

Materiality of Connectivity in the Networked Society: A Sociomaterial Perspective

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Abstract

This paper contributes to an emerging discourse on the meaning of technology in today's networked society by exploring connectivity as a hallmark of the networked society. Based on an empirical study of professionals, arguably the forerunners of the networked society, the paper seeks to answer how connectivity matters. Rich narratives from in-depth interviews reveal the diverse ways materiality of connectivity is experienced and performed in the work practices and private lives of professionals. These findings challenge existing conceptual treatments of connectivity as a technical, social, or socio-technical phenomenon, and offer empirical grounding for a novel theoretical view of connectivity. The proposed sociomaterial theoretical framework identifies four different modes of connectivity that explain how connectivity matters to individuals: as materially experienced and enacted in specific sociomaterial practices. As a novel and refined view of connectivity the sociomaterial framework is important for future research on connectivity in the networked society.

Keywords

Connectivity, Sociomateriality, Professionals, Modes of connectivity, Materialization, Networked society

INTRODUCTION

Connectivity is a hallmark of the networked society (Castells 2010): Information and communication technologies (ICT) such as computers, broadband, internet, mobile phones, tablets, wearables, and the cloud, are connecting people, objects, organizations and communities in real time. Connectivity is a fast changing phenomenon that is redefining social and business interactions and relations, reconfiguring workplaces, organizations, markets, politics and public sphere, private and public lives. Connectivity is praised for engendering innovation and radical transformation of the business and social worlds, for creating efficiencies and economic prosperity to ever larger parts of the planet, and also for creating flexibility, freedom, and empowerment on unprecedented scale:

“Today, individuals and communities empowered by connectivity are driving fundamental change. ... Connectivity is transforming whole industries, creating new jobs and disrupting established business models. And by 2020, the Networked Society will have brought about significant economic, social and environmental progress to hundreds of millions of people.” (Ericsson Thinking Ahead blog 2014)

However, while opening up new and previously unthinkable opportunities, connectivity is radically transforming work, placing increasing pressure on individuals and creating tension and information overload, which affect people's lives (Castells 2010; Lash 2002). Promises that connectivity is bringing a greater degree of flexibility, empowerment and liberation (Chesley 2006) seem to be overly optimistic or at least premature. As a new and emerging phenomenon, connectivity is not well understood, puzzling both researchers and practitioners.

The research so far has examined connectivity as a technological or social phenomenon, or more middle ground as a socio-technical phenomenon. While the technological view provides important insights into the ICT infrastructure and its role (e.g. Sawyer et al. 2003; Sorensen 2011) it sees ICT as an exogenous force that impacts on work processes but is distinct from them. On the other hand, approaches to connectivity as a social phenomenon put emphasis on social implications of connectivity such as enabling availability of employees for

work (e.g. Sarker et al. 2012) and social interaction (e.g. Van den Hooff 2004). While making an important contribution both approaches to connectivity tend to assume a static state of being connected and, in their explanations, privilege either the technological or the social.

To address these weaknesses, socio-technical approaches to connectivity focus on phenomena emerging from mutual shaping among ICT and work practices (Kietzman et al. 2013; Koch et al. 2012). Wajcman and Rose (2011) in particular emphasize “how interaction with communication media crucially depends on the materiality of the devices themselves and the way that these entangle with social factors operating in the work environment” (p. 959). While they argue for a sociomaterial approach to connectivity their analysis assumes mutual shaping among social practices and technological devices that implies separate existence of employees and technologies. Their approach thus remains framed by the socio-technical assumptions (Cecez-Kecmanovic et al. 2014).

Understanding the phenomenon of connectivity is inherently limited if connectivity is conceptualized as an ICT-induced transformation of social practices or the mutual shaping of ICT and social practices. While it has been acknowledged that connectivity is integral to work practices and employees’ private lives (the two increasingly blurred), and changing the nature of work itself (Wajcman and Rose 2011), the material implications of being connected remain unexplored. In this paper we therefore seek to explore an important research question: How does connectivity matter? To answer this question we explore possible explanations which rest on an assumption that materiality of connectivity (that is, how connectivity matters) is embedded and embodied in sociomaterial practices in which it is experienced and enacted. We therefore examine how connectivity is materialized in practices and private lives of professionals and how constant connectivity makes a difference. Our empirical study focused on professionals as they are the pioneers in embracing connectivity and co-creating the network society (Castells 2010). Grounded in the interviews of twenty professionals we demonstrate how connectivity matters in different ways when experienced differently (as inevitable or controllable) and enacted differently (as enabling or disrupting) in sociomaterial configurations of work and private lives of professionals. We then offer a theoretical model that distinguishes four ‘modes of connectivity’ as different materializations of connectivity in the lives of professionals. By developing a novel, empirically grounded sociomaterial concept of connectivity the paper contributes to a deeper, material understanding of connectivity as a key emerging notion of the networked society. The paper concludes by discussing implications and further research.

BACKGROUND

Following the above brief comment on the existing research, we expend here the discussion on conceptual treatments of connectivity in the IS and related literatures: ranging broadly from connectivity as a technological phenomenon, to connectivity as availability, then connectivity as social interaction, and lastly to connectivity as a socio-technical practice.

