Beyond proximities: The socio-spatial dynamics of knowledge creation

Roel Rutten
Tilburg University
School of Social and Behavioural Sciences
r.p.j.h.rutten@uvt.nl

Abstract
Knowledge creation is recognized as social interaction within social context, but geography of knowledge creation research inadequately connects social context to physical place. On the one hand, the territorial innovation models conflate social context and physical place; on the other hand, the proximities approach reduces physical place to near-far dichotomies. However, proximities are outcomes of social interaction rather than inputs for knowledge creation and the development of proximities between agents may be highly geographically embedded. This paper introduces the concept of ‘conversations’ to move the debate on the geography of knowledge creation forward. Conversations are social spaces where knowledge creation happens; they capture the ongoing, purposive knowledge creation in professional networks and communities of practice. As social spaces conversations are not intrinsically connected to physical place and agents from multiple locations may engage in conversations, making them carriers of global knowledge. The connection of conversations (social space) to physical place depends on distance dynamics (effort required to bridge distance for knowledge creation) and on place dynamics (the attractiveness of a place for knowledge creation). Using these dynamics the paper develops a typology of the geography of conversations that explains how conversations may be anchored in multiple locations and how the ‘social dynamics’ of conversations (norms, values, trust, social capital) may be interwoven with place dynamics through spatially sticky agents. The notion of conversations thus offers a way of understanding the geography of knowledge creation that goes beyond existing views.

Jelcodes: R11, O31
BEYOND PROXIMITIES: THE SOCIO-SPATIAL DYNAMICS OF KNOWLEDGE CREATION

Abstract
Knowledge creation is recognized as social interaction within social context, but geography of knowledge creation research inadequately connects social context to physical place. The proximities approach reduces physical place to near-far dichotomies and territorial innovation models conflate social context and physical place. This paper introduces the concept of ‘conversations’ as social spaces where knowledge creation happens and develops typologies of how conversations connect to physical places based on the effort required to bridge distance and the attractiveness of places for knowledge creation. Addressing the socio-spatial dynamics of knowledge creation, the paper explains how conversations may be anchored in multiple locations.

Key words: knowledge creation, space, place, proximities, social interaction

JEL Classification: O18, O31, R11

Introduction
The debate on the geography of knowledge creation is conducted along at least two opposing views. On the one hand, territorial innovation models (TIMs) argue that the social and institutional characteristics of places affect knowledge creation. Although heavily criticized for spatial fetishism (Moulaert and Sekia 2003), the TIM literature’s suggestion that factors other than geographical proximity, such as norms, values, trust and social capital, affect knowledge creation is uncontested (Amin and Roberts 2008, Hassink and Klaerding 2012, Lorenzen 2008). The issue is that these other factors are not necessarily place specific. This has inspired the proximities approach, which commonly identifies geographical, social, institutional, cognitive and organizational proximity (Boschma 2005, Mattes 2012). Proximities facilitate knowledge creation by reducing uncertainty and resolving coordination problems when agents are proximate on at least one form of proximity (Boschma 2005, Knoben and Oerlemans 2006). Non-geographical proximities enable knowledge creation over distance even when the knowledge involved is tacit (Gertler 2003). The proximities approach sees nothing intrinsically spatial about knowledge creation, although co-presence and co-location may generate local knowledge spillovers. Furthermore, trade-offs can be made between the various proximities so that maximizing or optimizing one form of proximity may compensate distance on other forms (Boschma 2005, Mattes 2012). However, a satisfactory answer to how the different forms of proximity are related, or how they may substitute one another, is missing (Gertler 2003, Torre and Wallet 2014). Moreover, the notion that non-geographical proximities may substitute geographical proximity puts this approach in the ‘death-of-distance’ camp (Amin and Cohendet 2004), which Morgan (2004) has accused of conflating spatial reach and social depth.

Morgan (2004) demonstrates that the social and geographical contexts of knowledge creation are more intimately connected than the near-far dichotomy of geographical distance of the proximities approach admits (Grandadam et al. 2013, Hassink and Klaerding 2012). Moreover, social context combines social, institutional, cognitive and organizational proximities which
suggests that proximities are not available separately and that, consequently, no trade-offs can be made between them (Howells 2012, Lorenzen 2008). What is missing from both the TIM literature and the proximities approach is a satisfactory way of connecting the social and spatial contexts of knowledge creation (Gertler 2003, Healy and Morgan 2012). In response, this paper introduces the notion of ‘conversations’ as social spaces where knowledge creation takes place and where knowledge creation is affected by a range of ‘social dynamics’, such as norms, values, trust and social capital (Amin and Roberts 2008, Gertler 2003). Connecting conversations (social space) to physical place builds a socio-spatial explanation of knowledge creation that helps the debate forward by connecting the proximities approaches’ understanding that geographical proximity is not necessary for knowledge creation and the TIM literature’s understanding that knowledge creation is socially embedded. The paper builds this argument through the following sections. The first section takes some time to discuss knowledge creation as a process of social interaction, as a necessary background against which the socio-spatial context of knowledge creation can be explained. In the second section the notion of conversations is introduced. The third section criticizes the proximities approach and explains that geographical proximity has both a distance and a place element. This section further explains how social space and physical place are connected. Sections four and five develop typologies connecting conversations to social space and physical place respectively and suggest that conversations may be ‘anchored’ in multiple places simultaneously. A summary and conclusion follows in the final section.

