

Annuaire des Sciences Administratives Suisses  
Yearbook of Swiss Administrative Sciences

**J A H R B U C H**  
der Schweizerischen Verwaltungswissenschaften

**2 0 1 6**

**SGVW | SSAS | SSSA**

Schweizerische Gesellschaft für Verwaltungswissenschaften  
Société Suisse des Sciences Administratives  
Società Svizzera delle Scienze Amministrative  
Swiss Society of Administrative Sciences

## Ambidextrous personal networks

### Organizing the university for innovation-oriented and refinement-oriented relationships

*Georg Reischauer*

*Research Cluster Organization, Management, and Leadership, Hertie School of Governance, Berlin, Germany*

**How can a university stimulate knowledge creation in light of competing sources of knowledge? This paper directed at practitioner in research support and university management addresses this question with the concept ambidextrous personal networks that centres the relationships of researchers. It suggests to encourage researchers of a university to maintain a balance between two types of relationships. Innovation-oriented relationships denote relationships with persons from disciplines other than those a researcher was trained in and with practitioners of industries that are close to the researcher's discipline. These relationships prompt innovative knowledge. Refinement-oriented relationships, in contrast, are relationships with researchers from the same discipline. These relationships prompt refined knowledge. Ambidextrous personal networks are implemented through the university's organizational form, which is the ensemble of rules and activities that provide researchers with basic guidelines for acceptable behaviour. To support the implementation, a framework that covers key dimensions of an organizational form – boundary-crossing relationships, formal organization, activities, workforce composition, and organizational culture – is outlined.**

**Keywords:** innovation, knowledge, networks, university management

#### 1 Introduction

A highly relevant domain of the public service is higher education. Its key societal function is the creation of knowledge (Välilmaa & Hoffman, 2008) that has both commercial value and solves pressing scientific problems (Ambos et al., 2008; Perkmann et al., 2013; Rothaermel et al., 2007). Knowledge creation has long been conceived as exclusive capability of universities. This exclusivity however has been questioned by the emergence of competing sources of knowledge such as users and shifting societal expectations towards the role of universities (Berman & Paradeise, 2016; von Hippel, 2005). Universities have cut costs, promoted entrepreneurial orientations, increased administrative control, as well as implemented tools and concepts from the business domain to respond to this change (Berman & Paradeise, 2016). Also new forms of universities, especially universities of applied sciences, have emerged. However, limited attention has been paid to how a university may stimulates knowledge creation in light of competing sources of knowledge.

To address this question, this practitioner paper synthesizes key insights from organization theory (Gibson & Birkinshaw, 2004; March, 1991), innovation network theory (Johnson, 2009; Zheng, 2010), and recent studies at the intersection of these two theories (Ambos et al., 2008; Dittrich & Duysters, 2007; Kang & Snell, 2009; Rogan & Mors, 2014) towards the concept ambidextrous personal networks. It is argued that a university should encourage its researchers to maintain a balance between two types of relationships. Innovation-oriented relationships denote relationships with persons from disciplines other than those a researcher was trained in and with

practitioners of industries that are close to the researcher's discipline. These relationships prompt innovative knowledge. Refinement-oriented relationships, in contrast, are relationships with researchers from the same discipline. These relationships prompt refined knowledge. Balancing these two types of relationships creates ambidextrous personal networks. To put ambidextrous personal networks into action, an implementation framework that focuses the organizational form of a university, i.e. the ensemble of rules and activities that provide researchers with basic guidelines for acceptable behaviour, is suggested. It covers the dimensions boundary-crossing relationships, formal organization, activities, workforce composition, and organizational culture.

The key contribution of ambidextrous personal networks lies in its practice-oriented and comprehensive approach that centres the most important knowledge-creating resource of universities, researchers. More precisely, it focuses how the individual level of knowledge creation in universities can be supported while not restricting researchers. This focus reflects the fact that researchers are relationships-intensive knowledge workers (Brown & Duguid, 2001) and that knowledge workers demand a specific work environment (Frost et al., 2010). In linking key insights from organization and innovation theory in the context of higher education and focusing on the practical application of these insights, the concept seems especially useful as tool for practitioners in research support and university management and especially for the implementation of the university strategy that is strongly interwoven with knowledge creation and networks (Reischauer, 2014).