Connectivity as a ‘technological phenomenon’ is primarily related to ICT infrastructure such as the availability of network services or internet connections which enable access to work related data and information (e.g. Chung et al. 2014; Gebauer et al. 2010; Sorensen 2011). According to Sawyer et al. (2003) “connectivity includes the hardware and software (both network and local/household computer(s)), training and support of these elements of the first mile and the pricing/incentives that govern use” (p. 123). Generally the assumption is that better networking technology and affordability enable better connectivity (Sherry and Salvador 2002). These authors also examined one important aspect: when and where to enable or restrict connectivity so as to avoid an undifferentiated flux of interruptions in situations when they are not appropriate.

‘Connectivity as availability’ turns attention to particular implications of technological connectivity. When two or more actors are connected with each other they become potentially available to each other. This includes the general understanding of connectivity as availability for work (Funtasz 2012; Gold and Mustafa 2013; Laurier 2002; Sarker et al. 2012), or as availability for communication with colleagues and team members (Chamakiotis et al. 2014; Licoppe 2010; Richardson and Benbunan-Fich 2011; Shen et al. 2014; Stephens 2012). Connectivity as availability for work is facilitated by technology such as email (Mazmanian et al. 2006) or smart phones (Gold and Mustafa, 2013). Furthermore, connectivity is understood as availability for real-time constant communication with team members by means of technology (Licoppe, 2010; Richardson and Benbunan-Fich 2011; Shen et al. 2014).

Following this understanding of connectivity as availability, one important stream of research examines how individuals and organizations can manage their technological capability to control connectivity and policies, norms and expectations in order to achieve an ‘optimal level of connectivity’ (Dery et al. 2014; MacCormick and Dery 2008; MacCormick et al. 2012). The idea is that in a state of hypo-connectivity, that is when connectivity is too low, organizations can improve their agility, their potential for feedback, collaboration and coordination by increasing connectivity. In contrast, in a state of hyper-connectivity, organizations subject their employees to potential burnout, workaholism, work-life conflict, or unnecessary disruptions (MacCormick and Dery 2008;

MacCormick et al. 2012) suggesting the need to decrease connectivity. Connectivity can thus be optimized when providing an 'optimal level of availability' for work (Dery et al. 2014).

A third stream of research emphasises 'social connectivity' enabled through physical connections. While ICT are important for enabling access, what matters to organizations more than 'physical connectivity' is 'social connectivity' resulting from the use of ICT infrastructure among its employees: "Connectivity is the ability for members of a social system to contact each other directly. Physical connectivity (the existence of an infrastructure that connects all members of the social system) should be distinguished from social connectivity (the actual use of the physical connections). Although the first is a precondition for the second, it is social connectivity in which the actual value of ICT lies" (Van den Hooff 2004, p.105-106).

One important aspect of connectivity as work related coordination is that connectivity can have adverse outcomes that are different for the initiators and recipients of communication requests (Rennecker and Godwin 2005). Depending on their position, status, or expectations about reciprocity, individuals will differ in their preference regarding connectivity. For instance, those seeking answers will tend towards synchronous media in order to continue the task they are working on, while those who have to respond to requests will generally prefer asynchronous communication in order to reduce interruptions and maintain their ongoing task flow (Rennecker and Godwin 2005). As technological development increases physical connectivity it also enables new forms of social connectivity. In recent years this has generated increased research interest in the phenomenon of multicomunication – the engagement in simultaneous synchronous work related communication with different partners at the same time (Cameron and Webster 2011, 2013; Reinsch et al. 2008; Turner and Reinsch 2010). In this context connectivity is thus understood as actual engagement in overlapping communication with multiple partners (e.g. via audio and chat at the same time) which can provide supporting, but also potentially distracting, communications and work flow (Reinsch et al. 2008). When understood as actual social interaction, connectivity is also conceptualized as the degree of openness of the relationship that employees have with other members of an organization. For instance Carmeli and Spreitzer (2009) argue that connectivity is thus related to an organization's potential for innovation and the degree to which employees are thriving in their organizations.

Finally there is a comparatively small stream of research that considers connectivity as a socio-technical practice. Within this stream of conceptualizations connectivity has a profound effect on relationships between different members of an organization. Connectivity is seen as technology-enabled belonging to a social group and as fundamentally altering work relations. Connectivity is, for instance, seen as enabling close links among colleagues and friends (Koch et al. 2012). Being highly connected thus means being very close to each other. Following this understanding connectivity enables different members of a mobile workforce to develop a feeling of belonging to a social group. Connectivity can facilitate the formation of 'mobile communities of practice', where an otherwise dispersed group of employees is able to develop a sense of belonging, which may be beneficial for organizations seeking to strengthen lateral communications among its employees (Kietzman et al. 2013). Wajcman and Rose (2011) specifically emphasize connectivity as sociomaterial practice that is fundamentally altering work relations, the nature of knowledge work and relationships among knowledge workers. Based on an empirical study they contend that knowledge workers' experience of "mediated interactions depends a great deal on the material properties of the particular device or application through which a message is transmitted" (Wajcman and Rose 2011, p. 956). Their underlying assumptions remain essentialist: the workers, communication media and the social context are ontologically separate and characterized by essential properties. While they provide an important contribution to understanding the entanglement of workers' agency with "the materiality of communication media and the social context in which they are used" (p. 956) their conceptualization of connectivity is de facto socio-technical (see Cecez-Kecmanovic et al. 2014; Orlikowski and Scott 2008). Despite their aim they do not reveal a sociomaterial nature of connectivity.