Knowledge and knowledge creation

A fundamental notion in the discourse on knowledge is its tacitness. Popularized by Polanyi’s observation that “we know more than we can tell” (Polanyi 1966, in Gertler 2003: 77), tacitness implies that knowledge exchange may be hampered by the limitations of spoken and written language and by the fact that knowledge is connected to the human and social context from which it originated (Gertler 2003). On the other side of the continuum from tacit knowledge is codified or explicit knowledge. The key difference being that tacit knowledge cannot be codified via artefacts such as language, figures, graphs and metaphors (Gertler 2003, Grant 1996, Howells 2012, Tsoukas 2009). The widespread use of the tacit-codified knowledge typology has perverted into the erroneous belief that, since it can be formalized, codified knowledge is also decontextualized knowledge (Howells 2012). But that ignores Polanyi’s understanding of tacit knowledge and goes against the fundamentally personal and contextualized nature of knowledge. To Polanyi, codified knowledge is also contextualized and absorbing it requires socialization. This is because the artefacts formalizing codified knowledge are themselves a contextualized body of knowledge (Gertler 2003, Howells 2012, Tsoukas 2009). Another key misconception that follows from perceiving codified knowledge as decontextualized is the idea that knowledge can be disconnected from individuals. Fundamentally, knowledge is personal because the experiences, interpretations and meanings that create knowledge are personal. But at the same time individual knowledge is highly interrelated with and interdependent on the knowledge of other individuals because experiences, interpretations and meanings are shaped through social interaction (Amin and

While it may be useful to talk about tacit and codified knowledge, for example when discussing appropriation concerns of innovating firms, the contextualized nature of knowledge is its most important characteristic. It means that knowledge creation happens in 'social spaces', such as professional and social networks (Uzzi 1997), in communities of practice and epistemic communities (Amin and Roberts 2008), and in intra and inter-organizational teams (Amin and Cohendet 2004). Knowledge creation in social space shapes and is shaped by trust and social capital, by norms and values, and by conventions, habits and routines (Amin and Cohendet 2004, Hassink and Klaerding 2012, Malecki 2012, Morgan 2004, Tsoukas 2009). These and other 'social dynamics' perform two critical functions; they (1) build a shared frame of reference for experiences, interpretations and meanings (Amin and Roberts 2008, Nonaka and Von Krogh 2009) and they (2) make the behaviour of agents predictable (Amin and Cohendet 2004, Uzzi 1997). Although not a household term in economic geography, 'social dynamics' are widely recognized as critical factors enabling or constraining knowledge creation and innovation. They feature for example as untraded interdependencies in interactions between agents (Storper 1997), as glue and lubricant in relations (Malecki 2012), and as institutional thickness in innovative milieus (Gertler 2010). The ‘relational turn’ in economic geography, which takes agents and their relations as object of analysis, has further strengthened interest in ‘social dynamics’ and their effect on social interaction (Bathelt and Glückler 2003, Lagendijk and Pijpers 2013, Shearmur 2011). In fact, ‘social dynamics’ may explain more accurately than proximities how agents reduce uncertainty and overcome coordination problems. ‘Social dynamics’ may be seen as the mechanisms that build relations between agents and, in turn, agents develop ‘social dynamics’ in their relations (Amin and Roberts 2008). This contrasts with the largely static interpretation of proximities as relational states between which trade-offs can be made (Mattes 2012).

The individual nature of knowledge offers an opportunity to more carefully distinguish between individual and organizational knowledge creation. Organizational knowledge creation is formal, organized, goal-directed and managed (Grant 1996, Nonaka and Von Krogh 2009, Tsoukas 2009). It is aimed specifically at developing innovations such as new technologies, new products, new services and new processes. For this purpose, organizational knowledge creation connects individual knowledge creation to organizational resources, such as finance, equipment and managerial capabilities (Amin and Cohendet 2004, Nonaka and Von Krogh 2009). We can call this firm innovation. Individual knowledge creation is more informal and cuts across organizational boundaries. Its social space is networks and communities rather than (inter-)organizational teams. Knowledge creation can be purposive or serendipitous (Amin and Roberts 2008) and results in new knowledge; though not in innovations because it is unconnected to organizational resources. Firms use this newly created knowledge as input for their innovation processes. While innovation is affected by organizational social dynamics, knowledge creation is affected by the social dynamics of professional networks and
communities of practice, which are less pervasive and more diffuse (Amin and Cohendet 2004, Hassink and Klaerding 2012).

