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## Towards a Geography of Knowledge Creation: Contributions from the Practice View

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**Towards a Geography of Knowledge Creation: Contributions from the Practice View**

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Keywords:	innovation, knowledge creation, communities of practice, agglomeration, place

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Manuscripts

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3 Towards a Geography of Knowledge Creation: The Ambivalences between  
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5 'Knowledge as an Object' and 'Knowing in Practice'  
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22  
23 Abstract:

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25 This paper juxtaposes two strategies to conceive human expertise and unveils how  
26  
27 they mould our imaginations on the spatiality of innovation processes. While the noun  
28  
29 'knowledge' signifies a rationalistic approach and entails a geography that propels an  
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31 'argument of agglomeration', the verb 'knowing' denotes a situated-in-practice  
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33 understanding and inheres an 'argument of place'. The paper discusses in how far an  
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35 extension of the so far less influential practice view might complement the more  
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37 traditional agglomeration accounts. The ontological discrepancies between both  
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39 approaches can be used as theoretical springboards to more fully illuminate the key  
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41 ambivalences of a geography of knowledge creation.  
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49 innovation, knowledge creation, communities of practice, epistemic communities,  
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51 agglomeration, place

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56 IBERT O. (200?) Auf dem Weg zu einer Geographie der Wissenserzeugung: Die  
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58 Ambivalenzen zwischen Wissen als Objekt und Wissen als Praxis, Regional Studies  
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60 XX, XXX–XXX. Der Beitrag vergleicht zwei grundlegende Strategien Wissen

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konzeptionell zu fassen und legt offen wie diese Strategien unsere Vorstellungen der räumlichen Organisation von Innovationsprozessen beeinflussen. Während das Nomen 'knowledge' für eine rationalistische Strategie steht und eine Geographie des Lernens entwirft, die sich um ein Agglomerationsargument herum gruppiert, wird das Verb 'knowing' in einem Ansatz gebraucht, der Wissen als situiert in Praxis begreift und dessen Geographie durch das Orteargument umrissen werden kann. Der Beitrag diskutiert, inwieweit das bisher weniger einflussreiche Praxisverständnis von Wissen stärker gewichtet und als komplementär zum traditionelleren Agglomerationsargument angesehen werden sollte. Die ontologischen Diskrepanzen zwischen beiden Anätzen werden als Ausgangspunkte genommen, um wesentliche Ambivalenzen einer Geographie der Wissensproduktion besser zu verstehen.

Innovation, Wissenserzeugung, Praktikergemeinschaften, epistemische Gemeinschaften, Agglomeration, Ort

[...]

