (e.g. our translation work and reflection work). It might even subvert the notion of simple difference by examining assemblages, patterns of arrangement that gain stability or change over time through their ongoing enactment (Suchman 2008, Clarke and Star 2008).

Second, Clarke would push an analyst to not only include non-humans in analyses, but also to extend to non-binary framings. This is not just a matter of including people and systems; viewing differences as part of a whole leads to non-binary framings. Suchman (2008) includes as binary framings, “divisions of subject and object, human and non human, nature and culture, and relatedly, same and other, us and them. (p. 140)” Following this, one might consider health, for example, not then about a doctor and a patient with information transfer between the two. Health might, instead, encompass a multiplicity of clinical and patient perspectives, where “the doctor” is part of ever-shifting ecology of doctors, nurses, dieticians and pharmacists, medical equipment, and laboratory processes, and “the patient” includes not only an individual person and body, but her family, Facebook support group, and medical documentation.

Third, if we follow Clarke's push toward the incorporation of the social world and its social context within meso-structures – part of her extension of Grounded Theory in Clarke 2005 – we should also be considering socio-technical systems and their design. CSCW researchers are only now beginning to push on the social part of socio-technical design especially at large scale. Wulf and colleagues for a sustained program that does so quite well (e.g., Wulf et al. 2013). Lewkowicz and colleagues have been considering the meso-social structures of health in their designs (e.g., Tixier and Lewkowicz 2015).

The combination of the three “revolutionary” moves creates new kinds of outcomes for CSCW interpretivist work. In addition to sensitizing concepts, such as new forms of interactional work, there may well be sensitizing relations, contingent on context.

Why do this?

There are numerous arguments for and against post-modernism and the practice turn. They do not matter in the abstract for CSCW. CSCW research is moving in the directions outlined in this paper, but we are doing it slowly and haphazardly. We jeopardize junior faculty's careers when they seek to place work that seems “out there.” Instead what this paper argues is that CSCW as a community recognize the intellectual merit of these moves within an implicit community agreement (where of course the agreement is ongoingly negotiated and “good enough” rather than total).

It is hard for us to see why CSCW would not incorporate the social science moves from the last twenty years. The agendas outlined above enlarge the space of *potential* viewpoints for design; they only enlarge the ability to uncover useful designs and design spaces.

“Classic” CSCW, with its ethnographically-based studies such as the control room studies or the PARC information studies, was once criticized for overly complicating system design. Within CSCW and HCI, this kind of analysis now seems normal, and it has become almost mainstream in Computer Science. Similarly, studies using the practice turn or post-modernism are more complex and difficult to incorporate within designs. Practitioners may or may not adopt the insights fostered by these agendas, or adoption may lag considerably. However, regardless of whether these new moves are quickly adopted by practitioners, research should move towards new themes. These new moves let us tackle important issues such as understanding computational ecologies, incorporating multiple viewpoints, and designing for new forms of social activity or interactional work. Incorporating these moves in a community-wide intellectual agenda akin to that of “Classic CSCW” should nurture new possibilities for design, and seek better ways to understand their constraints, possibilities, and limitations.

Conclusion

Interpretivist theoretical perspectives such as Symbolic Interactionism must necessarily change and update to stay living and vibrant schools of thought and intellectual communities. Incorporating additional theoretical considerations allow new problems to be considered and old problems to be reconsidered. Similarly, CSCW should not keep its theoretical concerns static. Accordingly, in this paper, we have pushed for theoretical moves within CSCW with the hopes that these will lead to new design insights and new empirically-based studies. These system designs and field-based, interpretivist studies can, in turn, serve to examine the utility of these new theoretical moves.

We should emphasize that SI is only one micro-sociological theory that has been of value in CSCW. Each theory/method package illuminates areas of core interest to itself. We personally find SI to be of interest, especially now the core interests of CSCW along with its socio-technical context, have matured and expanded. In this paper, though, we have been much more interested in noting how updating SI in terms of more recent theoretical developments in the social sciences might lead to new theoretical extensions and areas of interest in CSCW. Similar developments in other micro-sociological theories could well show additional paths. We hope these will occur.

