

Malin Lindberg
Luleå University of
Technology
malin.lindberg@ltu.se

Abstract

This article examines whether hitherto marginalized actors, industries and innovations – such as women, services industries and service innovations – could be acknowledged by the use of a bottom-up approach in innovation research in a way that helps make public innovation support more inclusive. It is scrutinized whether the relation between context, organization and outcomes in publically financed innovation networks such as clusters and innovation systems serves to highlight how more inclusive innovation support could be designed. Four regional innovation networks promoting women's entrepreneurship and innovation in Sweden are analyzed by a bottom-up approach, since while emphasizing decentralization and inclusion in theory, most innovation theories and policies are in practice characterized by a top-down approach, ascribing superiority to certain actors, industries and innovations while marginalizing others in a distinct – often gendered – pattern. The bottom-up approach makes it possible to expose that being a marginalized actor in public innovation support is related to the organization of entrepreneurial types of innovation systems, based on contacts established ad hoc and resources gathered from scratch, making a wider range of actors, industries and innovations relevant than in institutional types of innovation systems favored in prevalent public innovation support. By acknowledging both types of innovation systems, more inclusive innovation policies could be designed and more nuanced innovation theories could be developed.

Introduction

Keywords: innovation policy,
innovation network, bottom-
up, top-down, gender

In recent decades, researchers and policy makers have paid growing attention to innovation in terms of the development of new goods, services, methods etc. that are implemented in society and its assumed significance for continued economic growth and sustained welfare levels (Danilda & Granat Thorslund, 2011). Specifically, the role of innovation networks has been highlighted as enhancers of the development of new services and goods. This has spurred the development of national and regional innovation policies promoting innovation systems, clusters and triple helix constellations, which are three types of innovation networks believed to enhance innovation (Lavén, 2008; Leydesdorff & Etzkowitz, 1996; Nuur, 2005). There is a paradox, however, in present innovation policies in that while emphasizing decentralization and inclusion in their rhetoric, they are still characterized by a top-down approach in practice by ascribing superiority to certain actors, industries and innovations while marginalizing others in a distinct gendered pattern, before empirically proving their actual importance (cf. Lindberg, 2012; Lindberg & Schiffbänker, 2013).

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***Malin Lindberg** is associate professor in gender and technology at Luleå University of Technology, Sweden. She conducts research on social innovation, gender patterns in innovation policies and processes, gender-sensitive business counselling and women's entrepreneurship and innovation. With starting point in political science, she uses theories of bottom up and top down as political-administrative instruments, doing gender in policy and research, and classification/organization of different types of innovation networks, such as innovation systems, clusters and triple helix constellations. She specializes in participatory research, where new knowledge is developed jointly between academia and society.

A more inclusive approach is part of the ambitions stated in EU's new innovation policy strategy *Innovation Union (Europe 2020 Flagship Initiative Innovation Union, 2010: 7-8)*:

Pursuing a broad concept of innovation, both research-driven innovation and innovation in business models, design, branding and services that add value for users and where Europe has unique talents. The creativity and diversity of our people and the strength of European creative industries, offer huge potential for new growth and jobs through innovation, especially for SMEs.

Involving all actors and all regions in the innovation cycle: not only major companies but also SMEs in all sectors, including the public sector, the social economy and citizens themselves (social innovation); not only a few high-tech industries, but all regions in Europe and every Member State, each focusing on its own strengths ("smart specialisation") with Europe, Member States and regions acting in partnership.

This ambition and the underlying paradox motivate the application of analytical approaches and empirical data that are more considerate towards the possibility that a multitude of actors, industries and aspects might be active/relevant in innovation network activities, in order to fully understand how the development of new goods and services by networks can be spurred by public measures. The scientific field of policy analysis provides tools for bottom-up analyses (focusing local actors – individuals, networks or organizations – on grass-root level, not representing public authorities) that are suitable for such an endeavor, such as non-hierarchical implementation analysis. This is while they enable a broad spectrum of actors to prove their importance empirically instead of being excluded on beforehand due to biased preconceptions (cf. Carlsson, 1996, 2000a, 2000b).