JEL Classifications: D83, D85, R11, R12

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3 INTRODUCTION  
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5 Knowledge is one of those words: we know exactly, what it means – until we are  
6 forced to define it. Its elusiveness only becomes obvious, when we try to pin it down  
7 in definite terms. Today knowledge is broadly used as a scientific notion for the most  
8 important and dynamic driver of the modern economy (DRUCKER, 1993). It has  
9 climbed to the position of a keystone within strategic management (HANSEN et al.  
10 1999) as well as regional and national research, technology and development  
11 policies (COHENDET and MEYER-KRAHMER, 2001). Along with its growing  
12 practical relevance and policy significance it increasingly turns out to also be a key  
13 explanatory variable in spatial innovation theories (SIMMIE, 2005; LORENZEN,  
14 2005; MALMBERG and MASKELL, 2002). Among economic geographers there is a  
15 broad consensus on this enhanced importance of knowledge. This strong mutual  
16 consent, however, has a strong tendency to form an unholy alliance with our intuitive  
17 certainty about knowledge. Knowledge is in danger of becoming an unproblematic  
18 theoretical passe-partout that does not deserve our full awareness anymore. John  
19 ALLEN (2000), for instance, criticized that the majority of empirical works equate  
20 economic knowledge with a rationalistic, or in his wording the “cognitive” concept of  
21 knowledge without explicitly accounting for it and without taking alternative views into  
22 consideration. “It is not we cannot stand outside the discourse, but rather the fact that  
23 in order to engage in a debate about the nature of economic knowledge it is easier to  
24 place oneself within the cognitive discourse” (ALLEN, 2000, p. 31).  
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52 This paper seeks to dig deeper into the ontological groundwork of the knowledge  
53 discourse within economic geography. It thereby identifies and explicates two  
54 fundamental intellectual strategies of grasping the elusive phenomenon of human  
55 knowledgeability: the noun ‘*knowledge*’ signifies the rationalistic strategy that treats  
56 economic knowledge as an independent, factual object whereas the verb ‘*knowing*’  
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3 conveys a performative conception and treats human expertise as being inseparably  
4 intertwined with social practices.  
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8 Secondly, the paper unveils how these different conceptualisations of knowledge  
9 mould our ideas on the spatial organization of innovation processes. The more  
10 commonly used concept of 'knowledge' refrains in a long-established, yet still  
11 prevalent theoretical tradition, which persistently reiterates the idea of  
12 "agglomeration" (SIMMIE, 2005). Hence, I refer to it as the '*argument of*  
13 *agglomeration*'. The second theoretical strand is based on the performative concept  
14 of 'knowing' in practice. It is much less elaborated in economic geography by now,  
15 however, it has gained an increased attention most recently (e.g. THRIFT, 1999;  
16 COE and BUNNEL, 2003; AMIN and COHENDET, 2004; BARNES, 2004;  
17 GRABHER 2004; MATTSSON, 2006; GRABHER and IBERT, 2006). As an  
18 engagement with practice necessarily has to take place at a specific location, I  
19 outline the schemes of this alternative geography of innovation as the '*argument of*  
20 *place*'.  
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38 The interesting point for regional studies is not playing out the one argument against  
39 the other. Both might equally contribute to our understanding of the spatial logics of  
40 knowledge creation as they mutually illuminate their respective theoretical blind  
41 spots. In its third section the paper discusses in how far the two approaches might  
42 work together for the benefit of regional scholars. The two research traditions should  
43 not be blended into a third approach. Rather, some key ambivalences of a geography  
44 of knowledge creation might be clarified if the tension between the two fundamentally  
45 different theoretical perspectives will be sustained.  
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57 Methodically, the paper takes up John ALLEN's (2000) challenge of 'standing  
58 outside' a discourse in a twofold way. In a first sense, it means transcending  
59 disciplinary boundaries. Throughout the argument, the paper does not only review  
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3 literature from the domains of human geography and regional economy, it also  
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5 ventures into the disciplinary fields of science, economic and organizational  
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7 sociology, with a special focus on the “communities of practice” (BROWN and  
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9 DUGUID, 1991; 2001; LAVE and WENGER 1991; WENGER 1998) debate and on  
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11 the “science and technology studies” (LATOURE and WOOLGAR, 1979; LATOUR,  
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13 1987; KNORR CETINA, 1981 and 1999; SUCHMAN, 1987). This selection of  
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15 literature yields a substantial caveat. While the argument of agglomeration bases on  
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17 a huge body of empirically grounded and disciplinary anchored works (SIMMIE,  
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19 2005; MOULAERT and SEKIA, 2003; LAGENDIJK, 2003), the argument of place  
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21 only very recently emerged in the regional sciences and consists of basically  
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23 conceptual works (AMIN and COHENDET, 2004; BARNES, 2004; THRIFT, 1999). In  
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25 this paper, I try to countervail the lack of systematic empirical evidence (COE, 2005)  
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27 by additionally referring to contributions, which only indirectly address questions of  
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29 spatial relevance, and by interpreting their empirical findings in the light of a  
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31 geography of knowledge creation (e.g. KNORR CETINA, 1981; v. HIPPEL, 1994).  
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38 In a second sense, ‘standing outside’ means operating at a meta-theoretical level.  
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40 Rather than going deep into the discourses and scrutinizing each of their fine  
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42 nuances the paper aims at portraying roughly their internal logics. Of course, this  
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44 approach incurs the danger of evoking a too stylised picture of the current debates.  
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46 However, this risk seems justifiable, as the meta-theoretical level of abstraction  
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48 allows to contrast the typical – in the sense of distinctive – features of two formerly  
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50 unrelated theoretical traditions and helps to identify and compare the implicit  
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52 assumptions about economic knowledge in both theoretical strands.  
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60 TWO THEORETICAL PERSPECTIVES: ‘KNOWLEDGE’ AND ‘KNOWING’

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3 The perspectives of 'knowledge' and 'knowing' represent general intellectual  
4 strategies of understanding the peculiar ways human beings know (ANCORI et al.,  
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The perspectives of 'knowledge' and 'knowing' represent general intellectual strategies of understanding the peculiar ways human beings know (ANCORI et al., 2000; LORENZ, 2001). They appear to be as old as thinking about knowledge and learning itself. During the tidal changes within scientific debates their relative value shifted continuously (BLACKLER, 1995). What are the main differences?

#### Knowledge as an object, or: the rationalistic approach

Knowledge may be understood as a phenomenon with the status of an object. The underlying idea is the rationalistic assumption of "the existence of an *a priori* knowable external reality which is true at all times and in all places and which is the highest grade of knowledge" (ANCORI et al., 2000, p. 260). Pythagora's theorem resembles such an eternal truth that may exist and remain true detached from the vanities of the mundane social world. Knowledge appears as an object that exists on its own and is dissociated from individuals, applications, and social context. "The result is a 'spectator' theory of knowledge that separates theory from practice" (AMIN and COHENDET, 2004, p. 18). Acquiring new knowledge is tantamount to 'unveiling' or to 'discovering' something pre-existing – "what was there all along ... needs a few people, not to shape it, but to help it to appear in public" (LATOURE, 1987, p. 134).

The rationalistic approach pursues a "taxonomic" (TSOUKAS, 1996, p. 13) view on knowledge. Researchers develop classifications of different forms of knowledge and use them to examine the fitting strategies and techniques through which they can be created, codified, transferred, and exchanged (ORLIKOWSKI, 2002, p. 250). The most prominent taxonomy is one in the continuation of the distinction between tacit knowing and explicit knowledge first undertaken by Michael POLANYI (1958; 1966). Taxonomies lead to a dissection of complex knowledge architectures into "discrete entities" (ORLIKOWSKI, 2002, p. 250), unchangeable facts, which share critical



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3 characteristics with a commodity or a “stock” (COWAN et al., 2000). This view  
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5 reverberates in metaphorical phrases commonly used in the discourse, such as  
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7 knowledge ‘circulates’ between actors, it is ‘exchanged’, ‘shared’, ‘stolen’ or ‘sold’, it  
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9 can be ‘stored’ and ‘accumulated’ but may also ‘get lost’. Moreover, this view inheres  
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11 a quantitative conception of knowledge. Being knowledgeable means to ‘possess’ a  
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13 large number of knowledge entities (AMIN and COHENDET, 2004).  
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17 Furthermore, the rationalistic approach yields the idea that knowledge consists of  
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19 commensurable quanta. The rationalistic idea of progress implies that new  
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21 knowledge expands and advances old knowledge. As long as knowledge is founded  
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23 onto a rational groundwork, it is commensurate with the knowledge of predecessors  
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25 and hence may be accumulated in a progressive way (BARNES, 2004, p. 568).  
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### 31 32 Knowing in practice, or: the performative approach