As this review shows, connectivity is emerging as an important research topic in IS research, conceptualized from a wide range of perspectives. What is however lacking is a thorough theoretical engagement with the materiality of connectivity. In particular, engagement with connectivity embedded and embodied in sociomaterial practices is currently missing. In this paper we build on previous research and seek further conceptual engagement with connectivity as a sociomaterial IS phenomenon. We are interested in the emerging phenomenon of connectivity in the lives of professionals that challenges us to rethink the material implications of being constantly connected. We therefore seek to answer an important question: How does connectivity matter? In the next section we describe the narrative methodology we used to explore this question empirically.

METHODOLOGY: EXPLORING HOW CONNECTIVITY MATTERS

We propose that the phenomenon of connectivity and how it matters should be studied as contextually situated and experienced – in our case by professionals. A sociomaterial view on connectivity seems to be particularly relevant given that it enables an investigation of connectivity as it materializes in work practices and private lives of professionals without assuming any a priori properties of practices, professionals, their private lives or

communication media. Drawing from extensive literature on sociomateriality (see e.g. Cecez-Kecmanovic et al. 2014, Orlikowski 2007; Orlikowski and Scott 2008, 2013) we are interested in understanding how connectivity is materially felt, experienced and performed by professionals in their specific sociomaterial work and life circumstances while assuming inseparability among humans, communication media and work practices.

To examine our research question we adapted a narrative methodology (Bold 2012) to study experiences as stories – lived and told by professionals. Through telling stories people attribute meanings to circumstances and events, and narrate and relive their experiences of discursive-material engagements in the world. As a narrative inquiry our study assumes a particular view of experience that professionals have with connectivity. We focused on practitioners in their sociomaterial contexts and sought their stories about living connectivity in their work and private lives. By adopting an in-depth qualitative interview technique (Leavy 2011) we aimed at revealing authentic storied experiences of connectivity and how it mattered in the lives of professionals. To achieve this we developed an interview guide that included questions regarding the nature of the work practices, roles and private life circumstances; the engagement with ICT and in particular communication media; past and current experiences with and responses to being connected; and implications of constant connectivity on their work and private lives.

We recruited 20 professionals (9 women and 11 men, ranging from their late 20s till early 60s) via the academic links with industry, social media, and through snowballing. As we aimed for variety in experiencing connectivity we recruited participants from a wide range of professional occupations – HR director, IT research manager, commercial manager, freelance journalist, senior software developer, freelance consultant, partner and managing director, association manager, business analyst consultant and others. The interviews took typically 1.5 hours (17 conducted face-to-face and 3 via Skype during 2013). All interviews were audio-recorded and transcribed.

Our narrative analysis started with interview transcripts, that we analysed, coded and interpreted using thematic analysis of narratives (Ezzy 2002; Bold 2012; Guest 2012). The coding process started with open-codes without any particular theoretical concept or framework in mind. The codes and coded material were then discussed and compared leading to redefinitions, refinement and consolidation of the open codes. Further coding was driven by the research question: How does connectivity matter? The open-codes (and coded material) were analysed by searching for any views or patterns of connectivity and the ways they mattered for interviewees. After the third iteration of re-coding and classifying four patterns of connectivity emerged: ‘being connected as a form of life’, ‘struggling with connectivity’, ‘burnt by connectivity’, and ‘restricting connectivity and protecting oneself’. These patterns present four distinct modes of connectivity, each exemplifying a way of mattering to professionals. These modes of connectivity are presented and illustrated with short stories (vignettes) and quotes in the next section. It is important to emphasise that this was a recursive, reflexive process of moving from practitioners’ narratives and stories to an interim and final research text (Leavy 2011). Respect for participants was essential in our retelling of professionals’ stories “so that [their] voices are heard in a way that best represents their situation” (Bold 2012, p. 147). The grounding of theoretical understanding and explanation of connectivity on participants’ stories – presented in the final research narrative – contributed to authenticity and trustworthiness of our narrative inquiry. However we need to keep in mind that the variety of storied experiences we revealed and the research narrative that we composed to represent and theorize these experiences, are inevitably partial and incomplete.

FINDINGS – FOUR MODES OF CONNECTIVITY

The findings summarized here provide authentic narratives extracted from the in-depth interviews that illustrate the four modes of connectivity:

Being connected as a form of life

For many professionals we interviewed ‘constant connectivity’ – day and night, in business and private life – is a way of living, inevitable and essential in their lives. Their work practices and lifestyle cannot be imagined without connectivity. They immerse themselves in all kinds of technologies and communication media in order to work and collaborate with colleagues within or without an organization; to develop and maintain relationships with colleagues and clients; to engage with broader networks of professionals, organizations, and associations that enable them to track what is going on in their profession, both locally and worldwide, and to seek new job opportunities.

