

Knowledge and Space

The close interrelation of knowledge and power, knowledge and socio-economic development, the conflicts between orthodox and heterodox knowledge systems, and the economisation of knowledge play a decisive role in society and has been studied by various disciplines. The series "Knowledge and Space" is dedicated to topics dealing with the production, application, spatial distribution and diffusion of knowledge. Science Studies, Actor-Network Theory, research on learning organisations, studies on creative milieus, and the Geographies of Knowledge, Education and Science have all highlighted the importance of spatial disparities and of spatial contexts in the creation, legitimisation, diffusion and application of new knowledge. These studies have shown that spatial disparities in knowledge and creativity are not a short-term transitional event, but a fundamental structural element of economy and society.

The volumes in the "Knowledge and Space" series will cover a broad range of topics relevant for all disciplines in the humanities, social sciences and economics focusing on knowledge, intellectual capital or human capital, e.g. clashes of knowledge, milieus of creativity, Geographies of Knowledge and Science, the storing of knowledge and cultural memories, the economization of knowledge, knowledge and power, learning organizations, the ethnic and cultural dimensions of knowledge, knowledge and action, and the spatial mobility of knowledge. These topics are to be analysed and discussed at an interdisciplinary level by scholars from various disciplines, schools of thought and cultures.

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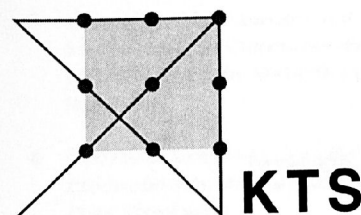
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Milieus of Creativity

An Interdisciplinary Approach to Spatiality of Creativity



KLAUS TSCHIRA STIFTUNG
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Chapter 10

Space(s) of Innovation: Regional Knowledge Economies

Martina Fromhold-Eisebith

In terms of subnational entities such as urban agglomerations, provinces, and counties, regions are major arenas in which knowledge-producing and knowledge-exploiting activities are rooted, with marketable innovative products or processes emerging from the location-specific interplay of economic, social, cultural, technological, and political factors (Malecki, 1997, 2000; Meusburger, 2000, 2008). Presumably, there is something fundamentally “spatial” and “place-bound” that determines the abilities of corporate actors to innovate. There are also certain constellations of factors that shape spaces of innovation, understood as outstanding agglomerations of firms and other organizations that successfully engage in the generation and economic exploitation of knowledge-intensive activities. Because creativity is important in inducing innovativeness, the notions of spaces of innovation and milieus of creativity are, logically, strongly linked, as I show in this chapter.

Like regional economists, economic geographers have been exploring relevant dynamics and determinants of the knowledge-based economy for several decades, filling entire libraries with their writings (for recent synopses, see Cooke et al., 2007; Simmie, 2005). In the following pages I draw on a range of these works to present currently prominent chains of argumentation and perspectives. I discuss key terminological, conceptual, and empirical foundations, trying to open the black box of why and how innovative spaces and regional knowledge economies evolve in response to the dynamics of an environment that enhances creativity.

Evidence showing the significance of a geographical view on issues of economic creativity is easy to come by. Maps marking the distribution of knowledge-intensive activities across regions clearly convey the spatially distinct nature of these phenomena. One input indicator—the intensity of research and development (R&D) in the regions of the European Union (EU)—reveals an eminent set of knowledge-oriented places, notably in Germany, France, Scandinavia, and the United Kingdom (see Fig. 10.1). Indeed, just a dozen regions account for over one

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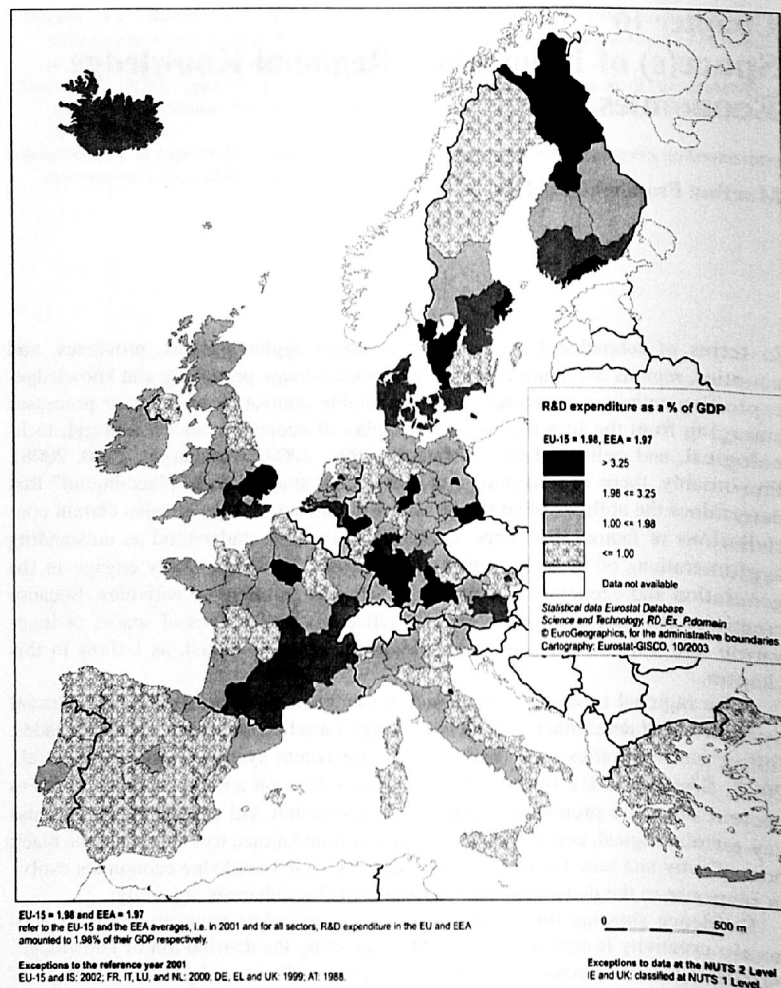