From a social interaction perspective, purposive (intentional) and serendipitous (accidental) knowledge creation are different kinds of knowledge creation. People intentionally come together for purposive knowledge creation, often physically (Healy and Morgan 2012), while accidental knowledge creation is a by-product of purposive knowledge creation and of social interaction in general. When individuals accidentally meet in social space or physical place they interact, share experiences and hence create knowledge. Although undirected, this kind of knowledge creation can nonetheless generate valuable new ideas and establish connections for intentional knowledge creation later on. In the economic geography literature, accidental knowledge creation is often referred to as (local) buzz (Batbelt et al. 2004, Storper and Venables 2004), with much discussion focusing on how local or global buzz is. While knowledge is local because of the fact that it is individual and individuals are spatially sticky to the place where they live and work (Healy and Morgan 2012, Howells 2012), knowledge creation is not local because social interaction happens across geographical space (Grandadam et al. 2013, Shearmur 2011). Nor are social spaces necessarily connected to any specific geographical place (Amin and Cohendet 2004). Accordingly, there is nothing intrinsically local about buzz, or knowledge creation in general (Boschma 2005). However, buzz may be the by-product of co-location or co-presence (Storper and Venables 2004) of individuals who are not intentionally in the same place. It is the difference between accidental knowledge creation that happens between individuals meeting at conferences, where they intentionally went to, and knowledge creation between individuals who happen to meet in public places, such as campus restaurants or cultural performances (Florida 2002). From a ‘social dynamics’ perspective, the difference between the two is that accidental knowledge creation at conferences is subject to the social dynamics of the community or professional network that organizes them, while accidental knowledge creation in public places lacks such a clear social context. Moreover, at conferences and in communities of practice and professional networks, accidental knowledge creation is part of an on-going discourse; accidental knowledge creation in public places is incidental in nature. Florida (2002) makes a case for local buzz, i.e. accidental knowledge creation in public places, where he argues that co-location of creative individuals from different and unrelated backgrounds builds a conducive environment for knowledge creation. Also mainstream literature suggests that local knowledge spillovers happen between unrelated agents (Boschma 2005).

It is possible then to identify different forms of knowledge creation based on two different dimensions: intentional versus accidental and on-going versus incidental. While this identifies four possible forms of knowledge creation only three are of concern here because the combination of intentional and incidental suggests a form of organized knowledge creation that lacks the informality and bottom-up nature that this paper focuses on (Figure 1.) The other forms are conversations, which are a key element of this paper’s argument and are explained in detail below, and buzz and local buzz. The difference between buzz and local buzz is that the latter follows from individual interaction between individuals who (temporarily) share a
physical place, while the former is part of an on-going discourse that may be conducted over distance in social space.

![Figure 1: Forms of knowledge creation](image)

**Conversations, buzz and local buzz**

Conversations conceptualize the intentional and on-going knowledge creation between individuals as informal, bottom-up and distributed social interaction. Economic geography increasingly recognizes the importance of informal and personal interaction because their unstructured and distributed nature allows firms to tap into a wider range of globally dispersed knowledge, in addition to formal inter-firm innovation networks that often focus on creating specific knowledge (Hassink and Klaerding 2012, Lorenzen 2008). The concept of conversations bridges individual knowledge creation and firm innovation because it addresses how informal, unstructured knowledge creation between individuals contributes to organized knowledge creation (innovation) in firms.

Engagement in conversations is fluid and informal and cuts across organizations, and it is affected by a variety of social dynamics that are native to the individuals involved and their networks and communities. Conversations are conducted by knowledge workers from a variety of professional backgrounds, such as researchers and practitioners, using a range of media; from face-to-face communication to technology mediated interaction (Amin and Cohendet 2004, Amin and Roberts 2008). Being social spaces conversations are not connected to a single place and individuals from multiple locations engage in them (Crevoisier and Jeannerat 2009). Conversations are aimed at creating knowledge in various fields of technology and application. They contribute to the body of global knowledge that can be more or less freely absorbed by firms to feed their innovation processes. For example, there is a conversation on renewables in the field of energy, on the spatial dimension of knowledge creation in the field of economic
geography, and in the field of human resource management there is a conversation on empowerment. Although producing globally distributed knowledge, conversations are fragmented as smaller groups of people focus on specific questions and problems (Howells 2012). For example, there is a focus on solar energy within the conversation on renewables and a focus on leadership within the conversation on empowerment. The boundaries between these ‘sub-conversations’ and the broader conversation are fluid because individuals and knowledge can move freely between them. The boundaries between different conversations are fluid in similar ways which allows a conversation on spatial planning to benefit from conversations on architecture and urban development. Although unconnected to a specific location, conversations may be localized when individuals physically cluster around specific problems and challenges, such as at conferences, on temporary bases, and more permanently in research centres. The localization of conversations follows from the continued importance of face-to-face communication for complex interactions (Healy and Morgan 2012, Howells 2012) but it does not exclude individuals from other locations to engage in ‘localized’ conversations (Crevoisier and Jeannerat 2009, Lorenzen 2008, Shearmur 2011).