The paper is structured as follows. The next two chapters outline the theoretical background, ambidexterity and personal networks. Whereas ambidexterity clarifies the outcome of knowledge creation in a stimulating context and thus the 'what happens', personal networks detail the facilitating factor of knowledge creation and thus the 'how it happens'. Combining these insights results in the concept of ambidextrous personal networks that is outlined and illustrated with empirical examples. The paper closes with remarks on implementation.

## **2 Ambidexterity: Innovation and refinement as outcome of knowledge creation in a stimulating context**

This section elaborates on the basic idea of encouraging researchers to create knowledge that is both innovate and refined. The dual focus on two different kinds of outcomes results from ambidexterity, a key concept in management research (Lavie et al., 2010). Ambidexterity rests on the idea popularized by March (1991) that there are two basic types of activities within an organization: exploration and exploitation. Exploration describes activities such as "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991: 71). Examples for a university are studies on emerging phenomena or new technologies. Exploitation, on the other hand, describes activities such as "refinement, choice, production, efficiency, selection, implementation, execution" (ibid.). For a university, consider the example of research on established phenomena or the replication of existing studies. As Lavie et al. (2010) argue, these two activity types present the endpoint of a continuum and are no discrete options. However, the trade-off between exploration and exploitation – or innovation and refinement – requires a balance. Ambidexterity refers to the ability to sustain this balance and thus to create both, innovation and refinement. Several studies have highlighted the positive impact of ambidexterity on performance (Junni et al., 2013).

A key area to which ambidexterity has been applied that is of major importance for this paper is organizational design (Lavie et al., 2010). At the centre of organizational design is the organizational form of an enterprise or, in the following used throughout, a university. Organizational form refers the "archetypal configuration of structures and practices given coherence by underlying values regarded as appropriate within an institutional context" (Greenwood & Suddaby, 2006: 30). Put bluntly, an organizational form covers the ensemble of rules and activities of a university that provide especially researchers but also administrative staff

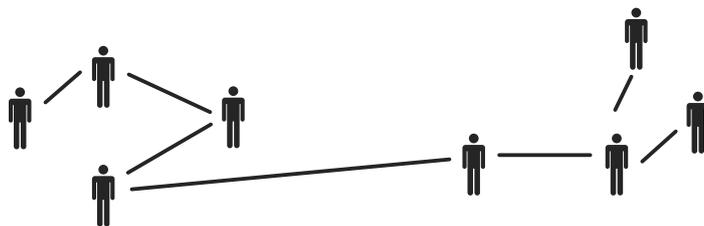
and students with basic guidelines for acceptable behaviour. Ambidexterity as balance between innovation and refinement presents a basic principle to design these rules and activities. For higher education, popular organizational means to support researchers are technology transfer units and formal incentives, the quality of a department, as well as leadership and climate of a department (Perkmann et al., 2013).

There are several perspectives on how to put the basic design principle ambidexterity into action (O'Reilly & Tushman, 2013). This paper draws upon contextual ambidexterity, the most recent perspective developed by Gibson and Birkinshaw (2004). At the heart of this behavioural perspective is the „context that encourages individuals to make their own judgments as to how best divide their time between the conflicting demands“ (Gibson & Birkinshaw, 2004: 211) for innovation and refinement. Put differently, the context that supports persons to engage in activities that result in innovation or refinement is centred. Contextual ambidexterity is a highly useful perspective for addressing the issue of how to organize knowledge creation at universities for two reasons. First, the focus rests on the context that an organizational form creates and not the organizational form itself. This takes into account that universities are characterized by different activities that, unlike an enterprise, are typically not linked with each other (Weick, 1976). Second, the autonomy of the individual researcher is taken into account. This reflects the fact that researchers can be considered as knowledge workers (Brown & Duguid, 2001) that demand a specific kind of work environment (Frost et al., 2010).