Carl’s story (Vignette 1) exemplifies this mode of connectivity. Carl is single and working from home. He is connected all the time: for him ‘to live is to be connected’. Carl feels that constant connectivity is an ‘accepted’ part of being a ‘professional’. He suggests that this is the same for all professionals and gives the example of a vet being on call 24 hours a day.

Vignette 1

Being connected as a form of life

Carl, consultant, research economist

The four of us [located in different countries] formed an international consultancy business. We have laptops and 3G enabled keys, mobile net keys, which means we can work wherever we are. So if we're on a plane or catching a train, we can work there as well as at home, which increases our productivity. If we need to meet we largely use Skype and that way we can work on documents together that we scan and share. We also use our Blackberries a lot for group conference calls and WebEx to link with other people. We're in contact with each other at all hours and because we're all working from home it's easy to just go and turn the computer on. We're often emailing each other at 2:00 or 3:00 in the morning. Working like this means I don't really have a private life any more. I take my Blackberry with me everywhere I go and get phone calls whenever. You can have people calling at any time saying: 'Carl I know it's Sunday, I know you're at your parents' house, but if I don't speak to you now I won't be able to finish this part of the project, so can I chat to you now?' I've been at family meals where everyone's been talking away and I've had my finger in my ear and my Blackberry in my other ear.

It's taken a toll on my private life but as a professional there's an acceptance of that, there's an acceptance that occasionally your job is going to intervene on your private life. You know the word 'professional' comes from 'profess' meaning to hold or say that you actually have some knowledge, and the only way you keep being paid is if you 'profess' to having that knowledge. If somebody needs your knowledge and you want them to pay you for it, then you give it to them whenever they need it. In exactly the same way as a vet does when they get a phone call at midnight saying this cow's not very well, please come and sort it out and they'll do it because they're a professional.

For Chris, a software engineer with a family, connectivity is a way of working and living; he deals with technology, he writes websites and consulting documents; he is constantly in touch with his clients, colleagues and friends via email and social media like Facebook and Twitter. His laconic expression – “I live in the browser” – summarizes his emersion in technology that includes constant connectivity as a form of working and living his private life.

Struggling with connectivity

Many participants express the view that they feel an obligation to be connected but are struggling with managing connectivity. Connectivity is experienced as useful and controllable but also difficult to manage. For Emma (see her story in Vignette 2) connectivity is a ‘double edged sword’, it is useful and vital to keep up with busy schedules and juggle work responsibilities and family life, but she feels it is addictive and sometimes stressful.

Vignette 2.

Struggling with connectivity

Emma, HR Director

The problem for me is that I have no boundaries when it comes to connectivity. Everyone in my family is really connected because my husband is in IT so he and my two boys have iphones. Most nights we're all sitting at home on our phones and laptops, it's awful really, I've made this rule that there are no phones, computers or TV at dinner time but as soon as it's finished we're back on our phones or laptops. Honestly, I think it's addictive, it's like a drug almost, that you feel you have to respond, it's nothing for me to still be messaging people late at night or checking my phone at 4am. I'm worried that I might miss something but it's just ridiculous isn't it, I mean no one is dying. I think it's a generational thing as well, I have friends who are older than me and they're not nearly as addicted to technology as I am or the younger people I work with. But everyone at home is the same as me, my husband and my boys; it's just hard to break the mould. Though I have been getting more concerned about it lately and I've tried some nights to turn my phone off and leave it in my bag. But it's hard you know with work because I'm often in back-to-back meetings with people during the day, so it's not until the evening that I have time to get to my emails and messages. It's so hard just trying to keep up with my emails and I'm always trying to push stuff back. When I travel it's typically a 16 hour day and when I'm away I'm also trying to keep up with what's happening in the family, emailing or calling my husband because my daughter has special needs, and my husband was recently laid off, so I'm the sole breadwinner. I don't think I can work any harder and in my personal life I just don't have the bandwidth for anything more than family and close friends.

Amir, a senior IT researcher, comments “everybody is connected and sometimes sick of it...it's very hard for people to get disconnected, not only myself, my wife too and my friends and everybody is having that connection in mind.... checking Facebook and checking email, and checking everything. I do that, to be honest, I do it a lot. [laughs] So yeah, connection is good because it keeps me informed. ... But then at the same time it may impact on private life as well”.

Edward, senior designer, is aware that he can (should) control connectivity but he cannot resist it. “So it’s a constant struggle ... [connectivity] tends to be invading in my life. ... the first thing I’m doing in the morning, the very first thing as soon as I open my eyes is to look at my emails and look at my Twitter feed. And my wife hates it. Uh, generally she’s sleeping but she just hates it. ... I generally take, I don’t know, 30 minutes, just looking at things”.

Burnt by connectivity

Constant connectivity, working 24/7, can be highly stressful and harmful. While many participants experience connectivity as necessary and inevitable, some reported distress and disruptions in both their work and private lives. Helen’s story of being ‘burnt by connectivity’ (Vignette 3) resonates with many experiences of being overworked and unable to balance work and family responsibilities.