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34 In contrast to the noun ‘knowledge’ the verb ‘knowing’ indicates that what we know  
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36 rather than a thing or a static property should more adequately be seen as the “ability  
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38 to act” (STEHR, 2001, p. 89); in short words: „Knowing is in our action“ (SCHÖN,  
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40 1983, p. 49). Knowing reveals and constitutes itself in knowledgeable action and in  
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42 purposeful intervention, it is “situated in practice” (SUCHMAN, 1987) in the sense  
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44 that it only becomes meaningful in relation to a distinct social practice. While the  
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46 rationalistic approach to knowledge is essentially an individualistic one (the individual  
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48 posses knowledge entities), the embeddedness into practice view stresses the  
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50 collective (the individual being part of an epistemic community) nature of knowing  
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52 (ANCORI et al. 2000, pp. 274ff.).  
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57 The notion of knowing implies a holistic understanding of intelligible action. Knowing  
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59 cannot be split up into separate quanta. Rather, distinct pieces of information can  
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only be understood in relation to the knowledge architecture they are part of and to

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3 the practices they are “useful” (STEHR, 2001, p. 90) for. For instance, the taxonomic  
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5 dichotomy between tacit knowing and codified knowledge does not make any sense  
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7 from this theoretical perspective. Tacit knowing is a necessary component of all  
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9 knowledge (POLANYI 1966; TSOUKAS 1996), it “is inscribed into the artefacts of  
10  
11 codified knowledge“ (AMIN and COHENDET, 2004, p. 95).  
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15 Furthermore, the performative concept of knowing entails a procedural understanding  
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17 of our ability to act. Rather than an unchangeable certainty or an eternal truth,  
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19 „knowing is an ongoing social accomplishment, constituted and reconstituted in  
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21 everyday practice“ (ORLIKOWSKI, 2002, 252). Our mode of knowing changes  
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23 impalpably during its repeated practical application in an experimental, sometimes  
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25 improvisational and almost always in an incremental way. Knowing cannot exist in a  
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27 completed status, it is necessarily in permanent flux (WEHLING, 2006, pp. 90f.).  
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31 Due to its embeddedness in social practice, knowing cannot simply retain its practical  
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33 value when ‘transferred’ across time and space. “When practices are defined as the  
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35 situated recurrent activities of human agents they cannot simply be spread around as  
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37 if they were fixed and static objects” (ORLIKOWSKI, 2002, p. 253). Accordingly,  
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39 knowing cannot consist of commensurable entities that can be accumulated  
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41 smoothly. Rather, elements of knowledgeability derived from different practices or  
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43 cultures only inconsistently fit together and partly may even rest on contradictory  
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45 assumptions (LATOUR, 1987, p. 201). While quanta of knowledge can be  
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47 ‘exchanged’ and even ‘traded’ between actors, the essence of a distinct practice has  
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49 to be ‘translated’ (ANCORI et al., 2000, p. 279) across cultural boundaries.  
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51 Translation means “helping others develop the ability to enact ... the knowing in  
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53 practice” (ORLIKOWSKI, 2002, p. 271).  
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Table 1. Knowledge vs. knowing

Insert table 1 about here

This short effort to reflect upon the internal logics of different approaches towards economic knowledge does not aim at claiming intellectual superiority of the one or the other approach. Both approaches are associated with specific theoretical strengths. The taxonomic account of 'knowledge' is more sensitive for the mechanisms of modernity to dis-embed consuetudinary ways of knowing from local and traditional contexts (DRUCKER, 1993; COWAN et al., 2000). The performative notion of knowing gears the attention towards the socially constructed character and contextually embedded status of our knowledge and hence strengthens our awareness that even scientific facts, which are traditionally regarded as 'objective' and 'universal' truths, are strongly moulded by personal interests (LATOURE, 1987; PICKERING, 1992), inter-personal power relations (LATOURE, 1987), pragmatic and economic considerations (KNORR CETINA, 1981) and – interesting for geographers – by essentially local practices (KNORR CETINA, 1981; BARNES, 2004).

#### GEOGRAPHIES OF KNOWLEDGE CREATION

The above elaborated theoretical viewpoints resonate in two distinct geographies of innovation: while the rationalistic account of knowledge engenders an 'argument of agglomeration' the performative view on knowing inheres an 'argument of place'.

### The argument of agglomeration

Recent economic geography of innovation puts a strong emphasis on the centripetal forces of learning and knowledge creation (OINAS, 1999, p. 363; LORENZEN, 2005, p. 401). What are the underlying mechanisms that lead to an agglomeration of innovative actors and activities?

In the majority of cases, creating new knowledge is a result of “interactive learning” (LUNDVALL, 1988). It embraces several individual actors who are affiliated with a plethora of economic, non-economic and intermediary organizations. In essence, interactive learning means an *exchange* of critical knowledge and thus critically depends on information processing (ANCORI et al. 2000, p. 260). Geography becomes an important part of interactive learning, since the transfer of knowledge across distance might be intricate. This core idea is accentuated most prominently in accounts, which distinguish between two types of knowledge; ‘tacit’ and ‘codified’ knowledge.