We also need to emphasize that these moves are already present in CSCW. Many researchers have taken in some or all of these themes and concerns. We are not arguing that we have invented anything here; if anything, we have been slow to understand the utility of these moves. However, we are arguing that these moves create a new intellectual agenda and a new generation of CSCW research.

To conclude, we believe that pushing towards these new considerations is likely to renew and reinvigorate CSCW's interpretivist research stream by expanding our previous research and opening up new questions. It is time to form a communal understanding of the desirability, if not necessity, of these moves.

References

- Ackerman, Mark S. (2000). The Intellectual Challenge of CSCW: The Gap Between Social Requirements and Technical Feasibility. *Human-Computer Interaction*, vol. 15, no. 2-3, pp. 179-204.
- Ackerman, Mark S., and Christine Halverson (1998). Considering an Organization's Memory. *Proceedings of the Computer Supported Cooperative Work (CSCW'98)*, pp. 39-48.
- Ackerman, Mark S., and Christine Halverson (2004). Organizational Memory: Processes, Boundary Objects, and Trajectories. *Computer Supported Cooperative Work: The Journal of Collaborative Computing*, vol. 13, no. 2, pp. 155-189.
- Ackerman, Mark S., and Leysia Palen (1996). The Zephyr Help Instance: Promoting Ongoing Activity in a CSCW System. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'96)*, pp. 268-275.

- Becker, Howard S. (1963). *Outsiders, Studies in the Sociology of Deviance*. New York: Free Press.
- Becker, Howard S. (1982). *Art Worlds*. Berkeley: University of California Press.
- Berger, Peter L., and Thomas Luckmann (1966). *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Anchor.
- Blumer, Herbert (1986). *Symbolic Interactionism: Perspective and Method*. Berkeley: University of California Press.
- Charmaz, Kathy (1993). *Good Days, Bad Days: The Self and Chronic Illness in Time*. New York: Rutgers University Press.
- Charmaz, Kathy (2008a). A future for symbolic interactionism. In Norman K. Denzin, James Salvo and Myra Washington (eds.), *Studies in Symbolic Interaction*. Vol. 32: Emerald Group, pp. 51-59.
- Charmaz, Kathy (2008b). The legacy of Anselm Strauss in constructivist grounded theory. In Norman K. Denzin, James Salvo and Myra Washington (eds.), *Studies in Symbolic Interaction*. Vol. 32: Emerald Group, pp. 127-141.
- Charmaz, Kathy (2014). *Constructing grounded theory, 2nd edition*. Los Angeles: Sage.
- Clarke, Adele (2005). *Situational analysis: Grounded theory after the postmodern turn*. Los Angeles: Sage.
- Clarke, Adele E, and Susan Leigh Star (2008). The social worlds framework: A theory/methods package. In E. J. Hackett, O. Amsterdamska, M. Lynch and J. Wajcman (eds.), *The Handbook of Science & Technology Studies*. Cambridge: MIT Press, pp. 113-137.
- Cressey, Paul G. (1932). *The taxi-dance hall*. Chicago: University of Chicago Press.
- Cummings, Jonathon N., and Sara Kiesler (2008). *Who collaborates successfully?: prior experience reduces collaboration barriers in distributed interdisciplinary research*.
- Dourish, Paul (1995). Developing a reflective model of collaborative systems. *ACM Transactions on Computer-Human Interaction (TOCHI)*, vol. 2, no. 1, pp. 40-63.
- Dourish, Paul (2003). The Appropriation of Interactive Technologies: Some Lessons from Placeless Documents *Computer Supported Cooperative Work* 12, pp. 465-490).
- Dourish, Paul (2014). Reading and interpreting ethnography. In *Ways of Knowing in HCI*. Springer, pp. 1-23.
- Dourish, Paul, and Victoria Bellotti (1992). Awareness and Coordination in Shared Workspaces. Proceedings of the Conference on Computer-Supported Cooperative Work (CSCW'92), pp. 107-114.
- Dourish, Paul, and Sara Bly (1992). Portholes: Supporting Awareness in a Distributed Work Group. Proceedings of the ACM CHI'92 Conference on Human Factors in Computing Systems, pp. 541-547.
- Farnham, Shelly D., and Elizabeth F. Churchill (2011). Faceted identity, faceted lives: social and technical issues with being yourself online. *Proceedings of the Proceedings of ACM CSCW'11 Conference on Computer-Supported Cooperative Work*, pp. 359-368.
- Fine, Gary Alan (2008). *Kitchens: The Culture of Restaurant Work, Updated with a New Preface*: Univ of California Press.
- Garfinkel, Harold (1967). *Studies in Ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall.
- Glaser, B Strauss, and Anselm Strauss (1967). *The discovery of grounded theory*. New York: Aldine.
- Goffman, Erving (1961). *The Presentation of Self in Everyday Life*. New York: Anchor-Doubleday.