The step from conversations (individual knowledge creation) to firm innovation can be explained as firms bringing together specialist knowledge workers in an organized process of knowledge creation to develop innovations (Grant 1996, Nonaka and Von Krogh 2009, Tsoukas 2009). Organized knowledge creation is fuelled by inputs from various conversations that organizational members engage in. For example, the development of smartphones taps into conversations on digitization, mobile communication, ergonomics and design. However, different smartphone producers have used the knowledge from these conversations to develop different, firm-specific smartphones. The idea of firms tapping into conversations connects to Grandadam et al.’s (2013) notion of the ‘middleground’. The middleground connects individuals (underground) to firms, organizations and research centres (upperground). It is where people meet in not-so-organized ways. “The communities of the middleground form particular repositories of creative skills that are not explicitly controlled or owned by firms, but widely contribute to drive and influence trajectories of creation” (Grandadam et al. 2013: 1703). However, contrary to conversations, the argument of Grandadam et al. (2013) is explicitly linked to places, to creative cities. The underground, for example, is defined as “the concentration of skilled individuals ... which are not immediately linked to the commercial and industrial world, but play an important role in generating innovations and spillovers” (ibid: 1702). This argument points at a critical connection between physical place and social space and the middleground, as an intermediate level between the formal upperground of organizations and the informal underground of communities, is a useful way of thinking about how individual knowledge creation contributes to firm innovation (Gertler 2003, Howells 2012, Morgan 2004). However, communities and professional networks where conversations, i.e. purposive knowledge creation, happen are not a-priori defined as territorial. In fact, their spatial dynamics are increasingly understood as being more complex (Crevoisier and Jeannerat 2009, Hassink and Klaerding 2012, Healy and Morgan 2012, Shearmur 2011). Moreover, the notion of the middleground does not distinguish between intentional and accidental knowledge creation.
Another important characteristic of conversations is that they produce buzz. The various definitions of buzz in the literature agree that buzz is unstructured, informal interaction between individuals who happen to share a social space. That is, buzz results from ‘being there’, in social space or as temporary co-presence or as permanent co-location in geographical place. The literature further agrees that that buzz encourages knowledge creation and innovation by allowing individuals to exchange complex ideas and build new personal relations (Bathelt and Schulte 2010, Storper and Venables 2004, Torre 2008). The discussion in the literature focuses on the extent to which buzz is local, global, or even virtual (Bathelt and Schulte 2010, Storper and Venables 2004). This paper considers buzz a by-product of conversations since the conversation is why individuals meet; hence the social and spatial dynamics of buzz follow those of conversations.

That is different for local buzz. While buzz requires an element of socialization (Bathelt et al. 2004, Storper 2013), which suggests social relations, it is also unplanned, serendipitous and results from just ‘being there’ (Bathelt et al. 2004, Storper 2013). This suggests that buzz may also happen between individuals who are unrelated. In fact, that is the reasoning behind the ‘urban externalities’ introduced by Jacobs (1961) and elaborated by, among others, Florida (2002) and Storper (2013). Urban externalities suggests cities as centres of loose ties and economic and social diversity (Florida 2002) that attract creative people and encourage them to interact, exchange ideas and create knowledge by providing attractive and diverse places where these individuals can meet (Florida 2002, Lee et al. 2004, Storper 2013). This argument is actually very similar to Grandadam et al.’s (2013) middleground, which connects creative processes (i.e. knowledge creation, buzz) to cities in the following way: “what is essential for the creative process to become effective is that the creative city be equipped with a valuable set of places and spaces enabling the production and diffusion of knowledge assets throughout the different layers of the local milieu ... Places and spaces ... contribute to [bridging] the creative, artistic and cultural industries, on one side, and the individual working in related occupations, on the other side”(Grandadam et al. 2013: 1702). Consequently, a certain amount of buzz results from interactions between co-present and co-located individuals going about their daily business. This we call local buzz and the amount of local buzz in a place depends on what Florida (2002) calls the quality of a place. This has three elements: what is there (the authenticity and attractiveness of the built and natural environment), who is there (a diversity of people interacting and providing cues that everyone can plug into) and what is going on (the vibrancy of street life, café culture, arts and music) (Florida 2002: 232). The more diverse and dynamic the local environment, the more local buzz is likely to happen (Bathelt et al. 2004, Storper 2013). In turn, local buzz contributes to conversations by providing a “low-cost way for new ideas and talent to make their way into existing activities ... [and] lowering the cost of evaluation on the part of those already in the relevant loops” (Storper 2013: 181). Furthermore, while local buzz is a product of co-presence, co-location and the quality of a place, places that are characterized by high levels of local buzz often have strong global connections as well because “they are important nodes of ... international business and culture networks, with high levels of international travel-and-meet activity” (Storper 2013: 181) (Bathelt and Shuldt 2010, Healy and Morgan 2012).
The notion of local buzz and its connection to place quality is important because it shows that social space and geographical place together shape knowledge creation. Quality of place encourages knowledge creation through local buzz and so affects knowledge creation in conversations. This underlines that the spatial dimension of knowledge creation is not only about ‘being there’ but also about ‘being where’ (Crevoisier and Jeannerat 2009, Grandadam et al. 2013, Morgan 2004, Shearmur 2011).

Proximities

The proximities approach identifies non-geographical forms of proximity to explain knowledge creation over distance (Gertler 2003). All forms of proximity “reduce uncertainty ... resolve the problem of coordination and thus facilitate interactive learning and innovation” (Boschma 2005: 62). Several studies have investigated the various forms of proximity but substantial ambiguity on their definitions remains (Knoben and Oerlemans 2006). Torre and Rallet (2005) distinguish between geographical and organized proximity. Geographical proximity they define simply as distance. Organized proximity is a function of organizations that is built around a logic of belonging and/or similarity and enables organizations to make their members interact. Boschma (2005) distinguishes five forms of proximity: geographical, cognitive, organizational, social and institutional proximity. He too simplifies geographical proximity as being ‘near’ or ‘far’ to other agents. Cognitive proximity refers to overlapping knowledge bases of agents; organizational proximity concerns a history of relations between organizations; social proximity is a micro-level phenomenon that considers friendship and kinship ties; and institutional proximity is a macro-level phenomenon that pertains to shared norms, values, habits and routines (Boschma 2005). Boschma acknowledges that organizational, social and institutional proximity are strongly interconnected and consequently argues that social proximity (micro or individual level) and institutional proximity (macro level) affect knowledge creation in similar ways. Also Knoben and Oerlemans (2006) discuss proximity on the level of organizations. They define four main forms of proximity: geographical proximity (distance), cultural proximity (national, regional and organizational culture), technological proximity (shared tools, devices and knowledge), and organizational proximity. Because of its high level of conceptual ambiguity they break down organizational proximity into three sub forms: cognitive proximity (similarities in actors’ perception, interpretation and understanding of the world), social proximity (personal relations), and institutional proximity (shared norms, rules and procedures).

