Exchange

A Environment and Planning

Environment and Planning A
0(0) 1–11

DOI: 10.1177/0308518X17743507
journals.sagepub.com/home/epn

SAGE

From being there to being aware: Confronting geographical and sociological imaginations of copresence

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Abstract
In economic geography, the notion of copresence has been at the very center of the research agenda for decades. The elaboration of the benefits of colocation and physical proximity was (and still is) a chief aim of the disciplinary project to demonstrate that "geography matters". The geographical concern with colocation, proximity and distance, in fact, resonates with the sociological discourse on copresence. And yet, the relationship between copresence and its (distant) geographical relatives has rarely been explicated in a systematic fashion. By drawing on the seminal contributions by Goffman, Giddens and Knorr Cetina, amongst others, this account confronts the geographical conceptions of colocation, proximity and distance with sociological perceptions of copresence. By advancing from copresence as "being there" to copresence as "being aware" we seek to push beyond the prevailing physical perceptions of copresence towards a more socially constructivist understanding that accounts for the simultaneity and mutual conditioning of diverse modes of copresence and absence.

Keywords
Colocation, copresence, interaction, proximity

Introduction

In the field of economic geography, the notion of copresence – albeit often disguised under different labels – has been at the very center of the research agenda for decades.

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The (economic) benefits of colocation and physical proximity still are the irrefutable proof that ''geography matters'' (Gertler, 2008: 203). In turn, the concept of distance, as well as centrifugal dynamics of all sorts, are often treated as a threat to the relevance of geographical analysis and the discipline's identity as, for example, the ritualistic repudiation of the ''death of distance''-thesis (e.g. Cairncross, 2001) reveals. Evidence of the unabated importance of colocation and proximity has in particular been mobilized to confound the ''world is flat''-perspective (Friedman, 2005) according to which globalization erases the significance of geographical particularities and differentiating distances.

The geographical concern with colocation, proximity and distance actually resonates with the sociological discourse on copresence. And yet, the relationship between copresence and its (distant) geographical relatives has rarely been explicated in a systematic fashion. Studying copresence was originally the domain of (micro-)sociological theories of interaction. Initiating the scholarly engagement in sociology, Goffman (1963) referred to copresence as face-to-face interaction in shared physical space as the basic unit of sociological analysis. Goffman (1963) hence positioned copresence firmly within social theory as the medium through which micro-macro influences are accomplished. Situated social interaction of collocated actors, as a key tenet of interactionism asserts, is instrumental for (re-)producing larger social systems (Goffman, 1963). The debates on temporary clusters (e.g. Maskell et al., 2006) or field-configuring events (Lange et al., 2014; Schüßler et al., 2015), for instance, elucidate how temporally and spatially bounded gatherings shape institutional change or the structuring of markets.

The rather essentialist conception of copresence by Goffman (1963), however, increasingly became subject of differentiations. Copresence, as Giddens (1991) maintained, can also occur without sharing the same physical space – as long as actors share a perception of mutual entrainment. Such reciprocal perception can also be achieved when individuals are physically distant and interacting over the phone, for example. The proliferation of virtual interaction, of course, has given rise to ever more refined notions of copresence (for an overview see e.g. Zhao and Elesh, 2008): copresence can also occur between physically distant actors in virtual environments such as virtual labs or collaboration rooms (Campos-Castillo, 2012; Grabher and Maintz, 2007) as well as between actors and technological artefacts (Zhao, 2003) and virtually transmitted on-screen projections (Knorr Cetina, 2009).

Given the sustained (sociological) interest in copresence and the (geographical) absorption with the spatialities of eminent economic processes such as creativity, innovation and learning, as well as calls for a systematic exploration of the specificities of physical and virtual interaction (Slavich and Svejenova, 2016), we seek to advance a richer conceptualization of copresence that can theoretically inform research on how specific spatio-temporal contexts contain, mediate or complicate interaction (Lawrence and Dover, 2015). Our endeavor draws on the pertinent debates of copresence in sociology and on the extensive research on colocation, proximity and distance in economic geography (with a particular focus on creativity, innovation and learning; see, for instance, Boschma, 2005; Torre and Rallet, 2014).