### 3 Personal Networks: Relationships as facilitator of knowledge creation

Having elaborated on the goal to create a context that encourages researchers to create innovative and refined knowledge, in the following a key means to achieve this goal is outlined: Personal networks (Johnson, 2009; Perry-Smith & Shalley, 2003). Personal networks consist of two basic properties, relationships and persons. Relationships link individuals with each other and are, borrowing from Podolny (2001), the pipes through which knowledge flows. Persons are both the sender and receiver of knowledge that flows through relationships and thereby also create new knowledge (Johnson, 2009). Figure 1 visualizes a fictive small personal network. Especially in higher education relationships are not only formed with researchers from the same university but also with researchers from other universities and, increasingly, also other disciplines (Cummings & Kiesler, 2005; McFadyen & Cannella, 2005). Joint papers or joint research projects with researchers from different universities exemplify this point. Moreover, also relationships with practitioners from the industry that is close to one's discipline have become more common (Perkmann et al., 2013; Rothaermel et al., 2007).

Figure 1: Personal network (Adapted from Reischauer, 2015: 53)



How do personal networks facilitate knowledge creation? For the purpose of this practice-oriented paper that neither discusses social network analysis – the research method to empirically analyse personal networks (Wasserman & Faust, 1997) – nor the structural dimension of networks (Nahapiet & Ghoshal, 1998) – the analytical dimension that corresponds with this method –, this question can be addressed by highlighting the role of two basic relational factors

(Zheng, 2010): trust and norms. Both tend to have a positive effect on knowledge creation. Trusting relationships among persons are likely to initiate joint efforts, to create a context that persuades to take risk in knowledge creation, and to “bypass procedures and policies based on formal control systems, as well as allow new ideas and novel methods to be experimented without close oversight” (Zheng, 2010: 170–171). Norms, in contrast, support persons in assessing what behaviour is appropriate and thereby guide behaviour. Bluntly speaking, norms are learnt in interacting with others and thus by building and maintaining personal networks. Creating knowledge presents an uncertain situation in which norms can provide guidance, which is why they provide a valuable function (Zheng, 2010).

In addition to these two relational factors, also knowledge heterogeneity matters. In principle, relationships that exchange heterogeneous knowledge are more likely to yield to innovation compared with relationships that exchange homogenous knowledge (Rodan & Galunic, 2004). However, the exchange of heterogeneous knowledge tends also to be more complex than the exchange of homogenous knowledge (Cummings & Kiesler, 2005; Park & Leydesdorff, 2010). Thus, heterogeneous knowledge is not per se advantageous.

#### **4 Ambidextrous personal networks: Organizing the university for innovation-oriented and refinement-oriented relationships**

The combination of the outlined insights on ambidexterity and personal networks creates the concept ambidextrous personal networks. Its core idea is that a university should encourage its researchers to maintain a balance between two types of relationships, innovation-oriented relationships and refinement-oriented relationships. *Innovation-oriented relationships* denote connections with persons from disciplines other than those a researcher was trained in and with practitioners of industries that are close to a researcher’s discipline. This focus on unfamiliar relationships reflects the relevance of relationships that contain heterogeneous knowledge for innovation. These relationships prompt innovative knowledge. *Refinement-oriented relationships*, in contrast, are connections with researchers from the same discipline and reflect the relevance of homogenous knowledge. These relationships prompt refined knowledge. Reflecting the importance of the quality of relationships, both relationship types are characterized by an adequate level of trust and an adequate socialization into the norms of a discipline’s knowledge creation. Joint paper and research projects exemplify the adequate level of trust. If a university promotes ambidextrous personal networks, it encourages its researchers to build and maintain relationships with persons that have both different and similar knowledge.