A recent contribution to the proximities approach comes from (Mattes 2012), who argues that innovation requires a balancing of heterogeneity and proximity. Innovation needs diversity but to benefit from diversity firms have to be proximate on at least one dimension. Why proximity on only one dimension should suffice and whether all forms of proximity are equally potent facilitators of innovation are questions she avoids. Using Boschma’s (2005) five forms of proximity Mattes suggests that cognitive, institutional and organizational proximity are critical for learning, while geographical and social proximity are auxiliary factors. This is unconvincing because the social capital and embeddedness literatures have demonstrated that social proximity can be a very powerful force of its own by forging strong ties (Gertler 2003,
Granovetter 1985, Malecki 2012) while geographical proximity should be understood in a much broader way than a near-far dichotomy. Interactions between the various proximities certainly exist (Boschma 2005, Gertler 2003) but Mattes’ (2012) idea of balancing heterogeneity and proximity, by making ‘trade-offs’ between the various proximities, is problematic because it suggests that proximities are more or less static relational states that are available separately. However, proximities are more accurately seen as the outcome of a process of social interaction where they are constructed through social dynamics, i.e. shared norms, values, habits, routines, etc. Analytically, proximities may be identified separately but they are constructed simultaneously through social interaction and, in turn, affect social interaction in combination (Amin and Roberts 2008, Howells 2012).

In sum, this paper takes issue with the proximities approach for the following reasons. First, the proximities approach has a problematic, binary understanding of geography as near versus far (Shearmur 2011). This ignores TIM literature findings that explain why some places are better at knowledge creation than others. Geography is not only about ‘being there’ (Gertler 2003); ‘being where’ (i.e. place qualities) also matters (Healy and Morgan 2012). Second, the proximities approach conflates individuals and firms. While the proximities approach is primarily concerned with firm innovation, it frequently refers to individual-level interaction to build its case, particularly when explaining social and institutional proximity (Boschma 2005, Knoben and Oerlemans 2006). However, the social and spatial dynamics of firm innovation and individual knowledge creation may be very different (Hassink and Klaerding 2012, Grandadam et al. 2013, Lorenzen 2008). Third, the proximities approach mistakenly understands codified knowledge as de-contextualized in order to create an artificial separation between the social and geographical contexts of knowledge creation (Howells 2012, Morgan 2004). Finally, the proximities approach suggests proximities as static relational states but they are more accurately understood as being constructed through social interaction (Amin and Roberts 2008). In other words, proximities are not inputs for knowledge creation but outcomes of social interaction; which suggests that proximities are not the mechanism to reduce uncertainty and resolve coordination problems and that they are the wrong metaphor to understand the spatial dynamics of knowledge creation (Lagendijk and Pijpers 2013).

**Non-geographical proximities**

As social dynamics are responsible for reducing uncertainty and solving coordination problems, they must be the starting point of a discussion on the spatial dimension of knowledge creation. Social dynamics have various ‘origins’, such as the private sphere and inter-personal relations (e.g. norms and values), the institutional and cultural context (e.g. routines and conventions), or social networks (e.g. trust and social capital); however, on the level of social interaction between individuals it does not immediately matter where social dynamics come from. Individuals are simultaneously exposed to social dynamics from multiple origins, e.g. from social and professional networks and from the regional and national context. This reflects Granovetter’s (1985) embeddedness argument, which says that individuals are embedded in on-going systems of social relations that influence their behaviour. ‘System of social relations’ pertains to both the norms and values of the immediate social context and to social institutions (Granovetter 1985). Furthermore, Malecki’s (2012) argument that social capital acts as glue and
lubricant in relations pertains to other social dynamics as well. Focusing on social dynamics addresses the conceptual ambiguity and overlap between the proximities by bringing the social factors affecting interaction under one denominator. This has precedence in the literature; in a related discussion on institutions and regional economic change, Gertler (2010) defines institutions so broad as to include social, cultural and organizational proximity. He further argues that agents are embedded in multiple institutions rather than that they experience the effects of different institutions separately.