Fig. 10.1 R&D expenditure as a percentage of GDP, all sectors, by European Economic Area region, 2001 (NUTS 2 level) (From the European Commission and Eurostat, 2004, adapted with permission)

third of all R&D in the EU (European Commission & Eurostat, 2004). Similarly, an output indicator—patent applications—points to particularly creative *localities*, some of them in southern Germany (Greif, 2004). Outside the EU, too, the world has well-known, outstandingly dynamic technology hotspots such as Silicon Valley

and Route 128 in the United States and Bangalore in India. Obviously, knowledge-based economic capabilities are very unevenly distributed across space and tend to agglomerate mainly in urban areas. As Simmie (2005) states, “there is a distinctive geography of innovation” (p. 790). I therefore closely examine place-specific assets in order to find out why.

The issue, however, is more complicated than it may first appear. Disparities of innovativeness exist on various interdependent scales of activity that can be described as a cascade of clustered creativity. Economic creativity differs between:

continents or economic blocks,

countries within a continent,

regions within a country,

cities within a region,

quarters within a city,

firms within a quarter,

teams within a firm, and

individuals within a team.

It is not easy to discern which level has the most influential constellation of identifying factors that aggregate to, and are reflected in, uneven spatial patterns of knowledge production and application. Disparities of innovativeness may thus emerge from the concatenation of different scale-specific sets of interdependent factors, influenced by economic and business issues; technological dynamics and infrastructure; and political, social, cultural, and psychological aspects. Moreover, constellations probably differ from one time or project phase to the next, for producing innovations is a rather discontinuous endeavor (Grabher, 2002). As suggested by the cascade depicted above, such complexities call for an approach that is both systemic and multidisciplinary if one is to explain convincingly why landscapes of innovativeness look as heterogeneous as they do.

These two features are what recommend economic geography in this context. Creativity, knowledge production, and innovation-oriented application are marked by a few clearly context-dependent qualities (see Cooke et al., 2007; Cooke & Schwarz, 2007; Meusburger, 2008). They include:

- The situatedness of innovation and knowledge creation, for processes take place and are bound to a given location or sets of interacting locations
- The relevance of local conditions and situations; and
- The role of spatial (physical) proximity of actors (or of economic, organizational, social, cultural, or epistemological elements)

Research on knowledge production and innovativeness can therefore substantially profit from geography's focus on regionally specific conditions and systemic sets of interdependent factors that shape economic creativity.

Embedding this chapter's topic into the overarching theme of the book, I aim in the next section to clarify logical relationships and spell out two notions—spaces of

innovation and milieus of creativity. It is followed by a statement of basic assumptions about the nature of innovativeness and knowledge creation that matter with spatiality. I thereafter emphasize the facets that are the most relevant for considering innovativeness in a regional context and explore their conceptual dimension, outlining approaches that characterize ideal-type relationships of innovativeness and regional development. Attention then briefly turns to the difficult methodological task of empirically capturing the role that regional contexts have in processes of innovativeness and knowledge. The chapter closes with conclusions and open questions.

Spaces of Innovation and Creative Milieus: Mutual Dependencies

The question of how innovative spaces relate to milieus of creativity requires reflection on the fundamental logics of both notions. An additional complication is the fact that the term *creative milieu* can be associated with both a given conceptual framework (elaborated below) and a more common, rather broad definition as a socially and/or spatially constructed relational setting that is particularly conducive to creativity. This section draws more on the latter, less specific interpretation than on the former variant.