Codified knowledge can easily be transferred via the channels of ICT-systems across huge distances. Despite some unresolved incentive paradoxes of a virtual knowledge exchange (STEINMÜLLER, 2000) and the problem of information abundance (COHENDET and MEYER-KRAHMER, 2001), codified knowledge is widely referred to as resembling a “ubiquity” (MASKELL and MALMBERG, 1999, p. 16), a “public good” (HOWELLS, 2002; critically: BRESCHI and LISSONI, 2001; JOHNSON et al., 2002), or at least an “economic good” (COHENDET and MEYER-KRAHMER, 2001) that can be traded on markets. As such codified knowledge can be accessed with decreasing effort by nearly anyone and it can be applied almost everywhere. It offers only insignificant competitive advantages and thus is not well suited to substantiate the centripetal tendencies of knowledge-intensive industries.

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3 Tacit knowledge, by contrast, is less ubiquitous and insofar a potential source of  
4 competitive advantage. "The tacit dimension of knowledge exists in the background  
5 of our consciousness" (GERTLER, 2003, p. 77). Tacit knowledge is difficult to share,  
6 since when skilled performers attempt to describe or explain their successful  
7 performance they must first try to develop their own awareness. This leads to a  
8 second, related problem: "even when one has achieved full self-awareness ...  
9 symbolic forms of communication such as spoken or written words cannot convey all  
10 of the knowledge necessary for successful execution" (GERTLER, 2003, p. 77;  
11 COWAN et al., 2000; JOHNSON et al., 2002). Geography matters as distance  
12 influences the functional and social preconditions for as well as the costs of an  
13 exchange of tacit knowledge.  
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- 16 • The *functional* explanation reflects upon the main characteristics of tacit  
17 knowledge. It is practically unfeasible to convert tacit knowledge in a sequence  
18 of information or to express it as a set of rules. "If there are rules for these  
19 things, their location is society itself and to know them one has to join in the  
20 ongoing flux of social life" (COLLINS, 2001, p. 117). Tacit knowledge can only  
21 be shared during its application and execution in practice. Learning that  
22 embraces the exchange of tacit knowledge can only be performed in close  
23 collaboration and presupposes the frequent co-presence of the participants at  
24 the same location (HOWELLS, 2002; MORGAN, 2004). The necessity to  
25 communicate complex and ambiguous contents needs frequent face-to-face  
26 interactions and facilitates a spatial agglomeration of actors and firms even  
27 under conditions of high mobility and ubiquitous access to virtual  
28 communication (STORPER and VENABLES, 2004, p. 353; GLAESER, 1999).  
29 "A cognitive account of economic knowledge reinforces the tendency to  
30 equate tacit understanding with local embeddedness and codified knowledge  
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3 with the wider, ubiquitous area" (ALLEN, 2000, 31; KIRAT and LUNG, 1999;  
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5 AMIN and COHENDET, 2004; FAULCONBRIDGE, 2006).

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- The exchange of tacit knowledge needs a *social* underpinning, mutual trust (COOKE and MORGAN, 2000; MORGAN, 2004). "Trust exists when one actor expects that another will behave in such a way that the safety and security of the first actor will be preserved, under conditions in which the first actor is both, *dependent* upon and *vulnerable* to the actions of the second" (BABA, 1999, p. 333, original emphasis). Trust among actors affords collaboration in which the effort can be spent on the content rather than on mutual control. It enables, for instance, competitors to cooperate and independent firms to share the risks and costs of innovation processes. Trust cannot be directly attributed to spatial proximity, however, it is more likely to occur among co-located actors. Trust can be regarded as a "function of reciprocity" (ENGLISH-LUECK et al., 2002, p. 95), it evolves only gradually but might be frustrated very quickly. Proximity matters, as it is easier and cheaper to sustain long-term reciprocity with proximate partners. Moreover, the threshold to initiate a trustful relationship is lower, as neighbouring partners are more perceptible and easier to sanction than distant ones.
  - Frequent face-to-face collaborations can in principle be organized across distance and a trustful relationship may also be sustained between distant partners (ENGLISH-LUECK et al., 2002). However, the problem is that both incurs considerable *costs*, for example an investment of time and money for individual mobility (ZELLER, 2004). The spatial 'stickiness' of tacit knowledge is to some extent interpreted in the light of transaction cost theory (WILLIAMSON, 1975). To enhance their flexibility firms replace internal hierarchical orders with external market transactions. Spatial proximity
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3 between partners can reduce the costs and risks of these market transactions,  
4 especially when non-standardised goods, critical assets or complex services  
5 are traded (SCOTT, 1988). "The cluster exists, it is implied, because the  
6 colocation of firms cuts the expenses of identifying, accessing, and  
7 transferring knowledge" (MALMBERG and MASKELL, 2002 p. 434).

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10 Within an agglomeration the outlined functional, social, and economic preconditions  
11 for interactive learning activities interpenetrate. Consequently, a cluster forms a  
12 complex system of interrelated and densely connected actors and thus provides a  
13 fruitful local context for knowledge production (ENRIGHT, 2003). The gravitational  
14 forces that uphold the innovative agglomeration increase with the multitude and  
15 diversity of actors who critically contribute to innovation processes as well as with  
16 their interconnectedness. "The better the different knowledge and information  
17 streams are connected, the more adaptive and innovative both the individuals and  
18 the entire spatial innovation system becomes, be it within a city, a region or a nation"  
19 (HELBRECHT, 2004, p. 195f.).

