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Personal and social proximity empowering collaborations: the glue of knowledge networks

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ABSTRACT

The proximity framework serves to analyse and understand how collaborations form and develop over time, and how these affect innovation and learning. The framework has inspired and informed empirical studies in several contexts, contributing to our understanding of the dynamics of dyadic collaborations, industrial clusters and districts, and regional innovation systems, to name but a few. Recent conceptual and empirical advances have called attention to the role of personal proximity and social proximity in such collaborations. In addition to other forms of proximity, these two dimensions could make up the glue that holds knowledge networks together. In the introduction to this special issue, we elaborate upon this proposition, setting out a point-of-departure for the three empirical studies collected in this issue. We summarize the findings of these papers, and develop a research agenda from those findings that may guide proximity researchers to novel research problems and useful research designs.

KEYWORDS



Proximity; personal proximity; social proximity; collaboration; innovation

JEL CODES

L14; O31; D71; D85

1. Proximity revisited: adding personal proximity to the mix

Proximity between partners is necessary for forming and maintaining collaborations (Mattes 2012). For a long time, the proximity framework was centred on geographical proximity (Belussi and Caldari 2009), but over time it has become clear that the framework should reflect that organisations can co-locate without interacting, and interact without being co-located (Knoben 2009). Consequently, the initial concept of geographical proximity has been extended to other dimensions, i.e. cognitive, organizational, institutional, and social proximity (Boschma, 2005). Moreover, it has become clear that one or a few kinds of proximity can compensate for, or substitute, other kinds of proximity (Hansen 2015; Huber 2012; Mattes 2012). The primary motives for partners to start collaborations are to be found in their cognitive and organizational proximity. Cognitive proximity captures the extent to which partners hold similar knowledge, in terms of technical language, ‘know-how’, and ‘know-what’ (e.g. Cunningham and Werker 2012; Huber 2012). In cognitive proximity, partners find opportunities for innovation by making combinations of their knowledge (Boschma, 2005). Organizational proximity

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captures similarity between partners in their organizational goals and organizational-level institutions (e.g. Werker, Ooms, and Caniëls 2016). In organizational proximity, partners find the relevant organizational synergies that help them to work together most easily and without much friction (e.g. Messeni Petruzzelli 2008). Notwithstanding the fact that cognitive proximity and organizational proximity drive collaboration, recent conceptual and empirical works (Caniëls, Kronenberg, and Werker 2014; Werker, Ooms, and Caniëls 2016) put forward the proposition that there is an important role for personal proximity and social proximity in collaborations as well. Collating findings from studies of the two concepts, we deduce that these two proximity dimensions may act as the glue of collaborations, as we will proceed to detail below. For this reason, the interest in social and personal proximity has grown in recent years.

Although personal and social proximity both capture the human factor in collaborations, and therefore have often been treated as the same concept (e.g. Knobens and Oerlemans 2006; Boschma, 2005), they do actually differ (Caniëls, Kronenberg, and Werker 2014; Werker, Ooms, and Caniëls 2016). Collaboration partners who are personally close, like each other, and therefore enjoy working together (Caniëls, Kronenberg, and Werker 2014). So, personal proximity affects collaborations on an individual level, because it inspires either 'clicks' or 'disclicks' between (potential) partners. In contrast, social proximity enables collaborations, because the (potential) partners belong to the same professional or social networks (Caniëls, Kronenberg, and Werker 2014). As these networks provide shared informal rules, e.g. common habits, and a shared socialization process, social proximity enables trust-based interactions between partners (e.g. Boschma, 2005).

Personal and social proximity have only been analysed as distinct variables in the last few years. However, at least three streams of literature have suggested that the human factor on an individual level, i.e. personal proximity, is crucial for collaborations and knowledge networks, and at the same time different from the human factor on a collective level, i.e. social proximity. First, empirical research on organizational behaviour suggests that professionals only collaborate with (potential) partners if they actively like those (potential) partners (Casciaro and Lobo 2008). At the same time, this research finds that the competence of the (potential) partners is virtually irrelevant. Hence, differences between potential partners on a personal level suffice as a motive not to tap into the relevant knowledge residing with these potential partners. This behaviour is observed in different organizational contexts and for different tasks (Casciaro and Lobo 2008). Second, in the investigations of regional innovation systems we find the distinction between individual agency and regional innovation system structure (Tödting and Trippel 2013; Suvinen 2014). Here, the literature argues that we understand regional innovation systems' structure, but need to come to grips with the impact of individual agents on these structures (Tödting and Trippel 2013). In other words, it is the interaction between individuals within organizations (managers, entrepreneurs, researchers, civil servants, etc.) that drives transformation of regional innovation systems. Third, relational economic geography points out the relevance of considering human factors on both the individual and the collective level (Rutten and Boekema 2012). Within this scope, a few studies have conceptualized and explored effects of personal proximity (Werker, Ooms, and Caniëls 2016; Ooms and Ebbekink 2015). Werker, Ooms, and Caniëls (2016) focused on dyadic collaborations at the individual level, using qualitative data. Their study's results inspired the proposition that personal proximity informs academics' decisions

to start collaborations with other academics (in case of proximity), as well as decisions to refrain from doing so (in case of distance), and proposed a facilitating role of personal proximity in coordinating and maintaining ongoing collaborations. Ooms and Ebbekink (2015) conducted a multiple-case study of three Dutch clusters, and identified a range of cluster governance issues and benefits associated with actors involved with clusters' governance having either little, moderate, or considerable personal proximity.