What sets creativity apart from innovativeness? The answer varies from one scientific discipline to the next. The definition that economists tend to offer, especially when it comes to creativity, differs from that by, say, psychologists (who look mainly at the individual level, though they do acknowledge the influence of social and cultural frameworks; see Amabile, 1996; Csikszentmihalyi, 1997). In this chapter's context of regional economic development, the two stances have common ground in that they resort mostly, albeit not necessarily, to interactive processes that produce previously nonexistent outcomes. They both express an attribute that may be ascribed to individuals, groups, or organizations. Creativity, however, subsumes a wider category than innovativeness; it includes any new combination of assets and ideas and the results of that combination (Buttner, 1983). Innovativeness, by contrast, encompasses only certain manifestations of creativity: the generation of new processes and new commercially tradable products, of modes of organization, and of markets (as commonly stated by economists).

Accordingly, all innovations require some kind of creativity, whereas creativity may lead to a range of outcomes larger than just innovations. For example, creativity is necessary when one needs to solve an emergent problem of regional development, such as the sudden withdrawal of a major industrial investor. The response requires a collaborative search by various actors to find a feasible solution by creating sets of ideas and concepts for new developmental perspectives. The resulting suggestions, however, cannot actually be called innovations. Yet innovativeness may form part of the solution, for some ideas that develop in the creative process probably encourage the formation of new companies and the development of new

products in existing ones. In fact, most economic geographers and economists usually mistake innovativeness for creativity, often blurring the difference between the two (see, for instance, Cooke & Schwarz, 2007; Malecki, 2000).

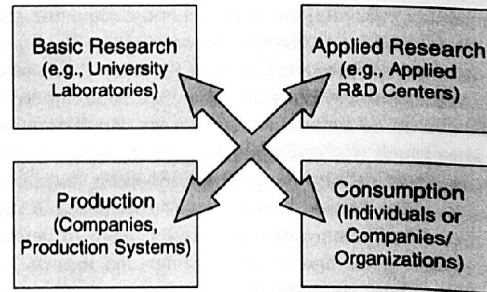
An even more discriminating take on creativity and innovativeness arises from the dissimilar functions that diversity and dissent have. As stressed in psychological research (Csikszentmihalyi, 1997), creativity (whether of individuals or social groups) essentially issues from dissenting ways of thinking and acting and from actors who deviate from common trajectories. By contrast, the objective of being economically innovative requires a range of actors to move collectively toward common goals and to share values and aspects of identity (Fromhold-Eisebith, 2004). These commonalities are understandably necessary to make ends meet, that is, to proceed from complex negotiations between actors to clear-cut innovations, but they also limit creative freedom (a contradiction debated in Jekel & Fromhold-Eisebith, 2003).

The notions of innovative spaces and milieus of creativity should not be regarded as synonymous but rather as different from and related to each other in certain ways. For example, just as creativity constitutes a category broader than innovativeness, spaces are units wider than milieus. The word *space* may refer to a supranational, national, regional, or local unit (which all of consequence for innovativeness). It can also denote any combination of those scales simultaneously (Massey, 2005; Meusbürger, 2008), depending on the phases of an innovation process. A *milieu* is a unit below the national level because its size is fundamentally determined by social relationships whose density and intensity depend on the potential for face-to-face contact, on accessibility, and, hence, on proximity (Fromhold-Eisebith, 1995). Accordingly, scale, social underpinnings, and the importance of proximity distinguish creative milieus from innovative spaces, although both terms relate to functional, not normative units. *Innovative spaces* comprise *creative milieus* (but extend beyond them spatially). *Innovative milieus* (spaces in which innovations are actually produced by locally collaborating actors) form part of creative milieus (with various kinds of new outcomes emerging from the interaction of local actors). Whether there is something like a creative space, however, depends on the interpretation of space. A creative space should be thought of as a local-regional unit, as a level at which the social interaction necessary for creativity can be fulfilled. Creative spaces at macrolevels are hardly imaginable.

Basic Assumptions About Innovativeness and Knowledge Creation

Spatial differences in innovativeness can be partly due to basic modalities of the innovation process. The successful development and marketing of new products or processes is all but impossible without a number of activities and organizations, ideally ones linking inventors, applied researchers, commercial producers or service providers, and consumers (see Fig. 10.2). Given the continuously interactive, rather

Fig. 10.2 Interactive innovation model—interdependent activities and actors



than simply linear nature of the innovation-related connection between these actor groups (Malecki, 1997), actors profit from proximity. One may therefore assume that the basic reliance of innovation on various forward and backward feedback loops between different contributors is best served when relevant organizations are colocated, with urban agglomerations being particularly fertile soil for constant innovativeness (Lambooy, 2002; Malecki, 2000; Simmie, 2003). Frequently, urban agglomerations also figure as functional and political centers and as centers of power, statuses that make them especially attractive to carriers of knowledge (Meusburger, 1998, 2000, 2008).