On the other hand, it makes sense to distinguish between micro-level and macro-level social dynamics. The former reflect the social dynamics of the networks and communities that individuals are part of and affect social interaction in a direct way. The latter pertain to social dynamics of regional and national society which affect social interaction in more subtle, indirect ways (Granovetter 1985). Particularly when networks and communities have clearly established (micro) social dynamics, their effect will be felt much stronger than societal social dynamics (Hassink and Klaerding 2012). This corresponds to Torre and Rallet’s (2005) observation that interaction is double embedded in social networks (micro social dynamics) and institutions (macro social dynamics). Micro and macro social dynamics may be argued to ‘cover’ Boschma’s (2005) social, institutional and cultural proximity. Organizational proximity does not pertain to individual interaction but is captured by micro social dynamics among colleagues. Cognitive proximity pertains to shared knowledge and skills but since knowledge is inseparably linked to social context and since knowledge creation involves a strong element of socialization, cognitive proximity is in fact very closely connected to (micro) social dynamics (Amin and Cohendet 2004, Howells 2012, Tsoukas 2009). In other words, all non-geographical proximities can be redefined in terms of micro and macro social dynamics.

**Geographical proximity**

The role of geographical proximity in knowledge creation is more complicated. On the one hand, knowledge creation does not need geographical proximity (Amin and Cohendet 2004, Gertler 2003); however, the continued importance of face-to-face communication remains undisputed (Howells 2012, Lorenzen 2008, Torre 2008). On the other hand, the quality of place makes that knowledge creation happens more in some places than in others (Florida 2002, Healy and Morgan 2012, Storper 2013). The first argument pertains to geographical distance; whether individuals will bridge distance for knowledge creation depends on the following considerations:

- Distance is more accurately expressed in terms of the effort required to bridge it, which explains why knowledge creation between (international) transport hubs is fairly uncomplicated (Healy and Morgan 2012).
- Knowledge creation is also related to preference and personal choice. Individuals who have developed a liking for each other are more likely to make an effort to bridge distance (Gertler 2003, Howells 2012).
- Dependency on and the spatial distribution of important contacts also affects individuals’ willingness to bridge distance (Shearmur 2011).
Geographical distance is thus more accurately seen as dynamic trade-off between effort, preference and dependency. This ‘distance dynamic’ explains to what extent bridging distance, i.e. ‘being there’, matters for knowledge creation.

The second argument, the quality of place (Florida 2002), boils down to the question why some places create more knowledge than others. While ‘traditional’ agglomeration advantages, such as connectivity and scale, play a role, they insufficiently discriminate between different types of regions (metropolitan, rural, manufacturing, high-tech). Nor do they explain why some smaller regions are good at knowledge creation (Storper 2013). Jacobian (Jacobs 1961 in Florida 2002) externalities, summarized by Florida (2002) as ‘what is there’, ‘who is there’ and ‘what is going on’ are more promising because they point to socio-cultural diversity (Lee et al. 2004) and the need for attractive amenities (Grandadam et al. 2013) for knowledge creation. Although not undisputed and with limited empirical support, socio-cultural diversity is increasingly recognized as an important source of new ideas and opportunities (Lee et al. 2004, Storper 2013, Adam and Westlund 2013). The argument is that creativity thrives on socio-cultural diversity because it encourages interactions and exchanges between people from many different backgrounds. Florida (2002) further argues that ‘economic and technological’ creativity and ‘cultural and artistic’ creativity reinforce each other because in their private lives individuals cross over between these spheres and turn a place into a vibrant community (Amin and Roberts 2008, Storper 2013). Socio-cultural diversity can thus be seen as a ‘place dynamic’. The meeting of physical place and social space in attractive amenities is another important place dynamic (Grandadam et al. 2013, Shearmur 2011). The continued importance of face-to-face communication for knowledge creation (Healy and Morgan 2012, Lorenzen 2008) results in a need for physical places around which networks and communities may converge, such as conference venues, research facilities and organizations (Howells 2012). ‘Cultural’ venues may be particularly important because they provide attractive and authentic places that knowledge workers enjoy visiting and that invite them to engage with one another (Florida 2002, Lee et al. 2004, Storper 2013). Place dynamics (socio-cultural diversity and attractive amenities) thus explain why it matters for knowledge creating individuals to be in some places rather than in others, i.e. ‘being where’ matters. It is important not to understand place dynamics as characteristics of a place but as dynamic elements shaping and being shaped by social interaction. Socio-cultural diversity does not necessarily produce creativity, nor do authentic amenities necessarily attract people. That depends on the extent to which the social space where knowledge creation happens connects to a particular physical place.

Place dynamics (socio-cultural diversity and amenities) connect to distance dynamics (effort, preference and dependency) because individuals are more likely to make an effort to connect to places of choice where they are likely to interact with interesting individuals. Instead of geographical proximity it is thus more accurate to speak of geographical dynamics (place and distance dynamics) when referring to the geographical dimension of knowledge creation. Geographical dynamics are dynamics not unlike social dynamics because they (1) bring people together and connect them and because they (2) shape and are shaped by the interactions between individuals.
Conversations and social dynamics