We proceed as follows. First, we will examine and differentiate the geographical notions of colocation, proximity and distance. Second, we juxtapose the classical sociological *copresence-as-context* perspective with the more elaborate *copresence-as-perception* approach. Finally, we seek to push beyond the prevailing physical perceptions of copresence towards a more socially constructivist understanding that accounts for the simultaneity and mutual conditioning of diverse modes of copresence and absence.[1]

Copresence and its geographical relatives: Colocation, proximity and distance

Colocation: Sharing the physical context

The exploration of colocation in economic geography refers back to Marshall's (1890) conceptualization of industrial districts that provided a theoretical linchpin for the discourse on "territorial innovation models" (Moulaert and Sekia, 2003) that are varyingly discussed as industrial districts, learning regions, regional innovation systems or, most generically, as clusters. Despite differences with regard to geographical scales and key conceptual angles, these territorial innovation models converge on three propositions.

First, colocation provides access to (regional) club resources like pools of specialized labor and subcontractors as well as dedicated infrastructures. Second, collocated organizations benefit from knowledge spillovers since, as Marshall (1890: 25) famously put it, "the mysteries of the trade... are in the air." Colocation facilitates the circulation of knowledge through labor mobility, inter-organizational collaboration and local knowledge repositories, like business associations, for example. Moreover, colocation of organizations undertaking similar activities yields observability (Malmberg and Maskell, 2002: 439). Instead of knowledge *in* firms, colocation thus helps to generate knowledge *about* firms that sets in train a sort of "collective benchmarking" (Brown and Duguid, 2000: 21). Third, (physically) "being there" (Gertler, 1995) traditionally (and rather problematically) is associated with embeddedness in a rich tissue of localized practices, norms, rules and cultures that have been conceptualized as local conventions (Storper and Salais, 1997). Conventions, on a general level, shape the collective identities of economic actors and their modes of interaction (Storper, 1993). More specifically, conventions tip the balance from contract-based towards trust-based transactions; from closed to open learning systems; and from stripping collective assets to the joint production of local relational resources. The *locus operandi,* in short, conditions the *modus operandi*.

Proximity: From the physical to the relational and temporal

Whereas colocation mostly is treated in a dichotomous fashion (i.e. colocation *vs*. non-colocation), the notion of proximity has been transformed into an ever more differentiated layering of various dimensions. Proximity is no longer reduced to an exactly quantifiable distance between two geographical positions in (Euclidian) space (Torre and Rallet, 2005). Rather proximity has increasingly been construed in social terms that either correspond with, complement, or at least partially substitute geographical proximity. Building upon Boschma's (2005) typology, Hansen (2015) differentiates four additional types of proximity that are much more ambiguous than the apparently exactly measurable (Euclidian) geographical proximity. *Cognitive proximity* refers to similarities in the knowledge base and expertise of actors that influences the ability to learn from each other (Nooteboom, 2000); *organizational proximity* pertains to the extent to which relations are shared in intra- or inter-organizational arrangements and involves the degree of autonomy and control. *Social proximity* refers to the strength of social ties between agents at the micro-level resulting from friendship, family relations or previous work-related interactions in the sense of Granovetter's (1985) relational embeddedness. Finally, the notion of *institutional proximity* designates the extent of shared norms, habits, rules and laws between economic agents (Hansen, 2015: 1674).

With the increasing appreciation of spatial and social mobility of people, ideas and artifacts (see, e.g., Urry, 2002, 2003) and the projectification of work and organization

(see, e.g., Grabher, 2002; Lundin et al., 2015), proximity, in addition, increasingly has been perceived as a temporary rather than a permanent state of affairs. Various modes of temporary copresence, ranging from brief meetings in the course of corporate travel (Faulconbridge et al., 2009), industry conferences (Dobusch and Schüßler, 2014) or trade fairs (Bathelt and Schuldt, 2010) over temporarily gathered project teams (Grabher and Ibert, 2012) to long-term research stays (Torre and Rallet, 2005) are employed to create knowledge along ever more complex spatio-temporal trajectories.

Distance: Merely the absence of proximity?