The means to put ambidextrous personal networks into action is the organizational form, i.e. the ensemble of rules and activities of a university that provide researchers with basic guidelines for acceptable behaviour. To detail how an organizational form can encourage ambidextrous personal networks and create “a set of processes or systems that enable and encourage individuals to make their own judgments about how to divide their time between conflicting demands” (Gibson & Birkinshaw, 2004: 210), in the following an implementation framework is outlined. Drawing upon the work of Battilana and Lee (2014) and adapting it to the context of higher education, it encompasses five dimensions that capture key features of an organizational form: boundary-crossing relationships, formal organization, activities, workforce composition, and organizational culture. For each dimension, it is distinguished between measures to stimulate innovation-oriented relationships and refinement-oriented relationships. The remainder of this section elaborates on the framework that is summarized in Table 1. In doing so, throughout examples from university engagement are used (Perkmann et al., 2013; Rothaermel et al., 2007).

**Table 1: Implementation framework**

Dimension	Encouraging innovation-oriented relationships	Encouraging refinement-oriented relationships
Boundary-crossing relationships	<ul style="list-style-type: none"> <li>Promotion of inter-disciplinary and university-industry projects</li> </ul>	<ul style="list-style-type: none"> <li>Promotion of intra-disciplinary projects and university-university projects</li> </ul>
Formal organization	<ul style="list-style-type: none"> <li>Broad theme-centred groups and centres ("Centre of Energy Solutions")</li> <li>Inter-disciplinary networking as part of objective agreements</li> <li>Advisory board with members from close disciplines and industry</li> </ul>	<ul style="list-style-type: none"> <li>Focused discipline-centred units ("Organizational Behaviour")</li> <li>Intra-disciplinary networking as part of objective agreements</li> <li>Advisory board with members from same discipline</li> </ul>
Organizational activities	<ul style="list-style-type: none"> <li>University-wide support for inter-disciplinary and university-industry projects</li> </ul>	<ul style="list-style-type: none"> <li>University-wide support for intra-disciplinary projects</li> </ul>
Workforce composition	<ul style="list-style-type: none"> <li>Recruiting from close disciplines</li> <li>Broad theme-centred workshops ("Interdisciplinary Climate Research Workshop")</li> </ul>	<ul style="list-style-type: none"> <li>Recruiting externals from same discipline</li> <li>Focused Discipline-centred workshops ("Workshop on Publishing in Innovation Studies")</li> </ul>
Organizational culture	<ul style="list-style-type: none"> <li>Broad theme-centred presentation forums ("Innovation in Management and Social Sciences Seminar Series")</li> <li>Focused presentation forums open to the public ("Managing Service Enterprises in the Digital Age")</li> </ul>	<ul style="list-style-type: none"> <li>Focused discipline-centred presentation forums ("Innovation Economics Seminar Series")</li> </ul>

*Note: Examples are given in parentheses*

First, *boundary-crossing relationships* denote relationships of researchers that surpass the boundary of the university. To encourage these boundary-crossing relationships that are likely to yield innovation, the promotion of inter-disciplinary and university-industry projects appear promising. Both other disciplines and the industry that is close to ones' discipline provide heterogeneous knowledge and thus are more likely to yield innovation. To stimulate boundary-crossing relationships that centre refinement, intra-disciplinary projects and university-university projects should be promoted. This allows a focused creation of refined knowledge. For both type of relationships, especially initial funding programs are useful.

Second, the dimension *formal organization* encompasses the sub-dimensions organizational structure, incentives and controls systems, and governance (Battilana & Lee, 2014). Each sub-dimension is able to encourage innovation and refinement. Regarding innovation, the organizational structure can support with broad theme-centred research groups and centres (e.g., "Centre of Energy Solutions"). This breadth approach towards a certain topic allows for the exchange of heterogeneous knowledge. Incentives to create and maintain innovation-oriented relationships can be set by including inter-disciplinary networking in objective agreements. For governance, it is promising to appoint members for the advisory board of a project, institute, centre, faculty, division, or the overall university from close disciplines and the industry. Regarding refinement, the organizational structure is able to encourage relationships through discipline-centred units (e.g., "Organizational Behaviour"). For incentives, the inclusion of intra-disciplinary networking in objective agreements is promising. For governance, advisory boards with members from the same discipline provide a promising stimulus for relationships that create refinement-oriented knowledge.

