States of connectivity: New questions and new directions

By: Darl G. Kolb, Arran Caza, and Paul D. Collins

Abstract:

A recent article in *Organization Studies* used in its title the term 'constant connectivity'. Though we commonly think of connectivity as 'constant', temporal intermittency and actor agency make connectivity seldom, if ever, constant. Reflecting on studies of connectivity highlights the growing importance of recognizing and defining 'states' of connectivity. Several states of connectivity are reviewed, namely: hypo-connectivity, hyper-connectivity, requisite and optimal connectivity ('flow'). As an organizational resource, understanding various states of connectivity is critical to future research. More empirical work is needed to determine how the volume of connectivity makes a difference to performance and other outcomes.

Article:

Introduction

A recent article in this journal reported a study of knowledge workers in a contemporary office setting, with the title, 'Constant connectivity: Rethinking interruptions at work' (Wajcman & Rose, 2011). The authors investigated how participants interpreted multiple modes of mediated communication, which were 'constantly' available and required for their work. Contrary to the early literature and recent popular discourse on 'interruptions' at work (e.g. Carr, 2010; Powers, 2010), these authors suggest that, rather than seeing frequent calls for attention as distractions from work, such episodes are more accurately viewed as the *normal* sociomaterial (Orlikowski & Scott, 2008) world of knowledge workers, who 'inhabit an environment where communication technologies are ubiquitous, presenting simultaneous, multiple and ever-present calls on their attention' (Wajcman & Rose, 2011, p. 941). To their credit, these researchers are challenging existing notions of what is normal versus abnormal (interruptions) in contemporary work contexts that are characterized by increasing levels and pervasiveness of connectivity.

The authors are also to be credited for demonstrating that connectivity has become a fundamental element of contemporary work. Most work cannot be properly understood without considering the role of mediated communication in its execution. Wajcman and Rose (2011) thus illustrate the necessity of paying more attention to defining what we mean by terms such as 'constant connectivity' and, by extension, the increasing importance of considering more thoroughly the

various *states* of connectivity that characterize work and organizational contexts. States of connectivity reflect 'how much' connectivity exists in a setting. As with other resources – say, for example, money – simply noting that one has connectivity or not is generally less informative than determining how much of the resource (i.e. money or connectivity) one has at a given point in time. The aim of this Research Note is to clarify and reiterate the importance of considering the extent of connectivity present in a given context. Specifically, this Research Note draws from existing literature to nominate several states of connectivity as a way to address the increasingly important question of 'how much' connectivity is present in a given situation. Since connectivity influences productivity, job satisfaction, employee engagement and other aspects of individual, team and organizational performance, it is important to recognize and understand its relative influence at various levels.

'Constant' Connectivity?

In their article, Wajcman and Rose (2011) refer to states of so-called 'constant' and 'ubiquitous' connectivity. Their sample of telecommunications managers appear to have spent most of the day in their personal work areas, which were equipped with a networked computer, a landline telephone and a mobile phone. Therefore, when observed during regular office hours, these participants experienced what was described as 'constant connectivity'. While the label of constancy may seem a reasonable description of those managers' connectivity, it is somewhat problematic to generalize their situation to knowledge workers in general, many of whom rely primarily on mobile devices and are often mobile themselves. While mobile connectivity does promise, and sometimes deliver, constant contact (Castells, Fernandez-Ardevol, Qiu, & Sey, 2007), or at least the perception of being constantly engaged with work (MacCormick, Dery, & Kolb, in press), there are nonetheless important mitigating factors that limit the occurrence of truly constant connectivity.

The first limiting factor is that there is always some degree of 'temporal intermittency' (Kolb, 2008, p. 129) to prevent a state of constant connectivity. Temporal intermittency occurs any time that connections are time-delayed (i.e. asynchronous), as a result of factors such as time zone differences, time lags (e.g. slow Internet, transportation delays) and temporal patterns or structures (i.e. shiftwork vs 24/7 response). Indeed, in the study mentioned, the authors highlight the 'time shifting functionality' (p. 943) of many connective media, which allowed their participants to respond to communications in their own time.