The long-lasting fixation (if not obsession) of economic geography with the crucial importance of (literally) ''being there'' has increasingly been confronted with research that extended the geographical focus from proximity to distance, and from the local to the global (Amin and Cohendet, 2004). The respective work posits that physically distanced relations and inter-organizational ''global pipelines'' provide critical conduits for processes of knowledge production by supplementing and complementing ''local buzz'' (Bathelt et al., 2004). In addition, the Internet has given rise to new forms of mainly informal collaboration in spatially fragmented and socially distanced constellations of practitioners that reaches far beyond agglomerations of co-located organizations (Amin and Roberts, 2008; Gertler, 2008). And yet, the notion of distance is mostly addressed in an indirect fashion: regarded as a *lack of proximity* (Ibert, 2010), distance is perceived as a state of deficiency and inferiority bereft, by definition, of all the economic benefits associated with proximity (Bathelt and Turi, 2011).

A more recent strand of inquiry into the geographies of knowledge generation (Amin and Roberts, 2008; Gertler, 2008), however, seeks to appreciate both proximity and distance as geographical categories of equal epistemological status. In their research on the globally dispersed settings of virtual (user) communities, Grabher and Ibert (2014), for instance, demonstrate that interaction across distance can be meaningful if actors share similar material environments (such as laboratory equipment, for example). The *similarity*, rather than the *proximity* of material ''constellations of practice'' (Faulconbridge, 2010) affords a meaningful *in situ* validation, exploration and variation of virtually shared knowledge. Moreover, distinct features of online interaction such as the quasi-anonymity of actors that acts as a social leveler, asynchronicity of interaction, and easy access to hypertextual virtual memories (Gulbrandson and Just, 2011: 1099) provide additional capacities and increasingly unique opportunities for collaboration, cumulative learning and ''reflective reframing'' (Hargadon and Bechky, 2006).

In the distanced and dispersed setting of virtual communities, misunderstandings and misapprehensions might remain undetected for longer periods of time (Song et al., 2007). However, whereas ambivalence and misunderstandings usually are perceived as undesired distortions, both *can* unfold generative dynamics (Fortwengel et al., 2017; Grabher and Ibert, 2014: 26). By overcompensating the absence of sensory clues with verbal explication, contextualization and mutual confirmation (Olsen and Olsen, 2003), community members might reveal the taken-for-granted aspects of everyday solutions by explicating knowledge that otherwise might remain unconscious and tacit. Explication invites a problematization, further exploration and de-contextualization of practices. Communication under conditions of equivocality, then, triggers generative moments of incompleteness (Garud et al., 2008): creative dynamics might occur not *despite* but *because* of misunderstandings (Stark, 2009: 193).

Sociological conceptions of copresence: Copresence as context and as perception

Copresence as context: Being there

Goffman, emblematically, perceived copresence through the analytical lens of encounters. Goffman's (1963) "sociology of occasions" focuses almost exclusively on face-to-face interactions ("small behavior") of individuals that are copresent and therefore are "accessible, available, and subject to one another" (Goffman, 1963: 22). Considering the time of his writings, interactions in a shared *physical* space, unsurprisingly, are at the very core of Goffman's micro-sociology. Copresence, in his understanding, signifies reciprocal influence of individuals in immediate physical presence that frames the formation of meaning and order in social life.

Building on Goffman's perception of copresence, Giddens (2009: 28) aimed at appreciating the meso/macro-sociological level of the "institutional background of daily life" in his practice theory. Giddens (1984: xxiv) explicitly sought to systematically enrich Goffman's conception by placing more importance on the structure and time-space ordering that shape the "positioning" of the body in copresence. Giddens stresses that all interaction is situated within time and space, considering copresence itself as a context, a milieu of encounter and interaction. Giddens conceded the mediated interaction via the telephone some of the intimacies of (physical) copresence, but, like Goffman, he basically restricted copresence to encounters in shared physical space: "'full conditions of copresence' exist only in unmediated contact between those who are physically present" (1984: 68).