The third dimension, *activities*, emphasizes the relevance of university-wide activities that support research projects. Researchers interested in starting these projects should have support from the initial phase until the termination phase of this collaboration and, to focus on research,

be partly relieved from administrative aspects. Whereas refinement-oriented relationships are likely encouraged with intra-disciplinary projects, innovation-oriented relationships are triggered by inter-disciplinary and university-industry collaborations. Since this involves the exchange of heterogeneous knowledge that is more complex, it may need special attention regarding conflict resolution and the creation of a shared understanding of a research project's goals.

Fourth, *workforce composition* highlights the relevance of the intellectual background of a researcher to be recruited and the role of professional development. To encourage innovation-oriented relationships, it seems favourable to have a recruiting policy that also considers close and not the same discipline. For professional development, broad theme-centred workshops provide a promising opportunity to exchange heterogeneous knowledge (e.g., "Interdisciplinary Climate Research Workshop"). To stimulate refinement-oriented relationships, the recruiting of externals, i.e. persons that were previously not employed or trained at the university, seems promising. Concerning professional development, discipline-centred training seems likely to foster refinement-oriented relationships (e.g., "Workshop on Publishing in Innovation Management").

The final dimension, *organizational culture*, refers to shared norms and values that emerge overtime. It presents a dimension that cannot be designed but only tried to be shaped (Battilana & Lee, 2014). In higher education, a key occasion where organizational culture promotes the creation and maintenance of relationships are events at which presentations take place. To stimulate innovation-oriented relationships, broad theme-centred presentation forum seem appropriate (e.g., "Innovation in Management and Social Sciences Seminar Series"). Moreover, also presentation forums that are open to the public and include practitioners are useful (e.g., "Managing Service Enterprises in the Digital Age"). To encourage refinement-oriented relationships, focused discipline-centred presentation forums have been found promising (e.g., "Innovation Economics Seminar Series"). Given the informal nature of organizational culture, for all events it is important to provide socializing opportunities and for 'networking' as used in everyday language.

## 5 Conclusion

Directed at practitioners in research support and university management, this conceptual paper sought to address the question of how a university can stimulate knowledge creation in light of competing knowledge sources. Combining key insights in organization and innovation theory, it introduced the concept of ambidextrous personal networks that encourages researchers to maintain a balance between innovation-oriented and refinement-oriented relationships. To implement the concept, a framework that centres the organizational form of a university was outlined and illustrated. The framework is grounded in theory and was therefore not exemplified with a single best practice case. However, universities of applied sciences that have become an integral part of higher education as well as technical universities exemplify several aspects of the framework. Especially the examples on the dimensions boundary-crossing relationships are widespread among these university types.

The framework presents the basis to put ambidextrous personal networks into action. For the implementation process, also the following aspects should be taken account. First, the autonomy of researchers should be intervened into as little as possible. Especially a further bureaucratization of academic life that is already considerable high (Furedi, 2002) should be avoided. Second, ambidexterity cannot be simply set up but is the fragile outcome of a complex process (Zimmermann et al., 2015). For this reason, insights and methods from change management (Kotter, 1996) seem beneficiary when changing the organizational form of a university for ambidextrous personal networks. Third, in adapting the framework to the specifics of a university, a 'one-size-fits-it-all'-approach should be avoided. At least two basic differences in the higher education landscape should be considered. First, the various epistemic cultures (Knorr Cetina,

1999), i.e. the different practices and norms of disciplines, should be taken into account. Ambidextrous personal networks are likely to very much differ between, for example, humanities and the life sciences. Second, attention should be paid to the logics of different university types, especially full university, technical universities, and universities of applied sciences. While, as noted, the latter two types may provide best practice examples, a full university still functions different. Considering these remarks, ambidextrous personal networks appear as promising approach to organize the university for innovation and refinement.