These observations are further corroborated by the realization that innovation processes rarely, if ever, occur in isolation. Most innovations are incremental rather than radical; they are considerable improvements on preexisting items instead of completely newly invented ones. They are part of a wave, a veritable swarm of interconnected innovations that together constitute a technological paradigm or trajectory (Cimoli & Dosi, 1995). In all probability, then, places of previous innovations also generate derived improvements, adding to spatially demarcated patterns of economic creativity (Fuchs & Shapira, 2005).

However, the assumption that communication needs make the innovation process depend on collocation, agglomeration, and proximity is assailable (Morgan, 2004). Proximity has various meanings and can exist even between partners who operate far away from each other. The word can convey not only physical but also social, organizational, or cultural closeness that may bridge wide geographic distances and animate innovation-related interaction. Direct collaboration during the innovation process may not be frequent enough to require collocation. Researchers, for instance, can easily travel to colleagues whenever deemed necessary. Innovativeness, too, is connected to certain places (Brown & Duguid, 2002; Malecki, 2000; Morgan, 2004; Simmie, 2005).

One basic assumption relates to types of knowledge that may be entailed when companies innovate. Different kinds of knowledge appear to be bound to a locality to different degrees. A distinction is commonly made between codified and noncodified (tacit) knowledge (although such simple dichotomies do not suffice to capture ambiguous, dynamic, and complex realities; see Schamp & Lo, 2003; Meusburger, 2008). Codified knowledge is manifested in texts and graphs and is

easily transferable over great distances, whereas noncodified knowledge is regarded as being firmly embedded in people's minds and linked to experience, requiring face-to-face communication if it is to be shared and creatively recombined (Howells, 2002). Correspondingly, innovativeness draws on collective knowledge (such as that present in working groups) rather than on individual knowledge, which often calls for at least temporary collocation (Grabher, 2004). Recent discourse on knowledge foundations of innovativeness has introduced another category that initially appears to link relevant processes even more closely to places of copresence. Amin and Cohendet (2004), for example, distinguish between people's acquired competencies (possessed knowledge) and so-called practised knowledge or knowing (everyday routines of communities linked to cooperative practices of people). Paradoxically, however, this debate increasingly stresses the spatial volatility and mobility of knowledge and denies its place-bound nature. It posits spaces of knowledge as:

organized spaces of varying length, shape, and duration, in which knowing, depending on circumstances, can involve all manner of spatial mobilizations, including placements of task teams in neutral spaces, face-to-face encounters, global networks held together by travel and virtual communications, flows of ideas and information through the supply chain, and transcorporate thought experiments and symbolic rituals. (p. 12)

Although Amin and Cohendet's viewpoint undermines simple assumptions about the geography of innovation, it dialectically establishes a new perspective on spatial determination that is more consistent with the spatiotemporal nature of knowledge production and application than earlier conceptions of spaces of knowledge are.

Embedding Innovativeness in a Regional Context

Beyond the terminological debate, several arguments support the assumption that innovativeness, in at least some phases of the innovation process, is partly fostered by regional features (Malecki, 1997, 2000; Morgan, 2004; Schamp & Lo, 2003; Simmie, 2005). In this respect, too, fundamental relationships exist between creativity and knowledge on the one hand and place-specific assets and advantages of proximity on the other hand (see Meusburger, 2008). The following six aspects are mostly emphasized by regional scientists and economic geographers.

First, economic theory holds that spatial concentrations of innovative activity are favored by conventional agglomeration economies and externalities and by related institutional frameworks that prevail in urban regions (Gordon & McCann, 2005; Lambooy, 2002). The collocation of various innovation-oriented organizations helps cut costs and gradually makes the entire setting evolve toward a suitable framework for specialized economic activities. Important factors are the existence and improvement of higher education and R&D infrastructure, the specialization of labor markets, and the adjustment of the regional industry mix to the needs of emerging lead activities. This seedbed encourages both the innovativeness of existing firms (first phase of the product life cycle) and the creation of new enterprises.

Second, processes governing the transfer of technology from academia and R&D laboratories to nearby industries are crucial and presumably at least somewhat sensitive to spatial proximity. Forms of cooperation such as joint R&D projects, consulting services, and the provision of human capital are seen as key inputs into regional innovativeness (Feldman & Desrochers, 2003; Malecki, 2000). Entrepreneurship spinning off from universities appears to be strongly oriented to the locality of the academic incubator, substantiating the widely known idea of a triple helix consisting of productively interacting academia, industry, and policy.

Third, the very collocation of firms, the sheer fact of "being there," is assumed to foster knowledge spillover that triggers innovative activity other than direct collaboration. By observing competitors nearby, by receiving fresh stimulus from labor market fluctuations, or by picking up interesting gossip (local buzz; Storper & Venables, 2004), companies may become inclined to venture into new directions, as others have before them (Audretsch & Feldman, 1996).