Yet, the rapid diffusion of new communication and information technologies engendered an increasing simultaneity and hybridization of physical (face-to-face) and virtual (mediated) interaction that have long challenged this physical comprehension of copresence (Houbon, 2016). In their ethnographic studies of financial markets, Knorr Cetina and Bruegger (2002), for example, conceptualize the simultaneity of physical copresence and virtual interaction at a distance as "global microstructures" that are micro-social in character, but global in reach. "Embodied presence" in face-to-face situations on the local trading floor and virtual "response presence" across the global network of computer terminals mutually condition each other in real time (Knorr Cetina and Bruegger, 2002: 909): "Embodied presence corresponds to the face-to-face situation, while response presence corresponds to situations in which participants are capable of responding to one another and common objects in real time without being physically present in the same place". Knorr Cetina (2009) hence emphatically demonstrates that pure physical (face-to-face) copresence – like in the perspective of Goffman (1963) and Giddens (2009) – can no longer be perceived as the primary unit of analysis for interactions.

Copresence as perception: Being aware

Very much in line with Knorr Cetina, Zhao and Elesh (2008: 566) argue that copresence is first and foremost a function of mutual awareness of each other, rendering people "mutually accessible for contact" in both online and offline environments. Copresence, in their view, is not restricted to a "naked" sense perception (i.e. the principal availability of sensory clues) of actors who are physically close to each other, but rather an active and mutual orientation towards one another. Coworkers intensively collaborating across distance via electronic media, for example, might be closer to each other in terms of mutual awareness, accessibility and availability than colleagues who are simply sharing the same office space. Advancing further into the realm of virtual communication, Zhao (2003) developed a

taxonomy in which copresence is understood "as mode of being with others" and "as sense of being with others" (Zhao, 2003: 445).

Campos-Castillo and Hitlin (2013) further extend traditional notions of copresence (restricted to face-to-face encounters) by alluding to imaginary interaction (e.g. prayer) and parasocial interactions like a Facebook-post or listening to the radio (Schiappa et al., 2007). Campos-Castillo and Hitlin (2013) offer a model of copresence that is less contextual but more an "intra-individual variable" with one actor perceiving entrainment with another, with "the other" not necessarily being human. According to Campos-Castillo and Hitlin (2013), copresence, as a subjective perception, is a dimensional category: (perceived) copresence can rise or decrease depending on situational constraints such as the amount of exchangeable cues (e.g. less in mediated interaction), the cognitive capacity of the actor (e.g. avoiding mutual gaze can free cognitive capacity), the actor's status (e.g. more attention to an higher status actor in a group), and on the sharing of social identities (e.g. more attention to in-group over out-group views).

Summary: Living in the synthetic situation

The geographical concern with colocation, proximity and distance/absence, indeed, seems to resonate with sociological notions of copresence: *colocation* is construed in a straightforward physical sense of immediate vicinity and therein bears resemblance to the *copresence-as-context* perspective; the perception of different social, organizational and institutional dimensions of proximity (Hansen, 2015) is akin to the sociological *copresence-as-perception* perspective (Campos-Castillo and Hitlin, 2013); and finally, distance is not simply the absence of proximity, but an interaction context *sui generis* (Grabher and Ibert, 2014).

Quite obviously, virtual interaction has dramatically increased in geographical and socio-demographic reach as well as in informational depth (Houbon, 2016; Knorr Cetina, 2009). Not only the binary understanding of physical copresence of "being there" (or not being there), but even the simple juxtaposition of physical and virtual interaction seems no longer adequate. The increasing simultaneity and amalgamation of presence/absence and physical/virtual mounts to what Knorr Cetina (2009) refers to as "synthetic situations". Synthetic situations "include electronically transmitted on-screen projections that add informational depth and new response requirements to the "ecological huddle" (Goffman, 1964: 135) of the natural situation" (Knorr Cetina, 2009: 61): two or more actors are virtually present to each other (response present) while each actor is in his or her own physical environment (embodied present). The synthetic situation describes a novel kind of copresence in which the physical setting (physical copresence) and the virtual on-screen projection (virtual copresence) mutually condition each other. The synthetic situation, in fact, has turned into the emblematic socio-spatial condition of today.