### **Zusammenfassung**

Wie kann eine Universität angesichts konkurrierender Wissensquellen Wissens-erzeugung stimulieren? Der vorliegende, an Praktiker im Forschungssupport und Universitätsmanagement gerichtete Beitrag adressiert diese Frage mit dem Konzept der ambidexteren persönlichen Netzwerken, das Beziehungen von Forschern in den Mittelpunkt stellt. Es wird vorgeschlagen, Forscher einer Universität zu ermutigen, eine Balance zwischen zwei Typen von Beziehungen aufrechtzuerhalten. Innovationsorientierte Beziehungen beschreiben Beziehungen mit Personen von anderen Disziplinen, die sich von der Disziplin des Forschers unterscheiden sowie mit Praktikern aus Industrien, die der Disziplin eines Forschers nahe stehen. Diese Beziehungen regen innovatives Wissen an. Verbesserungsorientierte Beziehungen sind demgegenüber Verbindungen mit Forschern von derselben Disziplin. Sie regen verbessertes Wissen an. Die Implementierung von ambidexteren persönlichen Netzwerken erfolgt durch die Organisationsform einer Universität, verstanden als Ensemble aus Regeln und Aktivitäten, das Forscher grundlegende Orientierung für akzeptables Verhalten bietet. Um die Implementierung zu unterstützen, wird ein Bezugsrahmen skizziert, der Schlüsseldimensionen einer Organisationsform – grenzüberschreitende Beziehungen, formale Organisation, Aktivitäten, Personalzusammenstellung und Organisationskultur – umfasst.

**Schlagworte:** Innovation, Wissen, Netzwerke, Universitätsmanagement

### Résumé

Comment est-ce qu'une université peut stimuler la création de connaissances face à la concurrence des sources de connaissances? La présente contribution destinée à des praticiens occupés par le support de recherche et le management universitaire, adresse la question par le concept de réseaux de personnes ambidextres qui est centré sur les relations des chercheurs. La publication suggère d'encourager les chercheurs d'université à maintenir un équilibre entre deux types de relations. Les relations orientées innovation représentent des relations avec des personnes actives dans d'autres disciplines que celle dans laquelle le chercheur est compétent et avec des praticiens d'industries qui sont proches de la discipline du chercheur. Ces types de relations incitent aux connaissances innovantes. Les relations orientées perfectionnement sont au contraire des relations avec des chercheurs de la même discipline. Ces relations incitent aux connaissances de perfectionnement. La mise en œuvre de réseaux de personnes ambidextres passe par la forme que revête l'organisation de l'université, qui résulte d'un ensemble de règles et d'activités qui fournissent aux chercheurs des indications de base d'un comportement acceptable. Pour appuyer cette mise en œuvre, un cadre qui couvre les dimensions clés d'une forme d'organisation – relations transgressant les frontières, organisation formelle, activités, composition des forces de travail et culture organisationnelle – est esquissé.