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22 The privileged position of 'tacit knowledge' in this discourse indicates that the  
23 argument of agglomeration to some extent acknowledges that human expertise partly  
24 eludes from a purely objectified understanding. However, in its core the  
25 argumentation is still driven by the rational account of knowledge. To 'share' tacit  
26 knowledge insinuates that there is a factual stock of knowledge to which selected  
27 adepts have privileged access. Moreover, the taxonomic dichotomy of tacit vs.  
28 codified is the main springboard for theoretical reasoning. While Michael POLANYI  
29 (1966) emphasized that all knowledge necessarily *bases on* tacit knowing the  
30 enunciators of the argument of agglomeration interpret his work as the establishment  
31 of two distinct *types of* knowledge. When knowledge can only be either tacit or  
32 codified the question of how to 'convert' tacit into codified knowledge and how to  
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3 'substitute' the one type of knowledge with the other arises (COWAN et al., 2000):  
4  
5 „The relevant question is not whether some knowledge is *in principle* articulable or  
6  
7 necessarily tacit, but whether the costs of codification are sufficiently high so that the  
8  
9 knowledge remains *in fact* tacit” (MORGAN, 2004, p. 7, original emphasis). In this  
10  
11 quote tacit knowing is reduced to a 'residual category' (COWAN et al., 2000, p. 212)  
12  
13 that embraces the stock of all not-(yet)-codified knowledge. Further, the use of the  
14  
15 wording – note that Polanyi originally coined the term 'tacit *knowing*' whereas in  
16  
17 today's discourse 'tacit *knowledge*' is more common – additionally indicates that the  
18  
19 theoretical consequences of Polanyi's work are only half-heartedly born. 'Tacit  
20  
21 knowledge' is a hybrid notion, which simply annexes some elements (the difficulty to  
22  
23 express its essence verbally or its relative immobility) of the performative  
24  
25 understanding of knowing to the rational account rather than accepting the tacit  
26  
27 dimension of all knowledge.  
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33 More recent accounts increasingly set out to leave behind the too narrow,  
34  
35 Marshallian imagination of the “region as an island” (AMIN and COHENDET, 2004) of  
36  
37 learning. These works increasingly consider the growing relevance of global  
38  
39 interactions for knowledge production (BATHELT et al., 2004; COE and BUNNELL,  
40  
41 2003) and also substantiate empirically how the local and the global are intertwined  
42  
43 with one another (e.g. ZELLER 2004; GIULIANI and BELL 2005). Moreover, some  
44  
45 contributors challenge the conceptual fruitfulness of the tacit vs. codified juxtaposition  
46  
47 (BRESCHI and LISSONI, 2001; HÅKANSON, 2005; LORENZEN, 2005). However,  
48  
49 even these accounts at least implicitly insinuate that a knowledge transfer to distant  
50  
51 partners is more intricate and needs to be organized more formally and more  
52  
53 intentionally than one to proximate ones. While economic actors within an  
54  
55 agglomeration may “take advantage of geographical proximity” (LORENZEN, 2005,  
56  
57 p. 403) and of the low costs of an informal knowledge transfer, those engaged with  
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3 transnational alliances are forced to somehow “compensate” (LORENZEN, 2005, p.  
4  
5 403) for the increased costs of the same processes and to more formally organize  
6  
7 the knowledge transfer (ZELLER, 2004). Moreover, global interactions are supposed  
8  
9 to need more “institutional and infrastructure support“ (BATHELT et al. 2004, p. 48),  
10  
11 whereas the local buzz will “automatically result ..., if a number of actors are placed  
12  
13 within a region” (BATHELT et al. 2004, p. 48).  
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### 20 The argument of place

21  
22 The practice view on knowing puts the qualities of place into the fore (PAASI, 2004,  
23  
24 p. 540). Etienne WENGER distinguishes between *engagement with* and *participation*  
25  
26 *in practice*. Engagement with practice is necessarily local, because it is restricted to  
27  
28 the actual performance of a practical task. “The cosmopolitan character of practices  
29  
30 ... does not free it from the locality of engagement. Day-to-day work in an office at  
31  
32 UN headquarters is still local in its own way, even though it deals with international  
33  
34 affairs” (WENGER, 1998, p. 131). Participation in practice, by contrast, cannot be  
35  
36 simply turned on and off, rather it is part of a professional identity that people will  
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38 carry always with them, even if the related activities are not actually undertaken  
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43 (WENGER, 1998, p 57).  
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### 50 Engagement with practice

51 The idea of engagement with practice attaches human knowledgeability to a place at  
52  
53 which the related “activities can intelligibly be performed“ (SCHATZKI, 1996 quoted in  
54  
55 THRIFT, 1999, p. 311). Such locations, or “learning places” (IBERT, 2006), structure  
56  
57 and are structured by the learning activities of the involved researchers and  
58  
59 entrepreneurs. On the one hand these places enable learning practices as they  
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provide the typical artefacts and the material infrastructure (LATOUR, 1987). For