Synthetic situations can neither be apprehended with the traditional geographical notion of colocation, nor with the concepts of proximity and distance: colocation is confined to contexts of (permanent) physical vicinity; and although the concept of proximity overcomes the limitation of a purely physical conception of spatialities, relations are mostly perceived in terms of a single dimension of proximity (i.e. individual actors and organizations are either cognitively *or* organizationally *or* institutionally *or* socially close). The simultaneity and, importantly, mutual conditioning of various dimensions of proximities and distances that epitomize synthetic situations, so far, has not been explored in terms of established geographical registers (for an important exception, see Ibert and Müller, 2015). We are, of course, not insinuating to discard these established geographical notions altogether.

However, particularly research on micro-practices (of creativity, innovation and learning, for example) might significantly benefit from an enrichment of geographical imaginations of ''being there'' (i.e. sharing the same physical space with other actors) with sociological perspectives on ''being aware'' (i.e. the perception of mutual entrainment among actors).

Implications: Researching the synthetic situation

The simultaneous interaction through various online and offline media that are emblematic of synthetic situations not only challenges the established conceptual register of geography, but also poses formidable methodological challenges. How can the entanglement and mutual conditioning of physical and virtual copresence empirically be captured in sufficient detail, let alone be interpreted with regard to the relative contribution of online/offline interactions to processes of creativity, innovation and learning, for example? To elucidate the methodological challenges of synthetic situations, we refer to a typical situation in pharmaceutical research (derived from our in-depth empirical fieldwork).

Figure 1 illustrates the multiple modes of interaction in the laboratory from the perspective of one person, with the dashed lines representing a ''being there'' and the stars representing an active, mutual ''being aware''. Being there is restricted to the physical space of the laboratory, in other words embodied presence. Response presence refers to the interactions via phone, email or Skype. For both forms of presence mutual awareness is the condition for interaction in copresence. To illustrate the entanglement and mutual conditioning of physical and virtual modes of copresence, we highlight critical situations at different points in time in a pharma research laboratory.

The face-to-face situation unfolds at around 10 am and takes place in the shared office space where one researcher performs his analysis in front of his computer. To get a second opinion on a theoretical puzzle he was grappling with, he extended his awareness to capture the expertise present in the shared office space and, consequently, asked a colleague for help. The colleague then joined the researcher to sit down in front of the same computer screen.

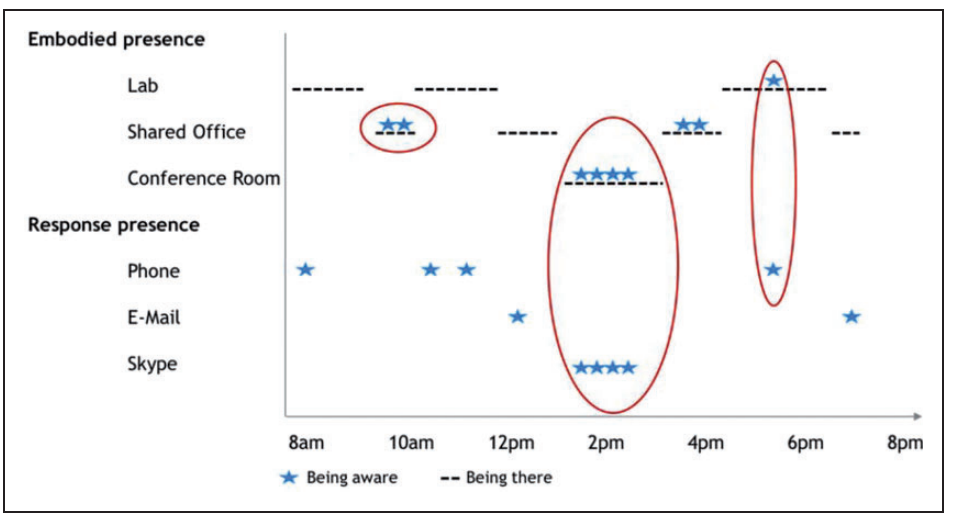

Figure 1. Modes of interaction in a pharma research laboratory (oscillating between ''being there'' and ''being aware'').

While they are discussing the findings, the images and graphics visible on the computer screen were actively referred to in the discussion several times.