Social dynamics can make a social space a secure environment where individuals can exchange views and ideas without being constrained by concerns over malfeasance, appropriation and reputation (Amin and Cohendet 2004, Uzzi 1997). However, it is well-documented that knowledge creation suffers when relations become too close. Close relations crowd out diversity in terms of knowledge inputs (Bathelt et al. 2004, Uzzi 1997) and socially accepted practices (Amin and Roberts 2004, Malecki 2012); both are preconditions for creativity and knowledge creation (Florida 2002, Tsoukas 2009). In response, the proximities approach argues for optimum levels of proximity so as to avoid the problems of too little proximity (not enough common ground to sustain interactions) and too much proximity (Boschma 2005). In the social-dynamics language of this paper, ‘optimum distance’ may be rephrased as balancing weak and strong social dynamics, where weak and strong reflect diversity levels between individuals. Weak social dynamics describe situations where high levels of diversity, in terms of knowledge bases, norms, values, and low levels of trust and social capital, inhibit social interaction. Conversely, strong social dynamics coincide with low levels of diversity because the resulting overlap in knowledge bases, norms, values and high levels of trust and social capital encourage social interaction (Amin and Roberts 2008, Gertler 2010, Malecki 2012). Similar to the optimum-distance argument, moderate social dynamics balance diversity and homogeneity, and are therefore most conducive for knowledge creation (Howells 2012, Tsoukas 2009, Uzzi 1997).

In fact, moderate social dynamics define conversations because social spaces with weak or strong social dynamics are not conversations. Strong social dynamics make a social space closed and inward-looking so that social interaction in those spaces will not create (much) knowledge. Weak social dynamics make social spaces very open and enable a wide variety of individuals to enter. However, this openness comes at the expense of cohesion which is needed for knowledge creation. Individuals may use such open social spaces to hear new things rather than to create knowledge. Arguably, this is a typology and the boundaries between conversations
and other social spaces is fluid. Nor does it mean that knowledge creation cannot happen in other social spaces. Social dynamics can be used to identify those other social spaces and their relation to knowledge creation. As far as macro social dynamics are spatial, because they pertain to regional and national society (Howells 2012), strong macro social dynamics suggest social spaces that are relatively closed to individuals from other geographical places. Micro social dynamics pertain to networks and communities (Amin and Cohendet 2004), so strong micro social dynamics suggest strong ties within networks and communities making them relatively inaccessible. A combination of strong micro and strong macro social dynamics thus suggests local strong ties, whereas weak micro and weak macro social dynamics suggest very open social spaces that are unconnected to specific places; which could be called buzz. (See the above discussion on buzz.) The two remaining combinations could then be defined as local buzz (weak micro social dynamics, strong macro social dynamics) and non-local strong ties (weak macro social dynamics, strong micro social dynamics) (Figure 3). Of course, the boundaries between conversations and other social spaces are fluid and moderate social dynamics can still connect some conversations more closely to particular geographical places than others. But this typology offers a way of connecting social space and geographical place that goes beyond the flawed attempts of both the proximities approach and the TIM literature.

![Diagram: Conversations and social dynamics](image)

**Figure 3: Conversations and social dynamics**

**Conversations and geographical dynamics**

The previous section explained how social space (conversations) and physical place are connected, but not all conversations are connected to physical places equally strong. That follows from connecting conversations to geographical dynamics. Strong distance dynamics suggest that individuals are willing to bridge distance, in which case conversations are conducted across multiple geographical locations rather than in a single one (Lorenzen 2008). Strong place dynamics suggest that individuals are strongly connected to a specific place
(permanent or temporary) and benefit from its qualities (Florida 2002). Both distance and place dynamics may ‘anchor’ conversations to a specific place, for example when:
- A substantial number of individuals in a particular location engages in a conversation; which may result from spatial concentration of jobs in a particular field;
- Individuals from other places engage in the conversation through temporary proximity;
- The conversation benefits from local socio-cultural diversity;
- The conversation connects to other conversations in the place.
- The conversation converges in the amenities of the place.

Geographical ‘anchoring’ acknowledges that conversations are social spaces that are not necessarily connected to any particular place. However, since individuals are ‘spatially sticky’ and interact with their physical and socio-cultural environment, conversations become ‘anchored’. The geographical anchoring of conversations may take multiple forms, depending on how place and distance dynamics affect them (Figure 4).

**Figure 4: Geographical dynamics of conversations**

*Multi local anchored conversations* are anchored in multiple places (Crevoisier and Jeannerat 2009), although a limited number of places or they would be footloose conversations. These conversations shape and are shaped by local qualities of place, including research facilities and the knowledge bases of local firms; which may in fact be global, turning local firms into entry points for global knowledge (Lorenzen 2008, Shearmur 2011). The individuals engaged in these conversations are connected to global knowledge also through strong distance dynamics. Consequently, strong connections will exist between the various places where the conversation is anchored. Examples of these multi local anchored conversations are conversations on the genetics of aging or on composite materials in engineering. These are specialized conversations that have global reach but depend on expensive research facilities that are only available in a limited number of places.
**Single local anchored conversations** are anchored, ideal typically, in a single place while weak distance dynamics make that few individuals from other places engage in them. These conversations are highly specialized and revolve around local challenges and opportunities, making them less accessible for outsiders. Examples of these conversations may be conversations on aircraft design and manufacturing. Few firms in a limited number of places design and build aircraft but their innovations depend on conversations with many specialists from a large number of organizations. Although these conversations are linked to several broader conversations, on light materials and software for example, manufacturers take specific care to isolate design and manufacturing conversations from competitors.

**Geographically dispersed conversations** are characterized by weak place dynamics and strong distance dynamics. Individuals from many places engage in them but these conversations are not anchored to specific places, making them footloose. These conversations have wider importance and interest and they may produce sophisticated knowledge; however, they do not evolve around local amenities or 'spatially sticky' investments. Examples of such conversations are conversations on consumer psychology or urban traffic management.