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2  
3 instance, the equipment and devices assembled in a nanotech-laboratory constitute  
4 a physical manifestation of the corresponding practice of knowledge formation  
5 (IBERT, 2006). “Practices incorporate the objects that they are enacted with and on  
6 and the settings in which they are enacted” (ROUSE, 1996, p. 135; LORENZ, 2001;  
7 THRIFT, 1999). On the other hand practices of knowledge creation continually  
8 transform the learning places they dwell in. They are arranged around an “epistemic  
9 object” (KNORR CETINA, 2001), for instance a new computer code or a  
10 pharmaceutical. Until the end of the development process this epistemic object  
11 remains incomplete and provisional, it continually ‘mutates’ before gradually  
12 ‘unfolding’ to its ultimate shape (KNORR CETINA, 2001, p. 182). The corresponding  
13 tools needed for the manipulation of the focal epistemic object have to be adapted to  
14 its transient characteristics continually. “The parameters of the laboratory and other  
15 spaces of science ... are constantly being re-negotiated by their ... inhabitants”  
16 (GREENHOUGH, 2006, p. 225)

17  
18 In learning places people speak and understand the language through which a  
19 distinct knowledge practice expresses itself (THRIFT, 1999, p. 316). Practitioners  
20 acquire their notorious jargon by utilising their language as an effective means to  
21 handle concrete situations. A metaphorical expression for instance may prove to be  
22 valuable in a location, when it helps to organize a shared view of a problem or when  
23 it helps to vividly explicate the core idea of a researcher to other practitioners.  
24 Further, crucial experiences are memorised locally (THRIFT, 1999, p. 315) by formal  
25 tools and informal practices of knowledge management (HANSEN et al., 1999;  
26 IBERT, 2004). For instance, the stories told within communities of practice (BROWN  
27 and DUGUID, 1991; 2001) can be regarded as an informal repository of knowledge.  
28 By telling and retelling tales about relevant incidents in practice (‘war stories’) thereby  
29 continually variegating and up-dating the accounts of practical challenges,  
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3 practitioners store the collective experience at a location without freezing it to  
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5 inanimate facts. Additionally, communities memorise practically relevant knowledge  
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7  
8 by handing it from one generation of practitioners to the next one. For neophytes a  
9  
10 community offers a limited time of “legitimate peripheral participation” (LAVE and  
11  
12 WENGER, 1991) during which they remain only incompletely integrated and are not  
13  
14 yet supposed to contribute reciprocally to the common knowledge base.  
15

16  
17 The perspective of practice is not necessarily determined to operate only within  
18  
19 localities that are arranged according to the dispositions of the human body, such as  
20  
21 workplaces (ETTLINGER, 2003), offices (BARNES, 2004), conference rooms,  
22  
23 workshops, or laboratories (LATOURE and WOOLGAR, 1979; KNORR CETINA, 1981  
24  
25 and 1999). The reasoning on “ambient awareness” (GRABHER, 2002a, pp. 1920f.),  
26  
27 for example, conceives town quarters or even whole cities as places, which are  
28  
29 conducive for mimetic processes of mutual learning. In contrast to the argument of  
30  
31 agglomeration, which concentrates on learning processes between vertically  
32  
33 collaborating actors, this branch of the discourse conceives a locality as a cluster of  
34  
35 competitors: “Co-located firms undertaking similar activities find themselves in a  
36  
37 situation where every difference in the solutions chosen, however small, can be  
38  
39 observed and compared” (MALMBERG and MASKELL, 2002, p. 439; RANTISI,  
40  
41 2002). This may stimulate the emergence of a fine-tuned system of “collective  
42  
43 benchmarking” (BROWN and DUGUID, 2000a, p.21) that provides an elaborated  
44  
45 industry-specific expertise not available to outsiders. In more recent accounts the  
46  
47 non-intentional forms of observing adjoining rivals gained an increased attention.  
48  
49 Actors are enculturated to professional standards as they “are surrounded by a  
50  
51 concoction of rumours, impressions, recommendations, trade folklore, strategic  
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53 misinformation” (GRABHER, 2002b, p. 254).  
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3 If constricted to engagement with practice, the argument of place disregards two  
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5 theoretically relevant questions: firstly, it offers only little scope to understand in how  
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7 far place-bound knowing could also be valuable in another context (LORENZ, 2001)  
8  
9 and, secondly – as it stresses the communities’ internal coherence – it does not  
10  
11 address the issue of radical innovation persuasively (SWAN et al., 2002, p. 480).  
12  
13 These theoretical gaps, however, are to some extent addressed by the wider idea of  
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15 participation in practice.  
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### 22 Participation in practice

23  
24 In contrast to engagement with, participation in practice addresses the more general  
25  
26 identity of a knowledge worker as a member of a distinct epistemic community  
27  
28 (WENGER 1998). It uncloses accession not only to a single location, rather  
29  
30 “practices open spaces of interrelated places at which their doings and sayings are  
31  
32 correctly and acceptably performed” (SCHATZKI, 1996, quoted in THRIFT, 1999, p.  
33  
34 311). Processes of knowledge production enact a network between a multitude of  
35  
36 learning places, or in other words; an „archipelago of situated knowledges“ (THRIFT,  
37  
38 1999, p. 303). James FAULCONBRIDGE exemplifies how knowledge practices in the  
39  
40 advertising industry connect diverse learning places across distance. Although “there  
41  
42 are ‘locally specific’ influences ... practices and approaches of creating feelings of  
43  
44 empathy, sorrow, desire or lust ... have global commonality” (2006, p. 529). These  
45  
46 more generic strategies enable the advertisers to find a common language that  
47  
48 facilitates mutual learning, even though, the participants are engaged with diverging,  
49  
50 idiosyncratic localised practices. Thus, within a community of practice location-  
51  
52 specific and time bound knowledge can be “decontextualised” (LAVE and WENGER,  
53  
54 1991). In such a more generic state it is applicable in a variety of other places, as  
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3 long as the actors manage to meaningfully recontextualise it in their local practices  
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5 (LORENZ, 2001).  
6