The first synthetic situation occurred in the context of a Skype conference. Several researchers were gathering in the conference room, while other researchers were virtually present through the video on-screen projection. The virtual copresence and, at the same time, triangulation of information through physical copresence implies that awareness permanently shifted between the virtual and the physical realm. The second synthetic situation occurred when two researchers spoke to each other over the phone. While talking, the researcher in the lab was asked to share certain information with other actors in the lab and to look up some notes in the lab book. The awareness of the researcher in the lab, hence, moved back and forth between the phone call, the other physically present actor, and the lab book as a material artefact.

This stylized example derived from our field work suggests at least three methodological implications. First, the challenge to explore the intricate entanglement of offline and online interaction dynamics drastically reveals the limitations of traditional methodological strategies that are limited to data collection at a single site at a single point in time. The methodological challenge is no less than to follow and to meaningfully interpret the flow of interaction sequences across multiple natural and synthetic situations through *process-oriented* and *multi-site* research (see, e.g., Hautala, 2017). A respective research design requires a degree of granularity that allows to capture the dynamics of interaction sequences in which, for example, parameters of an experiment are first discussed in a skype-conference, subsequently the experiment is performed in a specific lab and finally the findings are distributed via email.

Second, synthetic situations can hardly be unpacked by a single method, but call for a *mixed-method* approach that allows to triangulate findings from different analytical strategies. The method of choice in (qualitative) economic geography, the expert interview, might be instrumental for gauging the overall affinity of actors to employ certain media for specific purposes (like, for instance, using skype-conferences for the discussion of weakly structured problems or instant messaging for responding to simple requests). For the precise empirical assessment of synthetic situations, however, expert interviews are only of limited value due to the difficulties to reconstruct the ''ecological huddle'' (Goffman, 1964: 135) of the complex online/offline interactive dynamics ex post. The ''microscopic investigation'' (Knorr Cetina, 1983: 136) of social interactions in synthetic situations, in addition, calls for meticulous ethnographic research as well as netnographic approaches that allow to trace the social dynamics of online interactions (see, e.g., Grabher and Ibert, 2014). Ethnographies and netnographies could also provide critical insights into the conditions under which actors deliberately retreat from copresence into a state of absence, whether in the physical or virtual realm.

Third, the exploration of synthetic situations might benefit from an extension of Hägerstrand's *time-geographic* framework (Thrift, 1977) that incorporates opportunities and constraints of the virtual realm. The affordances of virtual media suspend the traditional ''coupling constraints'' (Hägerstrand, 1970) of physical copresence for synchronous interaction by opening up multiple opportunities for asynchronous exchange (and, hence, for temporary absence). And yet, virtual interaction is not simply to be equated with a liberation from coupling constraints. Rather, interaction through virtual media, whether synchronous or asynchronous, imposes new coupling constraints imposed by the imperatives of having access to certain technologies. An updated version of Hägerstrand's framework, then, might provide a further toolkit to explore the ambiguities of synthetic situations.

Acknowledgements

We thank Oliver Ibert for useful comments during the development of this paper.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note

1. This conceptual piece has been developed in the context of the multidisciplinary research group "Organized Creativity. Practices for Inducing and Coping with Uncertainty" funded by the German Research Foundation (DFG FOR 2161).

References

Amin A and Cohendet P (2004) *Architectures of Knowledge: Firms, Capabilities, and Communities*. Oxford: Oxford University Press.

Amin A and Roberts J (2008) Knowing in action: Beyond communities of practice. *Research Policy* 37: 353–369.

Bathelt H, Malmberg A and Maskell P (2004) Cluster and knowledge: Local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography* 28(1): 31–56.

Bathelt H and Schuldt N (2010) International trade fairs and global buzz. Part I: Ecology of global buzz. *European Planning Studies* 18(12): 1957–1974.

Bathelt H and Turi P (2011) Local, global and virtual buzz: The importance of face-to-face contact in economic interaction and possibilities to go beyond. *Geoforum* 42: 520–529.

Boschma R (2005) Proximity and innovation: A critical assessment. *Regional Studies* 39(1): 61–74.

Brown JS and Duguid P (2000) Mysteries of the region: Knowledge dynamics in Silicon Valley. In: Lee C-M, Miller WF, Hancock MG, et al. (eds) *The Silicon Valley Edge. A Habitat for Innovation and Entrepreneurship*. Stanford: Stanford University Press, pp. 16–39.