Vignette 3.

Burnt by connectivity
<p><i>Helen, IT Designer</i></p> <p><i>Now that I’m in my forties I can see that there’s no balance, I think the way we work is really destructive and I think relationships and family life suffers, I know mine has. In the past I felt addicted but after the burn out last year it’s become really easy. Now I actually have a physical dislike for being connected with technology. A friend of mine just quit the industry after a major burnout and I’ve stepped back a lot for the same reason. I think the whole IT industry is just eating itself, there’s a lot of hot air and a lot of trying to keep ahead of the wave. I think there’ll be an information implosion and I think that phones will get turned off, which will be great. Others must be feeling the same because I keep getting information about these workshops that teach IT people some of the old crafts like weaving, leather work, basketry and sketching. There’s a lot to be said for that kind of hobby or just sitting and staring at nothing for an hour to empty your mind and then see what floats up rather than filling it constantly with stuff. I find that the technology fills me up and I feel like I’ve been eating garbage when I’ve been on my computer all day, whereas if I just sit and think quietly, I feel like I’ve had a proper meal for my brain.</i></p>

Like Helen, other interviewees feel stressed by ‘being switched on all the time’, overworked and negatively affected by constant communication. The biggest challenge is managing work-life boundaries and balance. Monica, an association executive, used to work constantly 24/7 while teleworking from home for a company: “I could not shut it off. ... I was working all the time and completely stressed out and getting mad at our children. I didn’t have an office that I could close the door to and they were young enough that when they got home from school they needed some attention and I was getting frustrated ... and be angry at them for them just being children and then not being able to get my work done”.

Restricting connectivity and protecting oneself

Some participants reflect on and learn from their past struggles and discontent with constant connectivity. Max, a freelance consultant, objects to expectations to be available any time to his clients: “For the client you’re transparent, ... I think one of the things we are at risk at is of training clients to think like [you are available any time], to expect that we will just drop everything and do something out of hours ... I think that’s a real problem, you just don’t get that down time.” Many have learnt from experience to restrict connectivity (and availability) and put boundaries around their work to protect themselves and their private lives. Patrick’s story (Vignette 4) tells us how he managed to limit his connectivity and his work hours which helped him be more productive and take an active role in parenting.

Vignette 4

Restricting connectivity and protecting oneself
<p><i>Patrick, Commercial Manager</i></p> <p><i>I really prefer face-to-face meetings because you can pick up on subtle cues that you miss when you’re on Skype or other systems like that, but because of our distributed team that’s just not possible. I’m married with one son so it’s great that I can work from home at least two days a week, though this also leads to quite a lot of virtual communication. I’m lucky because we have a great team and a good relationship with the client partly because of the way we can share information with them about the progress of the project through ICT. This means that the client doesn’t need to impose artificial rules related to our performance so it’s a lot less bureaucratic than other jobs I’ve worked on. It also means it’s easier for me to work from home, which is important because I work odd hours and I like to keep fit. Now I limit the amount of hours I work, set a finish time and try not to go past that. It seems that this strategy is working pretty well as I’m a lot less stressed than I used to be.</i></p> <p><i>I do something similar when I go into the office, in the past I used to spend the whole commute working,</i></p>

answering emails, writing reports, now I have a system with my emails where I just go through them deleting what needs to go and leaving the others to read later. That takes about half the bus ride and for the other half I relax by reading an e-book or something like that. Reflecting on this I've realised that the autonomy I have in my work is important, in fact if a client wanted me to work 9-5 I'd turn the job down. I need to be able to set my own boundaries otherwise I'd be working all the time and that's just not healthy. I learnt a lesson a while ago when I tried to do everything and got really stressed, which impacted negatively on my personal life. Now I set myself attainable goals for a week controlling my workday so I don't get stressed and leaving myself time to be with the family. I might get up early and work so I can go to meet my son's teacher later in the day, things like this are really important and it's a lot healthier for me and them.

Ivan, a commercial manager, restricts his work e-mail automatically: "I don't receive it on my phone between 6pm and 8am. And that really helps because I found myself, before I made that setting, to read work e-mails at 10pm and, you know, if something upsetting comes along then, I had sleepless nights because of that".

The empirical evidence presented here, while necessarily limited and concise, illustrates a range of patterns or modes of connectivity discovered from professionals' narratives. The stories provide rich evidence that connectivity does matter, and that it actually matters a great deal to the professionals studied. How these different modes of connectivity can be theorized is discussed next.

DISCUSSION – THEORIZING CONNECTIVITY

Connectivity, as our findings show, matters in different ways and is experienced differently in specific sociomaterial configurations of the work and private lives of professionals. These differences are revealed in the four patterns or modes of connectivity presented above: being connected as a form of life; struggling with connectivity; burnt by connectivity; and restricting connectivity and protecting oneself. The findings suggest that constant connectivity is a more complex phenomenon than currently described in the literature. The different modes of connectivity or different ways connectivity matters to professionals cannot be explained by specific technological conditions and characteristics of access and physical connection, that the technological view would have it (Chung et al. 2014; Gebauer et al. 2010). The concept of availability is useful in discussing connectivity but the same availability matters differently in specific sociomaterial contexts (professionals' work practices, private lives, experiences). Similarly, the notions of the hypo, hyper and optimal level of connectivity that may be useful for organizations in measuring and managing their technological capability (Dery et al. 2014; MacCormick and Dery 2008) are not helpful in explaining different materialization of connectivity revealed in the findings.