Fourth, residential proximity allows executives or staff of different firms to build up social relationships and trust based on casual face-to-face contact. This kind of communication amplifies private and informal ties, which amalgamate with and solidify professional collaboration (Fromhold-Eisebith, 2004; Malmberg & Maskell, 2002). Socially embedded interaction and learning can thus easily proliferate in the local community of firms. Their spread creates collectives marked by shared interests, values, and conventions—in sum, by "untraded interdependencies" (Storper, 1995), which substantially help vertically collaborating industrial partners develop flexible specialization and gain networking advantages. Consequently, particular "cultures of regional knowledge" closely linked to certain places emerge (Malecki, 2000).

Fifth, the self-reinforcing and cumulative nature of economic creativity keeps it rooted in certain places, continuity that is consistent with the intrinsically evolutionary character of innovativeness depicted above. The interconnectivity of innovation-related actions can be interpreted in different ways. One can say, for instance, that consecutive waves of new products or processes build upon each other and form technological trajectories over time (Cimoli & Dosi, 1995). In terms of time-space, sectorial and regional polarization concentrates factors, assets, and competence in certain centers and withdraw them from the periphery (Perroux, 1955). Yet another stance is that R&D investment cycles perpetuate the dominance of outstanding innovation centers, with the capital for continued R&D investment coming from those who earn from innovation (Simmie, 2005).

Sixth, policies that promote innovation eventually exert location-specific influence that shapes spatial patterns of knowledge production and application (Sternberg, 1998). The regional impact of policy can be quite explicit, as when local new R&D infrastructure is built or when regionally oriented promotion schemes are established. There are also implicit spatial effects of policy, as when it essentially pursues wider national goals of supporting certain kinds of innovative activities (e.g., in the defense sector or other high-tech fields) but proves to favor particular regions because they have sectorial concentrations in precisely those spheres.

Although these arguments seem persuasive enough to buttress geographical explanations for the emergence of limited sets of innovative spaces and regional

knowledge economies, critical questions and caveats must be mentioned. Most of the stated assumptions are far from being unequivocally confirmed by empirical evidence. Answers to the following sets of open questions are especially uncertain.

First, to what extent does innovation really require interorganizational collaboration rather than the exploitation of a company's internal competencies? How effectively do unintended spillovers of local knowledge actually facilitate innovativeness? And is it legitimate to make such general assumptions given the heterogeneous nature of innovation behaviors exhibited by different types of firms (e.g., small firms as compared to large multinational players)? Is innovation-oriented interaction between firms or between firms and academia really nurtured by spatial proximity? If not, what other factors or kinds of proximity—organizational, social, cultural, or epistemological—potentially foster collaboration? Apparently, the term sometimes relates not to a clearly defined space in which interaction actually takes place but rather to a space of contact potential—contact that may or may not be used in the innovation process. Often the requirement of proximity does not refer to actors' mutual relationships but rather to the shared endeavor to be near a common source of reputation, such as a renowned research laboratory specializing in a field of technology (Meusburger, 2008).

Given the temporary nature of creative activities as projects, another acute question arises: For which phases or tasks in the innovation process is the relevance of proximity greatest? The debate over this issue in economic geography (Amin & Cohendet, 2004; Malecki, 1997, 2000) may also profit from insights offered by organization sociology (Mintzberg, 1979) and educational or social geography (Meusburger, 1998, 2000, 2001, 2008). The degree to which innovating companies need to draw on nearby knowledge partners appears to depend mainly on four factors.

- *The scope of autonomy and leadership qualities of the firm.* A global market leader and prime mover of innovativeness usually requires less external and, in particular, less local interaction with knowledge providers than a follower company.
- *The stability and dynamics of the operative environment.* In sectors with a rather stable, reliable framework for competition, firms appear to need less interaction with partners than in sectors operating under highly volatile, competitive conditions.
- *The age of an organization, a product, or a relationship.* In the phase of a firm's creation or at the start of a new product life cycle, companies tend to require more options for spontaneous face-to-face contact with knowledgeable partners nearby than in more mature stages of production and operation. The proximity of innovating actors is important mainly in the early stages of business relationships in order to overcome uncertainty and to build trust, whereas long-standing links based on trust may function across longer distances as well.
- *The orientation, planning, or purposes of operational routines.* As confirmed by research on the contact requirements of various office functions, local collaboration and information exchange seem to be of more consequence in orientation and planning than in the purposes of operation (see Goddard & Morris, 1976; Meusburger, 2008).

These suppositions are plausible, but remain debatable. With globalization and the growing influence of globe-spanning knowledge flows between branch locations of multinational companies, does local collaboration really matter more than national and international interaction, such as that of connecting sector-specific pockets of innovation all over the world? Considering the evolutionary nature of relevant processes, it is crucial to improve the understanding of what the starting points or initial events are and what the chief institutions, actors, or firms are that trigger self-reinforcing innovation-driven economic development at a location. Why do some formerly successful localities gradually lose innovative strength, whereas selected new technology regions emerge as hubs of innovation by venturing to open locational windows of opportunity (Fuchs & Shapira, 2005)? There is also the practical question of why regional knowledge-based, innovative interaction between firms or between academia and industry is often so difficult to promote effectively.