Cairncross F (2001) *The Death of Distance: How the Communications Revolution is Changing Our Lives*. Boston: Harvard Business School Press.

Campos-Castillo C (2012) Copresence in virtual environments. *Sociology Compass* 6(5): 425–433.

Campos-Castillo C and Hitlin S (2013) Copresence: Revisiting a building block for social interaction theories. *Sociology Theory* 31(2): 168–192.

Dobusch L and Schüßler E (2014) Copyright reform and business model innovation: Regulatory propaganda at German music industry conferences. *Technological Forecasting and Social Change* 83: 24–39.

Faulconbridge J (2010) Global architects: Learning and innovation through communities and constellations of practice. *Environment and Planning A* 42: 2842–2858.

Faulconbridge JR, Beaverstock JV, Derudder B, et al. (2009) Corporate ecologies of business travel in professional service firms: Working towards a research agenda. *European Urban and Regional Research* 16(3): 295–308.

Fortwengel J, Schüßler E and Sydow J (2017) Studying organizational creativity as process: Fluidity or duality? *Creativity and Innovation Management* 26(1): 5–16.

Friedman TL (2005) *The World is Flat: A Brief History of the Twenty-First Century*. New York: Farrar, Straus and Giroux.

Garud R, Jain S and Tuertscher P (2008) Incomplete by design and designing for incompleteness. *Organization Studies* 29: 351–371.

Gertler MS (1995) ''Being There'': Proximity, organization, and culture in the development and adoption of advanced manufacturing technologies. *Economic Geography* 71(1): 1–26.

Gertler M (2008) Buzz without being there? Communities of practice in context. In: Amin A and Roberts S (eds) *Community, Economic Creativity and Organization*. Oxford: Oxford University Press, pp. 203–226.

Giddens A (1984) *The Constitution of Society: Outline of the Theory of Structuration*. Berkeley and Los Angeles: University of California Press.

Giddens A (1991) *Modernity and Self-Identity. Self and Society in the Late Modern Age*. Cambridge, MA: Polity.

Giddens A (2009) *Sociology*, 6th ed. Cambridge: Polity.

Goffman E (1963) *Behavior in Public Places*. New York: Free Press.

Goffman E (1964) The neglected situation. *American Anthropologist* 66: 133–136.

Grabher G (2002) Cool projects, boring institutions: Temporary collaboration in social context. *Regional Studies, Special Issue* 36(3): 213–222.

Grabher G and Ibert O (2012) Project ecologies: A contextual view on temporary organizations. In: Morris P, Pinto J and Söderlund J (eds) *Oxford Handbook on Project Management*. Oxford: Oxford University Press, pp. 175–201.

Grabher G and Ibert O (2014) Distance as asset? Knowledge collaboration in hybrid virtual communities. *Journal of Economic Geography* 14(1): 97–123.

Grabher G and Maintz J (2007) Learning in personal networks: Collaborative knowledge production in virtual forums. In: Hof H and Wengenroth U (eds) *Innovation Research: Concepts, Methods, and Perspectives*. Münster: LIT, pp. 187–202.

Granovetter M (1985) Economic action and social structure. The problem of embeddedness. *American Journal of Sociology* 91: 481–510.

Gulbrandson IT and Just SN (2011) The collaborative paradigm: Towards an invitational and participatory concept of online communication. *Media, Culture & Society* 33(7): 1095–1108.

Hägerstrand T (1970) What about people in regional science? *Papers of the Regional Science Association* 1(24): 7–21.

Hansen T (2015) Substitution or overlap? The relationship between geographical and non-spatial proximity dimensions in collaborative innovation projects. *Regional Studies* 49(10): 1672–1684.

Hargadon AB and Bechky BA (2006) When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science* 17: 484–500.

Hautala J (2017) Now together, next apart: Knowledge creation processes through repeated geographical dispersion. *Geografiska Annaler: Series B, Human Geography* 99(3): 1–24. DOI: http://dx.doi.org/10.1080/04353684.2017.1375383.

Houbon D (2016) Von Ko-Präsenz zu Ko-Referenz – Das Erbe Erving Goffmans im Zeitalter digitalisierter Interaktion. Working Paper, Institut für Soziologie, RWTH Aachen.