Another potential explanation of connectivity by Wajcman and Rose (2011) that posits mutual shaping of actors and technology in which 'mediated interaction' depends on the material properties of technological devices, provides only limited explanation. It is not only the materiality of technology or agency of actors or materiality of social contexts that are at stake here. Further, it is also not their mutual shaping (that assumes they exist and then interact) that can explain different mattering of connectivity. More consequentially it is their co-constitution through relations that can help us understand and explain the different materializations of connectivity that make a difference. Assuming relational ontology (everything exists only in relations) (Cecez-Kecmanovic et al. 2014; Orlikowski 2007) and all entities (professionals, technologies, work practices, life circumstance) in the process of becoming, we propose a sociomaterial explanation of our empirical findings – the four distinct ways connectivity matters.

How connectivity matters in the four modes of connectivity identified from the narratives of professionals can be understood within a dynamic field of connectivity described by two dimensions: 1) experiences of connectivity as *inevitable* and inescapable or as *controllable* and manageable, and 2) enactment of connectivity as *enabling* or *disturbing* and disrupting. These two dimensions define a theoretical model presented in Figure 1 that distinguishes four modes of connectivity as different materializations of connectivity in specific sociomaterial configurations of professionals' work and private lives. When connectivity is experienced as inevitable and its materiality feels inescapable, it can still be differently enacted by professionals. For those like Carl being constantly connected has become inevitable: "to exist is to be connected". They live and breathe connectivity as a way of life (mode I). They thrive on constant connectivity and catch or create opportunities for new business ventures globally and on the fly. Constant connectivity is materially enacted as enabling and productive to what it means to be a professional (of who they are), of what the work and their lives are about. Connectivity in this mode is normalized as natural and justified.

On the other hand, while experiencing constant connectivity as inevitable, Helen and Monica (among others) have enacted it as highly stressful and frustrating, and disturbing both their work and private lives. "Being switched on all the time" they felt burnt by connectivity (mode II) as they worked 24/7 at a fast pace, juggling work and family obligations. The materialization of connectivity in their specific work practices, intertwined

with private life circumstance, enfolded as disturbing and damaging for both. Constant connectivity materialized as fiasco: as professionals they became inadequate and as parents they failed.

Connectivity performed as	Enabling	Mode I <i>Being connected as a form of life</i>	Mode IV <i>Restricting connectivity and protecting oneself</i>
	Disturbing	Mode II <i>Burnt by connectivity</i>	Mode III <i>Struggling with connectivity</i>
		Connectivity as inevitable	Connectivity as controllable

Materiality of connectivity

Figure 1 The dynamic field of connectivity as materialization in the lives of professionals

When connectivity is experienced as controllable, despite all the hype and pressure for being constantly connected, the outcomes are different. Connectivity gets performed differently. For some practitioners who experience connectivity as controllable but who cannot resist it and become addicted connectivity is enacted as disturbing (mode III) and becomes an ongoing struggle. While phones, laptops, tablets, can be shut off or controlled in other ways some professions, like Emma, Edward and Amir struggle with constant connectivity. They feel addicted, overwhelmed with messages, posts, Facebook contacts, and calls, and do not succeed in controlling or limiting them. “It’s just hard to break the mould”, concedes Emma, “People can get you all the time. And there’s an expectation I think that you are available all the time”. Constant connectivity is by no means limited to professional practices. It also permeates all aspects of professionals’ private lives. When talking about their challenges and struggles of being connected most participants do not separate their professional from their private communications with family and friends.

Other practitioners learnt to restrict connectivity (mode IV). They experience connectivity as controllable and enact it as enabling in their work practices and private lives. While work demands and pressures from family and friends are increasing, Patrick, Max and Ivan give examples of how connectivity can be effectively restricted in various ways. They reflect on and problematize the assumption of constant connectivity and promote practices of self-protection.

Connectivity comes to matter through particular entanglements of professionals, communication media, work practices and private lives, all being co-constituted through this process. The theoretical framework for exploring materiality of connectivity (Figure 1) describes the dynamic field of connectivity characterized by: continuously enfolded experiences and enactments of connectivity; reconfiguring of communication media entanglement in work practices and private lives; work relations ever expanding and invading the space and time of professionals; and shifting boundaries between work practices and private lives. Professionals themselves reported learning to restrict connectivity after struggling or being burnt.

Materiality of connectivity is made possible by various technologies (communication media) but it is not the property of technology. Materiality of connectivity exists only in practices, in relations among the actors, technologies and practices and is always performed as mattering, as something that matters to somebody or something. The same constellation of technologies (servers, mobile phones, social media and others) entangled in different practices would produce different materialization of connectivity.