**Geographically concentrated conversations** are specific to local problems, issues and challenges that are not immediately relevant for or dependent on people in other places, resulting in weak distance dynamics. Nor are these conversations closely connected to local quality of place, resulting in weak place dynamics. Such conversations may be rare and may not produce very sophisticated knowledge; for example, conversations on customer loyalty schemes of local business. Although such loyalty schemes exist in a many places little or no exchange happens between them.

Given the distributed nature of knowledge creation, multi local anchored and geographically dispersed conversations may be most common. This suggests that social and distance dynamics are more important than place dynamics (local factors) in affecting conversations, although place dynamics may be strongly interwoven with social and distance dynamics in some places. But the point is that this typology identifies a wider range of spatial configurations for knowledge creation than both the TIM literature and the proximities approach allow for.

**Summary and conclusion**

This paper delivered a framework for explaining the socio-spatial dynamics of knowledge creation. The framework is based on an understanding of knowledge creation as an informal and bottom-up process of social interaction between individuals, as opposed to organized knowledge creation or firm innovation. The focus on individual knowledge creation fills a gap in the economic geography literature, which is mainly concerned with firm innovation. The paper criticizes the proximities approach’s explanation of geographical (and other forms of) proximity, arguing that proximities are static relational states that are outcomes of rather than inputs for social interaction. It is more accurate to say that social dynamics (e.g. norms, values and social capital) rather than proximities reduce uncertainty and resolve coordination problems. Moreover, the proximities approach conflates individual knowledge creation and firm
innovation even though their social dynamics may differ considerably. Therefore, explaining the socio-spatial context of knowledge creation must begin with a proper understanding of knowledge creation. While knowledge creation always happens as part of social interaction between individuals, knowledge creation can be intentional (purposive) or accidental (serendipitous), and it can be on-going or incidental. This paper focuses on conversations as intentional, on-going knowledge creation between individuals. Conversations are social spaces in which individuals from multiple organizations engage, rather than networks or teams that they may be a member of. Conversations contribute to a body of global knowledge that firms tap into to fuel their innovation processes.

The socio-spatial dynamics of conversations (knowledge creation) follows from the fact that: (1) knowledge creation (conversations) is connected to social space and that (2) individuals are connected to physical place. Explaining the geography of knowledge creation thus requires connecting social space to physical place. This effort takes into account the actual qualities of place (place dynamics, being where) and the effort it requires to bridge distance (distance dynamics, being there). It leads to a typology of the geographical anchoring of conversations that goes beyond the simplistic near-far dichotomy of the proximities approach and the unrealistic notion of the death of distance, while avoiding the spatial fetishism of the TIM literature. Depending on the kind of knowledge that conversations create and the social dynamics affecting them, conversations may be geographically anchored or footloose and they may be conducted in a single or in multiple locations. Quality of place (place dynamics) such as the presence of firms and an attractive urban environment may connect individuals to places and thus anchor conversations. The need or wish to connect to certain individuals (distance dynamics) may achieve the same. Moreover, individuals from multiple locations can engage simultaneously in conversations. While social dynamics primarily belong to social space, social space may be connected to physical place through ‘spatially sticky’ individuals. Social dynamics may thus become part of the quality of place; which explains for example the creative atmosphere of some urban centres.

The approach outlined in this paper builds a dynamic explanation of the interaction between social space and physical place because it builds on knowledge creation as a social process that shapes and is shaped by social dynamics, distance dynamics and place dynamics. The approach is multi-disciplinary as it connects ‘social interaction’ from the knowledge creation and the communities of practice literatures to the ‘relational turn’ in economic geography. In addition, the approach offers a coherent account of knowledge creation from an individual perspective and explains how this connects to organized knowledge creation or firm innovation. The paper also emphasizes social dynamics as a means to explain how norms, values, social capital, etc. affect knowledge creation and its socio-spatial context. Arguing that social interaction is affected by multiple social dynamics simultaneously, the social dynamics approach avoids the pitfalls of both the TIM literature, which presents norms, values, social capital, etc. as stylized territorial artefacts, and the proximities approach, which argues that proximities are available separately.
The conversations-argument has important implications for understanding regional innovation. Regional innovation is a function of the number of conversations that local firms can tap into; both locally anchored conversations and conversations elsewhere that local firms can access. Differences in regional innovation follow from differences in the number of conversations that can be accessed rather than from local innovative milieu. The local mix of institutions, knowledge bases, attitudes to newness etc. that make up a milieu may contribute to the physical, digital and social accessibility of conversations for local firms. However, the causal mechanism explaining regional innovation is connected to conversations, not local milieu. In metropolitan regions, accessibility to conversations and local milieu are strongly interconnected. But innovation in non-metropolitan regions may depend much more on connectivity to metropolitan regions, where conversations can be accessed, than on local milieu. Moreover, conversations more often than not bridge multiple locations. Similar ideas from Lorenzen (2008) and Shearmur (2011) may have profound implications for regional innovation policy, which heavily emphasizes improving local milieu as a generic approach to encouraging innovation in less-favoured regions, but local milieu may not matter all that much for regional innovation in those regions.

References
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