Ibert O (2010) Relational distance: Sociocultural and time-spatial tensions in innovation practices. *Environment and Planning A* 42: 187–204.

Ibert O and Müller FC (2015) Network dynamics in constellations of cultural differences: Relational distance in innovation processes in legal services and biotechnology. *Research Policy* 44(1): 181–194.

Knorr Cetina K (2009) The synthetic situation: Interactionism for a global world. *Symbolic Interaction* 32(2): 61–87.

Knorr Cetina KD (1983) The ethnographic study of scientific work: Towards a constructivist interpretation of science. In: Knorr Cetina K and Mulkay M (eds) *Science Observed: Perspectives on the Social Study of Science*. London: Sage, pp. 115–140.

Knorr Cetina K and Bruegger U (2002) The virtual societies of financial markets. *American Journal of Sociology* 107(4): 905–950.

Lange B, Power D and Suwala L (2014) Geographies of field-configuring events. *Zeitschrift für Wirtschaftsgeographie* 58(1): 187–201.

Lawrence TB and Dover G (2015) Place and institutional work: Creating housing for the hard-to-house. *Administrative Science Quarterly* 60(3): 371–410.

Lundin R, Arvidsson N, Brady T, et al. (2015) *Managing and Working in Project Society – Institutional Challenges of Temporary Organizations*. Cambridge: Cambridge University Press.

Malmberg A and Maskell P (2002) The elusive concept of localization economies: Towards a knowledge-based theory of spatial clustering. *Environment and Planning A* 34: 429–449.

Marshall A (1890) *Principles of Economics*. London: Macmillan.

Maskell P, Bathelt H and Malmberg A (2006) Building global knowledge pipelines: The role of temporary clusters. *European Planning Studies* 14(8): 997–1013.

Moulaert F and Sekia F (2003) Territorial innovation models: A critical survey. *Regional Studies* 37(3): 289–302.

Nooteboom B (2000) *Learning and Innovation in Organizations and Economies*. Oxford: Oxford University Press.

Olsen C and Olsen J (2003) Mitigating the effects of distance on collaborative intellectual work. *Economics of Innovation and New Technology* 12: 27–42.

Schiappa E, Allen M and Gregg PB (2007) Parasocial relationships and television: A meta-analysis of the effects. In: Preiss RW, Gayle BM, Burrell N, et al. (eds) *Mass Media Effects Research. Advances through Meta-Analysis*. New Jersey, NY: Lawrence Erlbaum, pp. 301–314.

Schüßler E, Grabher G and Müller-Seitz G (2015) Field-configuring events: Arenas for innovation and learning? *Industry & Innovation* 22(1): 165–172.

Slavich B and Svejenova S (2016) Managing creativity: A critical examination, synthesis and new frontiers. *European Management Review* 13(4): 237–250.

Song M, Berends H, van der Bij H, et al. (2007) The effects of IT and co-location on knowledge dissemination. *The Journal of Product Innovation Management* 24(1): 52–68.

Stark D (2009) *The Sense of Dissonance. Accounts of Worth in Economic Life*. Princeton: Princeton University Press.

Storper M (1993) Regional "Worlds" of production: Learning and innovation in the technology districts of France, Italy and the USA. *Regional Studies* 27(5): 433–455.

Storper M and Salais R (1997) *Worlds of Production. The Action Frameworks of the Economy*. Harvard: Harvard University Press.

Thrift N (1977) *An Introduction to Time Geography. Concepts and Techniques in Modern Geography No. 13*. London: Institute of British Geographers.

Torre A and Rallet A (2005) Proximity and localization. *Regional Studies* 39(1): 47–59.

Torre A and Rallet A (2014) *Regional Development and Proximity Relations*. Cheltenham: Edward Elgar.

Urry J (2002) Mobility and proximity. *Sociology* 36(2): 255–274.

Urry J (2003) Social networks, travel and talk. *British Journal of Sociology* 54(2): 155–175.

Zhao S (2003) Toward a taxonomy of copresence. *Presence* 12(5): 445–455.

Zhao S and Elesh D (2008) Copresence as 'being with' – Social contact in online public domains. *Information, Communication and Society* 11(4): 565–553.