Materiality of connectivity or how connectivity matters is a process of becoming – a dynamic enfolded of experiences of being connected (in the past and present) and enactment or performing of connectivity in the present and future. It is specific materializations of connectivity that make a difference, from mode I to IV. Every professional participates in and contributes to practices that assume connectivity and at the same time perform connectivity as a particular materialization. Through various enactments of connectivity professionals engage in deeply relational practices in which communication media are indissociable from work processes, professional responsibilities and expectations. These practices in turn redefine what it means to be and act as a professional, whether performed like Carl (always on) or like Patrick (restricting connectivity). Materiality of connectivity is becoming constitutive of being and acting as a professional.

CONCLUSION

The paper contributes a novel conceptual view of connectivity – the materiality of connectivity – that is empirically grounded and theorized as a dynamic sociomaterial phenomenon. The findings indicate that connectivity is a more complex phenomenon than either technical, social or socio-technical perspectives on connectivity suggest. Grounded in the narratives of twenty professionals we propose a theoretical framework that distinguishes four modes of how connectivity matters, defined by experiences with connectivity (as inevitable vs controllable) and enactment of connectivity (as enabling or disturbing) in sociomaterial configurations of work practices and private lives. Materiality of connectivity explains how connectivity is consequential for people’s capacity to do their jobs and juggle their professional and private lives. Connectivity is implicated in the changing nature of work and organizing practices and what it means to be and act as a professional. As the evidence demonstrates connectivity is materialized in specific sociomaterial (re)configurations of professionals’ work and private lives. Connectivity (“being connected or constantly online”) is performed and becomes materialized through relations among professionals, their work practices and private lives, and communication media. Materialization of connectivity in turn reconfigures and reconstitutes those professionals, their responsibilities and expectations, the nature and speed of work practices, work-life balance, and communication media.

The proposed theoretical view of the materiality of connectivity has important implications for research and practice. It opens new avenues for researching deeper implications of specific modes of connectivity for practitioners and organizations by focusing on reconfiguration and reconstitution of relations in each mode. We suggest further developments of the dynamic sociomaterial understanding of connectivity and its materialization that will lead to practical recommendations for managing connectivity and addressing its disturbing and damaging effects.

REFERENCES

- Bold, C. 2012. *Using Narrative in Research*, SAGE Publications, Thousand Oaks, CA.
- Cameron, A.-F., and Webster, J. 2011. “Relational Outcomes of Multicommunicating: Integrating Incivility and Social Exchange Perspectives,” *Organization Science* (22:3), pp. 754–771.
- Cameron, A., and Webster, J. 2013. “Multicommunicating: Juggling Multiple Conversations in the Workplace,” *Information Systems Research* (24:2), pp. 352–371.
- Carmeli, A., and Spreitzer, G. M. 2009. “Trust, Connectivity, and Thriving: Implications for Innovative Behaviors at Work,” *The Journal of Creative Behavior* (43:3), pp. 169–191.
- Castells, M. 2010. *The Rise of the Network Society*, 2nd ed., Wiley-Blackwell.
- Cecez-Kecmanovic, D., Galliers, R., Henfridsson, O., Newell, S. and Widgen, R. 2014. “The Sociomateriality of Information Systems: Current Status, Future Directions”, *MIS Quarterly* (38:3), pp. 809-830.
- Chamakiotis, P., Whiting, R., Symon, G., and Roby, H. 2014. “Exploring Transitions and Work-Life Balance in the Digital Era,” In *European Conference on Information Systems 2014*, Tel Aviv.
- Chesley, N. 2006. “Families in a High-Tech Age: Technology Usage Patterns, Work and Family correlates, and Gender”, *Journal of Family Issues* (27), pp. 587-608.
- Chung, S., Lee, K. Y., and Kim, K. 2014. “Job Performance Through Mobile Enterprise Systems: The Role of Organizational Agility, Location Independence, and Task Characteristics,” *Information & Management*, (51:6), pp. 605-617.
- Dery, K., Kolb, D., and MacCormick, J. 2014. “Working with Connective Flow: How Smartphone Use is Evolving in Practice,” *European Journal of Information Systems*, (23:5), pp. 558-570.
- Ericsson Thinking Ahead blog, 2014. “A Connected World is Just the Beginning,” Retrieved 10 October, 2014, from <http://www.ericsson.com/res/docs/2013/networked-society-1-pager.pdf>
- Ezzy, D. 2002. *Qualitative Analysis: Practice and Innovation*. Crows Nest, NSW: Allen and Unwin.
- Funtasz, J. 2012. “Canadian Middle Manager Experience with Mobile Email Technologies,” *Information, Communication and Society* (15:8), pp. 1217–1235.
- Gebauer, J., Shaw, M. J., and Gribbins, M. L. 2010. “Task-technology Fit for Mobile Information Systems,” *Journal of Information Technology* (25:3), pp. 259–272.
- Gold, M., and Mustafa, M. 2013. “‘Work Always Wins’: Client Colonisation, Time Management and the Anxieties of Connected Freelancers,” *New Technology, Work and Employment* (28:3), pp. 197–211.
- Guest, G. 2012. *Applied Thematic Analysis*, Thousand Oaks, CA: Sage.
- Van den Hooff, B. 2004. “Electronic Coordination and Collective Action: Use and Effects of Electronic Calendaring and Scheduling,” *Information and Management* (42:1), pp. 103–114.
- Kietzmann, J., Plangger, K., Eaton, B., Heilgenberg, K., Pitt, L., and Berthon, P. 2013. “Mobility at Work: A Typology of Mobile Communities of Practice and Contextual Ambidexterity,” *The Journal of Strategic Information Systems* (22:4), pp. 282–297.