- Haraway, Donna (1987). A manifesto for cyborgs: Science, technology, and socialist feminism in the 1980s. *Australian Feminist Studies*, vol. 2, no. 4, pp. 1-42.
- Heath, Christian, Marina Jirotko, Paul Luff, and Jon Hindmarsh (1994). Unpacking Collaboration: the Interactional Organisation of Trading in a City Dealing Room. *Computer Supported Cooperative Work Journal*, vol. 3, no. 2, pp. 147-165.
- Heritage, John (1984). *Garfinkel and Ethnomethodology*. Cambridge: Polity.
- Hinds, Pamela, and Sara Kiesler (1995). Communication across boundaries: Work, structure, and use of communication technologies in a large organization. *Organization science*, vol. 6, no. 4, pp. 373-393.
- Hughes, Everett (1971). *The sociological eye: selected papers by] Everett C. Hughes*. Chicago: Aldine-Atherton.
- Jackson, Steven J, Alex Pompe, and Gabriel Krieshok (2012). Repair worlds: maintenance, repair, and ICT for development in rural Namibia. *Proceedings of the Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work*, pp. 107-116.
- Kaziunas, Elizabeth , Mark S. Ackerman, and Tiffany C.E. Veinot (2013). Localizing Chronic Disease Management: Information Work and Health Translations. *Proceedings of the Association for Information Science and Technology (ASIS&T) Annual Meeting*.
- Kaziunas, Elizabeth, Ayse G Buyuktur, Jasmine Jones, Sung W Choi, David A Hanauer, and Mark S Ackerman (2015). Transition and Reflection in the Use of Health Information: The Case of Pediatric Bone Marrow Transplant Caregivers. *Proceedings of the Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, pp. 1763-1774.
- Kling, Rob (1991). Cooperation, coordination and control in computer-supported work. *Communications of the ACM*, vol. 34, no. 12, pp. 83-88.
- Kools, Susan (2008). From heritage to postmodern grounded theorizing: Forty years of grounded theory. In Norman K. Denzin, James Salvo and Myra Washington (eds.), *Studies in Symbolic Interaction*. Vol. 32: Emerald Group, pp. 73-86.
- Law, John (2002). *Aircraft stories: Decentering the object in technoscience*: Duke University Press.
- Lutters, Wayne G., and Mark S. Ackerman (2002). Achieving Safety: A Field Study of Boundary Objects in Aircraft Technical Support. *Proceedings of the ACM Conference on Computer-Supported Cooperative Work (CSCW'02)*, pp. 266-275.
- Lutters, Wayne G., and Mark S. Ackerman (2007). Beyond Boundary Objects: Collaborative Reuse in Aircraft Support. *Computer Supported Cooperative Work*, vol. 16, no. 3, pp. 341-372.
- Mead, George Herbert (1934). *Mind, self and society*. Chicago: University of Chicago Press.
- Mead, George Herbert (1964). *George Herbert Mead on Social Psychology: Selected Papers Ed. and with an Introduction by Anselm Strauss*. Chicago: University of Chicago Press.
- Mol, Annemarie (2002). *The body multiple: Ontology in medical practice*: Duke University Press.
- Muller, Michael (2014). Curiosity, Creativity, and Surprise as Analytic Tools: Grounded Theory Method. In *Ways of Knowing in HCI*. Springer, pp. 25-48.
- Muramatsu, Jack, and Mark S. Ackerman (1998). Computing, Social Activity, and Entertainment: A Field Study of a Game MUD. *Computer Supported Cooperative Work: The Journal of Collaborative Computing*, vol. 7, no. 1, pp. 87-122.
- Olson, Gary M, Ann Zimmerman, and Nathan Bos (2008). *Scientific collaboration on the Internet*: The MIT Press.