Economic geographers are still trying to shed additional light on these issues. There is a trend toward taking immaterial and soft factors into account. Researchers now even ask whether and how discourses on and perceptions of the knowledge economy influence the innovation behavior of actors and related spatial patterns. The attention to these aspects reveals traits of a cultural turn in economic geography (Coe et al., 2007), a shift that opens avenues for inspiring collaboration, especially with the social or cognitive sciences.

Conceptualizing Innovation-Oriented Regional Development

The preceding arguments concerning the spatiality of innovation processes have informed various concepts that serve as guidelines for researching and cultivating regional knowledge economies. These concepts, many of them having ideas in common, are logically consistent sets of assumptions about pivotal facets of innovation-oriented local development. They may therefore be subsumed under the overarching label of "territorial innovation models" that have logical and evolutionary links connecting various notions (Moulaert & Sekia, 2003). Only a few essential characteristics of the most popular concepts can be outlined in the following paragraphs of this section (which also contain important references for further reading). Although the focus and perspective of these approaches vary somewhat, all of them underscore the value of actor relationships for the regional embedding of innovativeness.

Clusters

The concept of clusters (and the related one of industrial districts) draws on basic ideas introduced by Alfred Marshall in the 1920s. It relates primarily to

agglomeration and networking advantages expected from local concentrations of firms and other organizational arrangements (higher education, R&D, and public agencies) that belong or cater to the needs of the same sectorial group and the same kind of value chain (Porter, 2000). It is assumed that one can create specific assets on the spot by linking complementary and competing actors who operate in the same technoeconomic field and by jointly marketing that particular strength to the outside world. Major assets are collective innovativeness, the sharing of inspiring information, and other positive outcomes, such as joint initiatives in staff training, supply and service purchasing, and systemic marketing. The cluster notion has elicited more criticism among researchers and more enthusiasm among regional policy-makers than almost any other development model has (Asheim et al., 2006; Martin & Sunley, 2003). Its emphasis on shared interests, homogeneous goals, and joint action runs counter to the quests for diversity and dissent associated with the notion of creativity (Meusburger, 2008).

Innovative, or Creative, Milieus

The concept of innovative, or creative, milieu was established by a group of European scientists who investigated different types of regions on the basis of a shared conceptual and methodological framework (Aydalot, 1986; Ratti et al., 1997). The purpose of the concept is to spell out favorable conditions for corporate innovativeness. It attributes great influence to key actors' local interactions based on preexisting informal personal relationships. Innovation-enhancing creativity is said to derive partly from new combinations of previously separate regional knowledge assets embodied by the various participating actors (who represent firms, R&D laboratories, and other organizations) and partly from the social and professional interaction of those actors. It is the informal-cum-formal nature of relationships that provides a seedbed particularly conducive to socially embedded learning and collective innovativeness based on mutual trust, common developmental objectives, and shared values (Camagni, 1991; Fromhold-Eisebith, 1995, 2001, 2004). The concept offers a convincing set of suppositions, but it is hard to use as an analytical tool or policy guideline. Its merits lie in highlighting the significance of social and soft assets as foundations of regional knowledge economies.

Regional Innovation Systems

The notion of regional innovation systems encompasses all the actors and processes that affect industrial innovativeness at a locality. It is assumed that regions are distinguished by place-specific constellations of organizations, institutions, regulations, and interactions that shape the production and application of knowledge (Cooke, 1992; Cooke et al., 2004). Consequently, basic conditions, major dynamics, and supportive frameworks of industrial innovativeness are said to exist mainly on a

regional scale (as opposed to a national system of innovation; Lundvall, 1992). By incorporating features of political regulation, R&D infrastructure, and patterns of collaborative relationships between business actors at a locality, the concept of a regional innovation system is an attempt to integrate all leading determinants of corporate innovativeness. It may be used analytically to characterize regional settings or normatively to suggest actor and policy constellations that appear to be the most conducive to regional innovativeness. Such assessment of innovation policies, however, requires consideration of national and international system scales as well (Fromhold-Eisebith, 2007).

Learning Regions

As a response to a range of basic ideas for a fruitful combination of regional interaction and knowledge-driven industrial development, the concept of the learning region centers on sets of interdependent evolutionary dynamics (Hassink, 2001; Morgan, 1997). More visionary than analytical, the idea is to establish localized capabilities for collectively organizing the continuous combination and recombination of internal and external knowledge. Regions are expected to act like organizations that manage knowledge acquisition and innovation-oriented uses in well-conceived ways. It is suggested that progress results from constant learning processes that connect firms, academia, and industry. The concept also expediently combines inflows of know-how with the local circulation and exploitation of newly acquired knowledge.