7  
8 Innovation is only likely to occur if actors manage to connect elements from practices  
9  
10 that belong to different places (MATTSSON, 2006), communities (AMIN and  
11  
12 COHENDET, 2004), or organizations (BROWN and DUGUID, 2000b). Eric von  
13  
14 HIPPEL (1994), for instance, demonstrated empirically that the locus of problem  
15  
16 solving in innovation processes iterates among different sites, when the sticky  
17  
18 information needed to solve a problem is spread across several locations. In  
19  
20 customized software development projects, for instance, software engineers have to  
21  
22 perform critical phases of the development process at the customer's site, since  
23  
24 essential knowledge about the organizational and technical context within which the  
25  
26 software is supposed to work, cannot be detached from this location (GRABHER,  
27  
28 2004; IBERT, 2004; ISAKSEN, 2004). During the process of learning the involved  
29  
30 actors as well as the objects they are developing shuttle back and forth between  
31  
32 several sites (v. HIPPEL, 1994), thereby enacting a spatial pattern, a "learning action  
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34 space" (IBERT, 2006) that connects these interrelated place-bound practices in a  
35  
36 meaningful way.  
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#### 45 46 AGGLOMERATION AND PLACE: AMBIVALENCES OF A GEOGRAPHY OF 47 48 KNOWLEDGE CREATION 49

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51 The generic strengths and weaknesses of the two arguments are related to the more  
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53 general features of structure vs. agency (COE, 2005, p. 384) approaches. While the  
54  
55 argument of agglomeration focuses on the structural conditions of interactive learning  
56  
57 and their complex interdependencies, the argument of place puts human agency  
58  
59 centre stage and concentrates on how individuals act in a concrete situation, thereby  
60  
appropriating, (mis-)employing and purposefully modifying more general conditions

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3 according to their own interests (KNORR CETINA, 1981). While the structural view  
4  
5 tends to overestimate the deterministic powers of institutional regulations  
6  
7 (ETTLINGER, 2003), the agency view is in danger of overemphasizing the  
8  
9 'situatedness' and thus contingency of human activities (SUCHMAN, 1987, pp. viiff.).  
10  
11 The narrow focus on concrete situations impedes the possibilities to reflect upon how  
12  
13 the 'external conditions' came into place and which power constellations are  
14  
15 responsible for their existence (SWAN et al., p. 483). Therefore, in principle, the  
16  
17 pairing of the structural view with the agency view might contribute "to recognize –  
18  
19 more clearly than is usually done – that the logic of the system, that is, the cluster, is  
20  
21 different from that driving the behaviour of its components, that is, the individuals and  
22  
23 firms of which it is formed" (LORENZEN, 2005, p. 434; in this vein: GIULIANI and  
24  
25 BELL, 2005; GRABHER and IBERT, 2006). However, the fundamental differences  
26  
27 between both discourses outlined above (see tables 1 and 2) remain so effectual,  
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29 that they cannot be simply merged into a new, third approach.  
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Table 2. Two geographies of innovation

Insert table 2 about here

55 I propose to abide the tension between knowledge and knowing but to use the  
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57 discrepancies in the corresponding ontologies as a springboard for further  
58  
59 theorisation. This can be achieved by utilising the mutual interest of both approaches  
60  
in understanding the spatial organization of innovation processes as a theoretical

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3 lens to more clearly accentuate some key ambivalences of a geography of  
4  
5 knowledge creation.  
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10 The knowledge-based view on spatial patterns and the spatial view on patterns of  
11  
12 knowledge creation  
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14  
15 The argument of agglomeration can be characterized as an effort towards a  
16  
17 *knowledge-based theory of spatial clustering*. "It must explain the existence of the  
18  
19 cluster ... and its internal organization" (MALMBERG and MASKELL, 2002, p. 429;  
20  
21 JOHNSON et al., 2002). One main problem of this research agenda is the  
22  
23 overdetermination of the cluster phenomenon and the resulting "fuzziness"  
24  
25 (MARKUSEN, 1999) of some of the related concepts. The influence of knowledge  
26  
27 creation on the emergence and the evolution of clusters can hardly be isolated from  
28  
29 other, competing variables, such as shared costs of infrastructure, labour markets,  
30  
31 cluster policies, or transaction efficiency, to mention only some (OINAS, 1999). The  
32  
33 practice view has a lot to offer to mitigate this problem, since it is much more  
34  
35 focussed on learning. "The relations that constitute practice are primarily *defined by*  
36  
37 learning. As a result, the landscape of practice is an emergent structure in which  
38  
39 learning constantly creates localities that reconfigure geography" (WENGER, 1998,  
40  
41 p. 131, emphasis added). Thus, the argument of place reverses the theoretical  
42  
43 access to spatial issues. Rather than interpreting spatial patterns from a knowledge  
44  
45 perspective, it interprets *patterns of knowledge formation from a spatial perspective*.  
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53 Due to their primary focus on the micro-mechanisms of learning practice-driven  
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55 empirical works could disentangle the spatial organization of innovation processes  
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57 without being fixated on a specific spatial configuration (the cluster, the  
58  
59 agglomeration). A geography of knowledge creation has to be not only a knowledge-  
60  
based theory of spatial clustering but also a spatial theory of knowledge formation.