The second factor that limits the frequency of truly constant connectivity is the attribute of 'actor agency' in relation to connectivity (Kolb, 2008, p. 129). Actor agency refers to the level of choice, control or 'free will' that contemporary workers have over their connectivity states (Cousins & Robey, 2005; Emirbayer & Mische, 1998). Indeed, one of Wajcman and Rose's key findings was that participants exerted control in deciding the order of their work tasks. Having the agency to determine the timing and sequence in which they addressed messages prevented them from feeling overwhelmed or intimidated by the volume of communication on their screens. Even in highly structured work settings, individuals' decisions about when and how to connect are influenced by personal communication practices and social dimensions of connectivity, such as interpersonal trust, social ties and a collaborative culture that allow individuals more or less freedom (agency) (Collins & Kolb, 2012). Of course, individuals may

choose to be in near-constant contact with others, but many, if not most, moderate 'constant' connectivity with intentional breaks or gaps, which may be routine (e.g. no email after midnight) or spontaneous (e.g. letting a phone call ring through to voicemail). Implicit in Wajcman and Rose's findings is the conclusion that just as 'interruptions' are *normal* in mediated work, so too are agentic acts of disconnection, which preclude so-called constant connectivity. In place of the relatively rare state of constant connectivity, several other, more theoretically and practically useful states of connectivity help us ask new questions.

Threshold State: Requisite Connectivity

Evidence shows that most work is now at least partially mediated by communication technologies (Dixon & Panteli, 2010; Martins, Gilson, & Maynard, 2004), and in such contexts work can only begin when a sufficient threshold of connectivity is achieved. For the discussion that follows, connectivity may be defined as:

> the mechanisms, processes, systems and relationships that link individuals and collectives (e.g. groups, organizations, cultures, societies) by facilitating material, informational and/or social exchange. It includes geo-physical (e.g. space, time and location), technological (e.g. information technologies and their applications) as well as social interactions and artefacts. (Kolb, 2008, p. 128)

Given this definition, *requisite connectivity* refers to a threshold state of having an appropriate level of connectivity, one which enables effective performance of a given task or social outcome (Kolb, Collins, & Lind, 2008). Requisite connectivity is a middle ground and can be distinguished from states of too little or too much connectivity.

At the one extreme is a state of *hypo-connectivity*, where there is insufficient connectivity for the demands of the situation. For example, in distributed teams when teleconferencing facilities are not available, and/or time differences and geographical distance make face-to-face contact problematic, a team may report suffering from hypo-connectivity. The other extreme is a state of *hyper-connectivity*, in which high levels of connectivity are detrimental to performance. Despite evidence that some workers are comfortable amid high levels of connectivity and information flow, it has nonetheless been shown that, beyond a certain threshold, connectivity leads to distraction, ineffectiveness and burnout (Atchley, 2010; Carr, 2010; MacCormick et al., in press). As such, effective and efficient performance requires that individuals, teams and organizations achieve and maintain a state of requisite connectivity, while avoiding the pitfalls of the two counterproductive states of hypo-connectivity and hyper-connectivity.

Optimal State: Connective Flow

Wajcman and Rose suggest that knowledge workers who successfully deal with the steady stream of connective media might ultimately experience 'flow' (Csikszentmihalyi, 1990) at work. *Connective flow* has been defined as the state 'where communication is highly effective and highly efficient and balanced in accordance with our needs and the demands of the task or situation at hand' (Kolb et al., 2008, p. 183). Indeed, since many knowledge workers take for granted high levels of connectivity as 'normal' in their day-to-day work, they are likely to find

themselves in a zone of fluid responsiveness (Rodriguez-Sanchez, Schaufeli, Salanova, & Cifre, 2008; Wajcman & Rose, 2011). So, an optimal state of connectivity can be said to exist, even if it may be brief or fleeting.