The aim of this special issue is to advance current understanding of the relationships between, and effects of, social and personal proximity, beyond conceptual and explorative understanding. In the following, we present the contribution of the three papers featured in this special issue. The first study in this special issue, investigates the relationship between personal and social proximity among managers and owners of Chilean biotechnology firms, and the probability of their firms starting a formal business relationship (Contreras Romero 2018). Based on primary quantitative data from firms in four Chilean biotechnology clusters, Contreras Romero (2018) adds to our understanding on personal and social proximity by showing that as proximity on these dimensions increases (signalling informal relations between managers of different firms), the likelihood of a formal business relation to be formed also increases (Contreras Romero 2018). The second study in this special issue is a qualitative study about the Murano glassmaking district in Italy. In this study, Leszczyńska and Khachlouf (2018) develop a model that explains how social, cognitive, and personal proximity influence interactive learning and innovation in industrial districts. Results show distinct effects of personal, social, and cognitive proximity, generating implications for regional industrial policy. The third contribution in this special issue investigates the role of different proximities in multiple sorts of informal inter-organizational relationships (Capone and Lazzeretti 2018). This study poses that previous research has been biased toward the study of proximity in mostly formal types of inter-organizational relationships, and it highlights instead how informal relationships are formed, and how various forms of proximity are related to the formation of inter-organizational relationships for innovation-related collaborations.

2. Research agenda: moving beyond conceptualization and exploration

The studies collected in this special issue give rise to various fruitful areas for future research, which we put in a broader perspective below. Furthermore, we summarize the aim, the research designs, and the contributions of the three studies in Table 1. In our discussion of the findings from these studies, we focus on avenues for future research within the scope of two themes in particular: (1) effects of personal and social proximity and (2) research designs to study personal and social proximity.

Considering future research on the effects of personal and social proximity on innovation-related collaborations, the contributions in this special issue come with interesting suggestions. First, the findings in Contreras Romero (2018) point to the 'negative side' of personal and social proximity, arguing that both forms of proximity may cause lock-ins and cliques, which are to the detriment of innovation. Hence, while personal and social proximity have clear benefits, there are drawbacks to both that should not be disregarded. Yet other 'negative sides' to personal proximity were identified in Ooms and Ebbekink (2015). Both studies' findings link to the debate about the effects of proximity on power relations between organizations and individuals

Table 1. Summary of papers in the special issue.

Authors	Research goal(s)	Research design and empirical setting	Main findings
Carmen Contreras Romero	<ul style="list-style-type: none"> Understanding the formation of intra-cluster business relationships, and investigating the role of personal proximity therein. 	Multilevel logistic model to understand creation of business relationships, based on interview and survey data collected from managers in firms of four Chilean biotechnology clusters.	<ul style="list-style-type: none"> Personal and social proximity positively affect the creation of business relationships. Measuring social and personal proximity based on primary data adds to the proximity literature which is largely accustomed to using secondary data to operationalize variables.
Dorota Leszczyńska and Nada Khachlouf	<ul style="list-style-type: none"> Distinguishing social, cognitive, and personal proximity, both conceptually and empirically. Investigating the effects of these proximity dimensions on interactive learning and innovation. Investigating coevolution of proximity dimensions. 	Qualitative, single case study of an industrial district (Murano glass industry, Italy). Triangulating data sources: interviews, documents, and (repeated) observations.	<ul style="list-style-type: none"> Horizontal relationships are built on strong cognitive and social proximity, while vertical relationships are built on strong personal proximity. Vertical relationships, based on personal proximity, led to innovative learning, while horizontal relationships did not, or less so. Regarding coevolution: Social and cognitive proximity are found to be complementary, while substitution effects occur between personal proximity and the aforementioned two dimensions of proximity.
Francesco Capone and Luciana Lazzeretti	<ul style="list-style-type: none"> Investigating the effects of different forms of proximity on the formation of various sorts of informal relationships between organizations. Understanding the impact of social ties on innovation-related collaborations. 	Social network analysis, via exponential random graph models (ERGM), used to understand predictors of network structure. Studying the relationships between SMEs in a cluster focused on applications of high technology in restoration and enhancement of cultural goods/heritage in the Tuscany region of Italy.	<ul style="list-style-type: none"> Geographical proximity is conducive to innovation networks, technical knowledge networks, and friendship networks. Institutional proximity has positive effects on friendships networks, but negative effects on innovation networks and technical knowledge networks. Cognitive proximity only affects the formation of friendship networks, and does so positively. Social proximity is more important in innovation networks, than it is in technical knowledge networks or friendship networks. Having social ties (i.e. friendship) increases the likelihood of forming innovation-related collaborations.