Knowledge Regions

The knowledge region is one of the most recent conceptual inventions in the field and stems mostly from regional policy makers and academics. It, too, serves as a guideline for regional promotion rather than as a descriptive or analytical tool. Knowledge regions are ostensibly spatial entities that are marked by a conscious regard for the creation and use of knowledge in all aspects of regional development (Buschmann, 2005). Unlike earlier concepts, that of the knowledge region includes increases in awareness and activity within the population at large, so it extends beyond the sphere of firms and other organizations. Because knowledge-oriented dynamics are broadly based, regions are expected to attract international attention as well.

Shadow Catching: Trying to Capture the Essence of Innovative Spaces Empirically

Despite the lively debate on determinants of innovation-oriented regional development and a range of publications that map and collect statistics on spatial differentiations of innovativeness (Malecki, 2000; Pro Inno Europe & Innometrics,

2007), relevant processes, interdependencies, and causal relationships are difficult to discern through empirical research. Case studies and narratives abound, but little thorough empirical work representing an attempt to confirm general assumptions on a relatively wide basis. One reason is that the idiosyncratic nature of regional knowledge-driven developments obscures overarching principles (Simmie, 2005). Each region is known for specific constellations of actors, activities, and agency—as communicated by the notion of regional innovation systems. Because of the complex patterns of self-reinforcing systemic processes and the unpredictable social dynamics involved, even similar initial conditions of regions that have been compared may eventually have quite different outcomes. Moreover, structural settings that truly allow for scientifically sound comparison are rare. Investigated regions therefore inevitably fall into different categories. Even when this variegation is taken into account, valid generalizations are highly elusive, as shown by comparative research on innovative milieus (Ratti et al., 1997) and regional innovation systems (Cooke et al., 2000).

In this section, I illustrate the complications of providing evidence for key determinants of innovative spaces when it comes to regional knowledge-intensive collaboration, which is assumed to be a principal anchor of the processes involved. Empirical research by economic geographers studying this topic have so far mainly addressed two things: the importance of regional as opposed to extraregional relationships for corporate innovativeness, and the role of regional institutional constellations in affecting the innovation behavior of firms. Achievements and shortcomings will be briefly discussed for two recent large-scale empirical projects, the European Regional Innovation Survey (ERIS), conducted by a German team (Koschatzky & Sternberg, 2000; Revilla Diez, 2000, 2001, 2002), and the international project entitled Regional Innovation Systems in Europe (REGIS) (Cooke et al., 2000; Tödtling & Kaufmann, 1999).

Both ERIS and REGIS aim to broaden insight by including fairly large numbers of regions and informants. Through postal questionnaire surveys, ERIS has encompassed 8,600 organizations, including 4,200 manufacturing firms, in 11 regions of the European Union. REGIS has gathered information on 833 firms in another set of 11 EU regions. The written surveys have been complemented by personal qualitative interviews. A standard objective has been to gain understanding of the role and spatial reach of collaboration in the context of innovation, particularly with respect to links to customers, suppliers, academia, R&D organizations, and other actors. In order to find out whether regional interaction really matters, researchers have compared the relative shares of regional, national, and international collaboration, providing a predominantly quantitative picture of relational orientations that respondents have. The spatial nature of relational systems has also been interpreted by means of interregional comparison. In addition, performance indicators of regionally collaborating firms have been compared with those of noncollaborating ones in order to detect significant and meaningful discrepancies.

But what have these efforts actually revealed? Most regional shares of collaboration have not been remarkably large relative to national and international links. The overall results have been quite mixed with regard to dominating scales

of interaction. But low relative shares of local collaboration do not necessarily suggest that regional embedding is irrelevant; local partners in small numbers, too, may provide vital support to a firm. What the studies show is that small firms in particular are biased toward local relationships and that the firms which are generally more "cooperative" (though not necessarily in a regional sense) appear to have experienced more innovation-related success than the less integrated ones (Cooke et al., 2000; Revilla Diez, 2002).

These findings may not be fully convincing in light of theoretical and conceptual reasoning on regional knowledge economies. Whatever the case, both projects have a few notable shortcomings relating to basic obstacles faced by any regional researcher who tries to approach the issue empirically. One problem is associated with the task of suitably demarcating the right "region" to be studied. What type of region fits to the space of innovation being sought: one defined by administrative (official) or rather by functional (interaction-related) boundaries? Are compared regions truly comparable in size, institutional and economic structure, administrative competencies, and other features?

A second drawback has to do with the question of causality—in this context, the correlation between collaborative behavior and the innovative performance of firms as mentioned above. Are companies innovative because they collaborate with others (as theory suggests), or do they collaborate because they are innovative and generally more dynamic, like extroverts (Malecki & Poehling, 1999)? This question cannot be satisfactorily answered until logical links between interaction patterns and the dynamics of firms are explicitly explored (ideally by qualitative personal interviews).