The notion of an optimal connective state may lead us to enact more or less social or technical connectivity or disconnections in order to achieve that fine balance that feels 'just right' for us. This underscores the growing awareness that the nature of connectivity lies in the eye of the beholder. Like anything subject to human meaning-making, our connective beliefs and behaviours may be highly idiosyncratic, symbolic, self-contradictory and even paradoxical. For example, Barley and colleagues (2011) have found that the volume of email one receives comes to symbolize one's overall workload or overload. As actors in our work environment, we choose to engage in many types of overwork behaviours, but email has come to symbolize work that has become out of control, i.e. we describe how busy we are by the number of emails waiting for us. Similarly, a study of bankers' smartphone usage found love–hate relationships full of contradictions, i.e. loving the flexibility the device affords, while wishing it might be stolen so the user could get a break from work (MacCormick et al., in press). Alternatively, Wilson and colleagues have described the 'paradox of distance' (2008), wherein one can feel 'close' to others who are far away and vice versa. In sum, as optimal states of connectivity become the holy grail of technology users, accordingly this state – how it looks, feels and how it is achieved – is likely to capture the attention and imagination of researchers in the future.

New Directions in Connectivity Research

Connectivity is more than a metaphor for organization (Angwin & Vaara, 2005; Kolb, 2008). It has become a phenomenon of contemporary organizational life (Wajcman & Rose, 2011), occurring on multiple dimensions, with particular attributes and a constant duality of connects and disconnects (Kolb, 2008). That duality means that states of connectivity are seldom constant, but always important. We believe more attention should be paid to the variety of states of connectivity in and around organizations. Returning to the resource metaphor introduced earlier, it is hard to imagine research simply investigating whether an organization has money, but not bothering to ask how much money there is, or the pattern of money coming or going. If connectivity is here to stay as a resource for organizational health and productivity, we need to be able to characterize states and patterns of connectivity. To that end, this Research Note has identified several states of connectivity that represent the quantum (how much) of social, technical or sociomaterial connections between individuals, and/or within teams and organizations. States of connectivity are important because they help us address and understand the impact of too much or too little connectivity on performance and productivity. They can also lead the way for a better understanding of how to balance what may feel like 'constant' connectivity with competing cognitive demands, including increased focus on tasks, deep reflective thinking and/or being *present* and giving attention to others.

If how much connectivity we have is important to know, how will we *know* it? Some measures of connective states do exist. Hypo-connectivity, hyper-connectivity, social and technical connectivity and connective choice (agency) scales have been developed and used to assess connectivity levels in relation to team innovation outcomes (Collins & Kolb, 2012), but there is a need for continued development of the metrics within this field of research. And, more studies

are needed to understand the way in which individuals and groups cope and manage the extreme states of anywhere/anytime computing or cases of extreme isolation, including why, when and how people exercise human agency to disconnect (Dery & MacCormick, 2011; Kolb & Collins, 2011). More empirical research is now needed in order to answer the crucial question of how certain states influence or determine productivity and other outcomes. For example, to what extent does hypo-connectivity impede effectiveness in teams? To what extent does hyper-connectivity reduce efficiency? And, what are the contingencies that determine optimal connectivity?

Besides more empirical investigation of these states, there is a need for more conceptual development in the wider domain of connectivity studies. Wajcman and Rose (2011) are on the right track in their attempt to counter-interpret 'interruptions' at work. Indeed, more in-depth fieldwork is necessary to understand the myriad of sociomaterial methods of coping, adapting and excelling within all states of connectivity. We have outlined several states of connectivity, but are there other states yet to be identified? Are there nuanced substates and conditions that will contribute to our understanding of more precisely when and how connectivity matters? Surely we must develop new ways of thinking about connective states of work as smartphone technology becomes the standard for both business and personal communication. Accordingly, where and how will individuals construct boundaries in an increasingly connected world?

While social and technical connections have underpinned organization for as long as humans have been organizing, we have reached a new edge of the frontier where more and more people can be more connected than ever before in history. This overarching state of connectivity leads us to ask new questions. We used to ask which media were best for certain tasks (Daft & Lengel, 1986; Kraut, Fussell, Brennan, & Seigel, 2002; Rice, 1992). While the 'which' question is still important, we must now ask the question: 'how much' connectivity do we need? For example, how do the rate, nature and volume of multiple types of connectivity affect productivity (e.g. effectiveness and efficiency), performance (such as innovation, creativity and collaboration), motivation (engagement vs burnout) and other meaningful outcomes for individuals, teams and organizations? An increased focus on states of connectivity will lead us in new directions of research and have useful practical implications for those seeking the right amount of connectivity.

Funding

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