**Mots clés:** innovation, connaissances, réseaux, management universitaire

## References

- Ambos, T.C., Mäkelä, K., Birkinshaw, J., & D'Este, P. (2008). When does university research get commercialized? Creating ambidexterity in research institutions. *Journal of Management Studies*, 45(8), 1424–1447.
- Battilana, J. & Lee, M. (2014). Advancing research on hybrid organizing: Insights from the study of social enterprises. *Academy of Management Annals*, 8, 397–441.
- Berman, E.P. & Paradesi, C. (2016). Introduction: The university under pressure, *Research in the sociology of organizations*, 46, 1–22.
- Brown, J.S. & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization Science*, 12(2), 198–213.
- Cummings, J.N. & Kiesler, S. (2005). Collaborative research across disciplinary and organizational boundaries. *Social Studies of Science*, 35(5), 703–722.
- Dittrich, K. & Duysters, G. (2007). Networking as a means to strategy change: The case of open innovation in mobile telephony. *Journal of Product Innovation Management*, 24(6), 510–521.
- Frost, J., Osterloh, M., & Weibel, A. (2010). Governing knowledge work: Transactional and transformational solutions. *Organizational Dynamics*, 39(2), 126–136.
- Furedi, F. (2002). The bureaucratization of the British university. In: D. Hayes & R. Wynyard (Eds.), *The McDonaldization of higher education*, Westport: Bergin and Garvey, 33–42.
- Gibson, C.B. & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226.
- Greenwood, R. & Suddaby, R. (2006). Institutional entrepreneurship in mature fields: The big five accounting firms. *Academy of Management Journal*, 49(1), 27–48.
- Johnson, D.J. (2009). *Managing knowledge networks*. Cambridge: Cambridge University Press.
- Junni, P., Sarala, R.M., Taras, V., & Tarba, S.Y. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, 27(4), 299–312.
- Kang, S.-C. & Snell, S.A. (2009). Intellectual capital architectures and ambidextrous learning: A framework for human resource management. *Journal of Management Studies*, 46(1), 65–92.
- Knorr Cetina, K. (1999). *Epistemic cultures: How the sciences make knowledge*. Cambridge: Harvard University Press.
- Kotter, J.P. (1996). *Leading change*. Boston: Harvard Business School Press.
- Lavie, D., Stettner, U., & Tushman, M.L. (2010). Exploration and exploitation within and across organizations. *Academy of Management Annals*, 4, 109–155.
- March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.
- McFadyen, M.A. & Cannella, A.A. (2005). Knowledge creation and the location of university research scientists' interpersonal exchange relations: Within and beyond the university. *Strategic Organization*, 3(2), 131–155.
- Nahapiet, J. & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242–266.

- O'Reilly, C. & Tushman, M. (2013). Organizational ambidexterity: Past, present and future. *Academy of Management Perspectives*, 27(4), 324–338.
- Park, H.W. & Leydesdorff, L. (2010). Longitudinal trends in networks of university–industry–government relations in South Korea: The role of programmatic incentives. *Research Policy*, 39(5), 640–649.
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., Krabel, S., Kitson, M., Llerena, P., Lissoni, F., Salter, A., & Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy*, 42(2), 423–442.
- Perry-Smith, J.E. & Shalley, C.E. (2003). The social side of creativity: A static and dynamic social network perspective. *Academy of Management Review*, 28(1), 89–106.
- Podolny, Joel M. (2001). Networks as the pipes and prisms of the market. *American Journal of Sociology*, 107(1), 33–60.
- Reischauer, G. (2014). Wissen, Institutionen und soziale Netzwerke als Einflussfaktoren auf die Hochschulstrategie: Ein soziologischer Analyseansatz. In: E. Scherm (Ed.), *Management unternehmerischer Universitäten: Realität, Vision oder Utopie?* München: Rainer Hampp, 63–82.
- Reischauer, G. (2015). Informale soziale Netzwerke: Ein etwas anderer Weg zur Generierung von neuem Wissen. *Austrian Management Review*, 5, 51–59.
- Rodan, S. & Galunic, C. (2004). More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, 25(6), 541–562.
- Rogan, M. & Mors, M.L. (2014). A network perspective on individual-level ambidexterity in organizations. *Organization Science*, 25(6), 1860–1877.
- Rothaermel, F.T., Agung, S.D., & Jiang, L. (2007). University entrepreneurship: A taxonomy of the literature. *Industrial and Corporate Change*, 16(4), 691–791.
- Välilmaa, J. & Hoffman, D. (2008). Knowledge society discourse and higher education. *Higher Education*, 56(3), 265–285.
- von Hippel, E. (2005). *Democratizing innovation*. Cambridge: MIT Press.
- Wasserman, S. & Faust, K. (1997). *Social network analysis: Methods and applications* (Reprint). Cambridge: Cambridge University Press.
- Weick, K.E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, 21(1), 1–19.
- Zheng, W. (2010). A social capital perspective of innovation from individuals to nations: Where is empirical literature directing us? *International Journal of Management Reviews*, 12(2), 151–183.
- Zimmermann, A., Raisch, S., & Birkinshaw, J. (2015). How is ambidexterity initiated? The emergent charter definition process. *Organization Science*, 26(4), 1119–1139.