Third, shares of local innovation-oriented relationships have not been adequately interpreted against the backdrop of institutional options for collaboration in specific industries and regions. When low shares of collaboration are recorded in a region, one reason may be that there is not much local embedding (as argued in some studies). Alternatively, it could simply be that the region lacks potential partners because it does not offer sufficient scope for local networking. In either case, conceptual interpretations and policy implications may have to change.

Lastly, social dimensions of spaces of innovation, which are important glue that makes knowledge (in the form of knowledgeable people) stick to a place, have been somewhat neglected by large-scale empirical projects (Malecki, 2000; Meusburger, 2008). Future research must vastly increase the attention devoted to the social underpinnings of observed patterns of innovative interaction and knowledge exchange.

Conclusions and Open Questions

The argumentation of economic geographers and regional economists who write about spaces of innovation and regional knowledge economies shows that the spatiality of such phenomena has been well perceived and taken as a challenge

to scientific reasoning and application-oriented research. But despite convincing assumptions about the role of regions and proximity for innovativeness and the knowledge economy, there is still too little known about the actual mechanisms of creating and using interactive knowledge in and across regions. People know they are living in a space of interrelated and internally networked innovative places, in an "archipelago of situated knowledges" (Thrift, 1999, p. 303). But they are still searching for robust insights into relevant geographies of processes, innovation phases, and time, including the spatial nature and dynamics of innovation-oriented "project ecologies" (Grabher, 2002).

We researchers have immense difficulty empirically capturing general and overarching features that characterize spatial patterns of knowledge-based processes and geographical sides of actor behavior. We must probably keep relying on individual case studies about regions, organizations, and institutions because the path to theory-oriented generalizations is essentially blocked by the complex idiosyncrasies of the locational dynamics governing economic, social, cultural, technological, and political factors that bear on regional innovativeness.

Other disciplines can assist well with the geographer's tasks, affording welcome inspiration and methodological resources, especially for the following open questions:

- In what respects does individual or team creativity aggregate to regional innovativeness? How can insights from psychology or the cognitive sciences inform geographical views on regional innovation? To make progress in these areas, it would be useful to learn more about the contexts that encourage individual creativity and about the ideal size and other social-group factors of creative, innovative teams.
- How do cultural characteristics and ethical norms contribute to the regional creation and economic application of knowledge? Approaches and findings of sociology, philosophy, or anthropology could help explain such influences.
- With which methodological approaches can researchers empirically capture the spatiality, relational aspects, and regional embedding of innovativeness more adequately than has been the case thus far? In all disciplines, whether quantitatively or qualitatively oriented, this question pushes the range of applicable methods to its very limits.
- What means of promotion can proliferate innovativeness beyond large urban agglomerations toward more peripheral regions? This issue deserves additional joint exploration by economic geographers, political economists, political scientists, and others scholars.

Economic geography, although offering some meaningful insights into regional milieus of economic creativity, inevitably has a few weaknesses in its research perspectives and procedures. They reveal that we researchers need to learn from other views or approaches and to continue widening our horizons of reasoning. May this chapter open avenues for increased interdisciplinary collaboration in this realm.

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Chapter 11

The Unconscious City: How Expectancies About Creative Milieus Influence Creative Performance

Jens Förster

Paris: City of love. New York: The city that never sleeps. Hamburg: The Reeperbahn. Jerusalem: The Holy City. These pairings are only few examples of specific contents people associate with cities or other places. True or not, correspondences of this kind are represented in memory and may pop into mind when people are asked about their knowledge of certain cities. For example, if you are asked to tell a friend what you think about New York, you may recall the many galleries in Chelsea, the roaring nightlife and the clumsy, Woody-Allen-like neurotic genius who avoids your glances.

Over the last decades, researchers in social psychology have made enormous progress in understanding how these sorts of stereotypes are represented in memory (e.g., Collins & Loftus, 1975; Higgins, 1996; Higgins et al., 1977; Huber et al., 2001; Wyer, 2004; Wyer & Radvansky, 1999). More relevant for this chapter, social psychology shows that representations of this nature influence people's feelings, thinking, and behavior (for reviews, see Dijksterhuis & Bargh, 2001; Förster & Liberman, 2007). Maybe the most provocative insight from this research is that representations like these can influence the behavior of people even without them knowing or desiring it (Moskowitz et al., 2004). Such outcomes are called "priming effects." I first summarize classic research focusing on human judgments and behavior and suggest that even creative thinking can be affected by unconscious activation of stereotypes. I then outline research that social psychologists have conducted on creative thinking and continue by arguing that some cities are associated with creativity. I suggest that such thinking works like a self-fulfilling prophecy, that is, that the creativity of people increases when they are reminded of a creative place. I then recount an experiment in which undergraduate participants were exposed to the names of particular cities so briefly that conscious recognition of

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