- Koch, H., Gonzalez, E., and Leidner, D. 2012. "Bridging the Work/Social Divide: The Emotional Response to Organizational Social Networking Sites," *European Journal of Information Systems* (21:6), pp. 699–717.
- Lash, S. 2002. *Critique of Information*, London: Sage.
- Laurier, E. 2002. "The Region as a Socio-technical Accomplishment of Mobile Workers," In *Wireless World: Social and Interactional Aspects of the Mobile Age*, B. Brown, N. Green, and R. Harper (eds.), London: Springer, pp. 46–61.
- Leavy, P. 2011. *Oral history: Understanding qualitative research*, New York, NY: Oxford University Press.
- Licoppe, C. 2010. "The 'Crisis of the Summons': A Transformation in the Pragmatics of 'Notifications,' from Phone Rings to Instant Messaging," *The Information Society* (26:4), pp. 288–302.
- MacCormick, J. S., and Dery, K. F. 2008. "Too Much of a Good Thing? BlackBerry use Changing the Terms of Engagement," In *22nd Australian and New Zealand Academy of Management (ANZAM) Conference*, pp. 1–11.
- MacCormick, J. S., Dery, K., and Kolb, D. G. 2012. "Engaged or Just Connected? Smartphones and Employee Engagement," *Organizational Dynamics* (41:3), pp. 194–201.
- Mazmanian, M., Yates, J., and Orlikowski, W. 2006. "Ubiquitous Email: Individual Experiences and Organizational Consequences of Blackberry Use," In *Academy of Management Proceedings*, Atlanta.
- Orlikowski, W. J. 2007. "Sociomaterial Practices: Exploring Technology at Work," *Organization Studies* (28:9), pp. 1435-1448.
- Orlikowski, W. J., and Scott, S. V. 2008. "Sociomateriality: Challenging the Separation of Technology, Work and Organization," *The Academy of Management Annals* (2:1), pp. 433-474.
- Orlikowski, W. J., and Scott, S. V. 2013. "Knowledge Eclipse: Producing Sociomaterial Reconfigurations in the Hospitality Sector," in *How Matter Matters: Objects, Artifacts, and Materiality in Organization Studies*, P. R. Carlile, D. Nicolini, A. Langley, and H. Tsoukas (eds.), Oxford, UK: Oxford University Press, pp. 119-141.
- Reinsch, N. L., Turner, J. W., and Tinsley, C. H. 2008. "Multicommunicating: A Practice Whose Time Has Come?," *The Academy of Management Review* (33:2), pp. 391–403.
- Rennecker, J., and Godwin, L. 2005. "Delays and Interruptions: A Self-Perpetuating Paradox of Communication Technology Use," *Information and Organization* (15:3), pp. 247–266.
- Richardson, K., and Benbunan-Fich, R. 2011. "Examining the Antecedents of Work Connectivity Behavior During Non-work Time," *Information and Organization* (21:3), pp. 142–160.
- Sarker, S., Xiao, X., Sarker, S., and Ahuja, M. K. 2012. "Managing Employees' Use of Mobile Technologies to Minimize Work/Life Balance Impacts," *MIS Quarterly Executive* (11:4), pp. 1–15.
- Sawyer, S., Allen, J. P., and Lee, H. 2003. "Broadband and Mobile Opportunities: A Socio-technical Perspective," *Journal of Information Technology* (18:2), pp. 121–136.
- Shen, Z., Lyytinen, K., and Yoo, Y. 2014. "Time and Information Technology in Teams: A Review of Empirical Research and Future Research Directions," *European Journal of Information Systems*, (in press).
- Sherry, J., and Salvador, T. 2002. "Running and Grimacing: The Struggle for Balance in Mobile Work," In *Wireless World: Social and Interactional Aspects of the Mobile Age*, B. Brown, N. Green, and R. Harper (eds.), London: Springer, pp. 108–120.
- Sorensen, C. 2011. *Enterprise Mobility: Tiny Technology with Global Impact on Work*, Basingstoke: Palgrave Macmillan.
- Stephens, K. K. 2012. "Multiple Conversations During Organizational Meetings: Development of the Multi-communicating Scale," *Management Communication Quarterly* (26:2), pp. 195–223.
- Turner, J. W., and Reinsch, N. L. 2010. "Successful and Unsuccessful Multicommunication Episodes: Engaging in Dialogue or Juggling Messages?," *Information Systems Frontiers* (12:3), pp. 277–285.
- Wajcman, J., and Rose, E. 2011. "Constant Connectivity: Rethinking Interruptions at Work," *Organization Studies* (32:7), pp. 941–961.

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