in collaborative innovation projects, recently opened by Hansen and Mattes (2018), although said study was related to other proximity dimensions. Considering that power is an attribute that actors derive from the relationship with others (e.g. Hansen and

Mattes 2018), it is quite conceivable that personal and social proximity may have major implications for power relations in innovation. Therefore, we call for future studies to conduct analyses of the effects of personal and social proximity on power relations and, subsequently, to understand the consequences of power derived from proximity in collaborative innovation projects. How do personal and social proximity affect one's power and influence in innovation processes? In other words, does it matter to whom you are personally or socially close (or distant)? Approaches to this research problem could range from longitudinal case studies of collaborative innovation projects, to experimental designs, and may even utilize social network analyses.

Second, one important reason that personal and social proximity have been conflated in many studies, is that proximity analyses to date have been rather static. Therefore, it has not always been clear that proximity dimensions co-evolve, and thus affect each other. That is, proximity on some dimensions enables and reinforces proximity on other dimensions, and vice versa. At times, proximity dimensions act as complements to one another in affecting innovation outcomes. Leszczyńska and Khachlouf (2018) demonstrate the unique importance of personal proximity for learning and innovation in industrial districts. Their research shows how personal proximity may act as a substitute to social proximity and cognitive proximity under some circumstances, i.e. in case of vertical relationships, and how cognitive and social proximity are important complements rather than substitutes (contrary to what was previously suggested in Boschma, 2005) under yet other circumstances, i.e. in case of horizontal relationships. They point out that future research should encompass more industrial districts, and should follow these districts over time to capture the evolution of districts, and the role of different proximities in this evolution. From this study, it can be gathered that advancing our understanding of personal proximity effects is particularly interesting when it comes to vertical relationships between (individuals in) firms. In the contribution of Capone and Lazeretti (2018), the importance of multiple informal relationships in innovation collaborations is shown. Interestingly, the empirical work shows how different sorts of proximity affect the formation of different sorts of informal relationships. Social proximity in particular has some interesting effects on innovation-related versus more routine technical knowledge or friendships ties. The study also shows a strong link between geographical proximity and all sorts of informal ties. Future research could address the interplay between formal and informal relationships, as these co-evolve over time. In this respect, network analysis may provide a useful tool to capture the relational dynamics of an industrial district. So, in line with these studies, as well as with Boschma, Marrocu, and Paci (2015) and Balland, Boschma, and Frenken (2015), we would like to call for analysis of the dynamics of personal and social proximity to show this co-evolution, most likely involving various other kinds of proximity. These types of studies would require longitudinal designs, mapping and tracing the development of social networks and personal relationships in industrial districts and clusters, or smaller scale collaborative innovation projects, as follows from Capone and Lazeretti (2018) and Contreras Romero (2018).

In addition to the suggestions for research designs following from the special issue papers' findings, there is another research design choice that could lead to further advances in the field. That is, the concept of personal proximity has mainly been analysed from an economic (geography) perspective in previous studies. At the same

time, it has obvious inherent features of psychology. In order to add to our understanding of personal proximity, it would be helpful to work together with organizational psychologists, and employ techniques to assess individuals' traits and characteristics (e.g. 'the Big Five' model, see Digman 1990). Efforts along these lines would also contribute to contrasting subjective measures of personal proximity – or measures of perceived proximity based on qualitative data and mostly indicative of the '(dis)click' assumed to follow from having personal proximity or not (e.g. Werker, Ooms, and Caniels 2016; Wilson et al. 2008) – with objective measures of personal proximity, e.g. measures reflecting actual (dis)similarity on the personal level (operationalizing the distance between persons in terms of their traits and characteristics).

3. Conclusion

This special issue sought to advance our understanding of personal and social proximity by moving beyond conceptualization and exploration of the concepts' relationships and effects. In doing so, we extend ongoing discussions in the industry and innovation literature, such as those in another recent special issue in the *Industry and Innovation* journal on the advantages and disadvantages of geographical proximity through collocation (Mudambi, Narula, and Santangelo 2018). While the contributions in the current special issue each advance our understanding in different ways, one should recognize that the studies in this issue make complementary and important contributions to the conceptualization of personal and social proximity. That is, in their own ways, each of the contributions serves to reaffirm that there is discriminant validity between personal and social proximity. Hence, these contributions revisit the proximity framework, and contribute to opening it up to include personal proximity. Thereby, the introduction to this special issue and the issue's empirical papers also contribute to the creation of a dialogue between economic geography and 'mainstream' management science disciplines (e.g. organizational behaviour). This quest to find relevant synergies between the disciplines is relevant to the development of a more relational economic geography, and is a quest that was recently pursued by others as well (e.g. Nicholson, Gimmon, and Felzensztein 2017).

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No potential conflict of interest was reported by the authors.

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