### Learning as organizing coherence and irritation

Innovation-oriented learning entails a twofold challenge; “new ideas” and “coordinated action” (OBSTFELD, 2005, p. 101). New ideas require networks that embrace actors, who represent diverse practical backgrounds, organizational affiliations, and scientific disciplines. This incoherent constellation of actors, however, gives rise to the second challenge, the problem of how to initiate coordinated action. Formerly “unconnected people ... are inherently more difficult to mobilize or coordinate, especially around novel ideas” (OBSTFELD, 2005, p. 101). The argument of agglomeration seems to be much more concerned with the challenge of coordinated action. Within an agglomeration creating a diversity of knowledge pools seems not to be the most pressing challenge, since it normally already exists, at least in the successful clusters. Consequently it focuses on how to organise coherence. It continually reiterates the necessity to reduce uncertainty (CAMAGNI, 1991, pp. 126f.) by establishing institutional safeguards and by evoking mutual trust and a common understanding of problems. In contrast, the practice view puts a stronger emphasis on the challenges of creating new ideas. Places are much more than agglomerations characterised by deep-rooted experience, smoothly ongoing routines, and well known people (TUAN, 1975; 1977; PAASI, 2002). Coherence is not something that has to be created arduously, rather in the contrary it is often already in place. Hence, from the practice point of view the question of how to irritate given certainties and how to disrupt established routines becomes more urgent. Learning only occurs, when intruding practices, which do not fit neatly into the ongoing stream of routines, distort the internal coherence of a place or a community. Karin KNORR CETINA, for instance, reports that a scientist became aware of his so far not reflected standards of precision in experimental chemical analysis during his stay in another laboratory.



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3 The differences between the two locally developed and applied interpretive systems  
4 became obvious as in the new environment the scientist's expectations were  
5 persistently violated (KNORR CETINA, 1981). The practice view, thus, highlights the  
6 productivity of "cognitive distance" (NOOTEBOOM, 2001, p. 72) for triggering  
7 innovation. More concretely, the creative potentials of diverging interests  
8 (GRABHER, 1994), the provocative role of the stranger (SIMMEL, 1992; PARK,  
9 1928; SCHUTZ, 1964) as well as professional rivalry (GRABHER, 2002b; GIRARD  
10 and STARK, 2002) is put centre stage the analysis. A geography of knowledge  
11 creation needs to consider both challenges equally. It should understand learning as  
12 a paradox task of organizing coherence and irritation at the same time.  
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## 29 CONCLUSIONS

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31 This paper introduces two different understandings of the key factor of a geography  
32 of knowledge creation (see table 1). The noun 'knowledge' signifies the rationalistic  
33 account of human expertise. Knowledge is treated as a factual object, it consists of  
34 discrete entities, which commensurably fit to one another, and it can be sub-classified  
35 in a taxonomic way. By contrast, the verb 'knowing' highlights that human expertise is  
36 a performance rather than an object, it is situated in practice, exists only in a holistic  
37 fashion and rather than a fixed factum it is an ongoing accomplishment.  
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48 In a second step, this paper explores the two corresponding geographies of  
49 innovation. The 'argument of agglomeration' understands interactive learning  
50 primarily as an 'exchange' of knowledge. Consequently, it highlights the influence of  
51 spatial proximity/distance on knowledge circulation. Innovative activities tend to  
52 agglomerate as a higher density of actors allows knowledge to circulate at an  
53 increased velocity. In contrast, the 'argument of place' conceives knowledge  
54 production as both, a localised practice, which is physically performed at a certain  
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3 location (KNORR CETINA, 1981; BARNES, 2004) and, by the same token, a  
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5 spatially distributed collective endeavour (AMIN and COHENDET, 2004; GRABHER,  
6  
7 2002b; 2004; MATTSSON, 2006; FAULCONBRIDGE, 2006) in which learning  
8  
9 processes connect heterogeneous though interrelated places in a meaningful way.  
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12 The ontological differences of both approaches afford an opportunity to more  
13  
14 explicitly raise some key ambivalences of a geography of knowledge creation. Firstly,  
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16 such a geography can be at once a theory that explains spatial patterns from a  
17  
18 knowledge-based view *and* a theory that interprets practices of knowledge formation  
19  
20 from a spatial perspective. Secondly, it might address innovation-oriented learning as  
21  
22 a paradox task that entails both, the creation of coherence in the face of cognitive  
23  
24 diversity *and* the organization of irritation in the face of cognitive similarity.  
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28 One problem remains to be addressed. Although the practice view has gained an  
29  
30 enhanced attention within the regional sciences there is still a fundamental lack of  
31  
32 instructive empirical accounts, which explicitly address the geographical dimension of  
33  
34 knowledge practices. Before ascending to an equal position with the argument of  
35  
36 agglomeration, the abstract ideas presented in the argument of place literature will  
37  
38 need to be further substantiated by more systematic and detailed supportive  
39  
40 empirical evidence.  
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For Peer Review Only

Table 1. Knowledge vs. knowing

	,knowledge'	,knowing'
ontological status	object	performative
form of existence	absolute reality	situated in practice
temporary boundaries	fixed, factual	provisional, in flux
content boundaries	segmented, commensurable	holistic, incommensurable

Table 2. Two geographies of innovation

The argument of...	agglomeration	place
predominant		
...concept of knowledge	'knowledge'	'knowing'
...reference to geography	distance in space	qualities of place(s)
...spatial scale	meso (region, cluster)	micro (lab, office)
...social scale	meso (inter-organizational and intra-regional)	micro (inter-personal)
...concept of learning	processing of knowledge entities	enculturation in and translation across communities