- Park, Sun Young, Katie Pine, and Yunan Chen (2013). Local-universality: designing EMR to support localized informal documentation practices. *Proceedings of the Proceedings of the 2013 conference on Computer supported cooperative work*, pp. 55-66.
- Preece, Jenny (1999). Empathic communities: Balancing emotional and factual communication. *Interacting with computers*, vol. 12, no. 1, pp. 63-77.
- Preece, Jenny (2000). *Online Communities*. New York: Wiley.
- Ribes, David, and Charlotte P Lee (2010). Sociotechnical studies of cyberinfrastructure and e-research: current themes and future trajectories. *Computer Supported Cooperative Work (CSCW)*, vol. 19, no. 3-4, pp. 231-244.
- Sonnenwald, Diane H (2007). Scientific collaboration. In *Annual review of information science and technology*. Vol. 41, pp. 643-681.
- Star, Susan Leigh, and James R. Griesemer (1989). Institutional Ecology, "Translations" and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, vol. 19, pp. 387-420.
- Strauss, Anselm (1991). *Creating Sociological Awareness: Collective Images and Symbolic Representations*. New Brunswick: Transaction Press.
- Strauss, Anselm, Shizuko Fagerhaugh, Barbara Suczek, and Carolyn Wiener (1985). *Social Organization of Medical Work*. Chicago: University of Chicago Press.
- Strauss, Anselm L. (1993). *Continual Permutations of Action*. New York: Aldine de Gruyter.
- Suchman, Lucy (1993). Do categories have politics? *Computer Supported Cooperative Work (CSCW)*, vol. 2, no. 3, pp. 177-190.
- Suchman, Lucy (2008). Feminist STS and the Sciences of the Artificial. In Edward J Hackett, Olga Amsterdamska, Michael Lynch and Judy Wajcman (eds.), *The handbook of science and technology studies*. Cambridge: The MIT Press.
- Suchman, Lucy A. (1987). *Plans and Situated Actions: The Problem of Human-Computer Communication*. New York: Cambridge University Press.
- Thomas, WI (1923). *The unadjusted girl*. Boston: Little, Brown.
- Tixier, Matthieu and Myriam Lewkowicz. (2015). Looking for Respite and Support: Technological Opportunities for Spousal Caregivers. *Proceedings of ACM Conference on Human Factors in Computing Systems (CHI '15)*, pp. 1155-1158.
- Winograd, Terry (1993). Categories, disciplines, and social coordination. *Computer Supported Cooperative Work (CSCW)*, vol. 2, no. 3, pp. 191-197.
- Wulf, Volker, Markus Rohde, Volkmar Pipek, and Gunnar Stevens. (2011) Engaging with practices: design case studies as a research framework in CSCW. *Proceedings of the ACM conference on Computer supported cooperative work*, pp. 505-512.
- Zhou, Xiaomu, Mark S Ackerman, and Kai Zheng (2009). I just don't know why it's gone: maintaining informal information use in inpatient care. *Proceedings of the CHI'09: Proceedings of the 27th international conference on Human factors in computing systems*.
- Zhou, Xiaomu, Mark S Ackerman, and Kai Zheng (2010). Doctors and psychosocial information: records and reuse in inpatient care. *Proceedings of the CHI'10: Proceedings of the 28th international conference on Human factors in computing systems*.