This article examines whether hitherto marginalized actors, industries and innovations – such as women, services industries and service innovations – could be acknowledged by the use of a bottom-up approach in a way that helps make public innovation support more inclusive. Examining a new type of empirical data deriving from an R&D project conducted in Sweden 2005-2008 it is scrutinized whether the relation between context, organization and outcomes in innovation networks can serve to determine the importance of a broader spectrum of actors, industries and innovations than those acknowledged in most contemporary innovation policies and theories. *Context* is defined as the studied actors' (i.e. individuals, networks or organizations) relation to established innovation networks. *Organization* is defined as what type of innovation network the studied actors have constructed. *Outcome* is defined as what types of innovations that are engendered by the studied actors. The analysis engenders conclusions

that spur further development of prevalent innovation research and recommendations for more inclusive innovation policies.

Theory and policy on innovation networks

Innovation networks involving actors from different sectors of society are in society and research believed to contribute to the development of new, relevant knowledge that is transformed into new goods and services, thereby contributing to societal development and/or economic growth (Danilda & Granat Thorslund, 2011). ‘Innovation systems’ refer to innovation networks where actors from different societal spheres join forces to develop new knowledge and innovations. ‘Clusters’ refer to geographical assemblages of companies active within the same business area, exchanging knowledge, information and personnel. ‘Triple helix’ refers to innovation networks where public, private and academic actors jointly promote knowledge development and innovation (Lavén, 2008; Leydesdorff & Etzkowitz, 1996; Nuur, 2005).

National and regional authorities in Sweden and in several other Western countries have allocated a considerable amount of public funding to initiation and development of innovation networks. There is also a growing body of scientific studies on the role and effects of innovation networks (Danilda & Granat Thorslund, 2011). Critiques have been articulated towards the public promotion and scientific studies of innovation networks in that they often ascribe superiority to certain actors, industries and innovations while marginalizing others in a distinct gendered pattern. In particular, women, services industries and service innovations (except from high-tech service innovations, such as ICT) have been disadvantaged on behalf of men dominated networks, industries (such as manufacturing/high-tech industries) and innovations (mainly technological good/service innovations) (cf. Lindberg, 2012; Lindberg & Schiffbänker, 2013). This marginalization occurs despite the fact that service industries and service innovations have been attributed a central role in the transformation of Western economies to become more dynamic and knowledge-based (Marklund *et al.*, 2004). Few policy makers and researchers have analyzed how innovation is promoted within women dominated settings or within services industries, which are employing most women in Sweden and Europe. The tendency in public promotion and scientific studies of innovation networks to ascribe superiority to certain actors, industries and innovations while marginalizing others in a distinct gendered pattern can be characterized as a top-down approach, in that it – by gazing down from a superior position – has esteemed only a limited scope as relevant to networks promoting innovation on beforehand, without proper empirical investigations.

A classification has been developed by Cooke *et al.* (2004) that enables analyses of different types of innovation networks, which distinguishes between *Institutional Regional Innovation Systems (IRIS)* and *Entrepreneurial Regional Innovation Systems (ERIS)*. IRIS is based on public knowledge production and public organizations for knowledge transfer, e.g. incubators, laboratories, men-

tors and other intermediaries. IRIS is founded on engineering skills where planning is done far in advance and on a long term perspective and where the main actors are established organizations from different sectors of society. ERIS, in contrast, is characterized by the lack of established networks and resources. Individual actors – such as entrepreneurs, innovators and incubators – are there linked to each other when the need arises. The ERIS type of innovation systems is developed without long-term planning and is rather constructed from scratch in an ad-hoc manner (Ylinenpää, 2008). IRIS is characterized by a top-down approach in that it is based on interaction within already established structures, where the importance of certain actors is taken for granted. ERIS is correspondingly characterized by a bottom-up approach, in that cooperation is organized ad hoc, when needed, based on a broader scope of actors proving their importance in practice (cf. Carlsson, 2000a & 2000b).

Bottom-up approach to policy studies

This article uses a bottom-up perspective for analyzing policy from a different perspective than is usual in policy studies, inspired by the political scientist Lars Carlsson who have published numerous works that elaborate on that topic from different scientific angles (theoretical, empirical, methodological).

The term ‘policy’ has been defined as a set of ideas and the institutional arrangements initiated to realize these ideas, comprising both written policy programs and practical policy measures (Carlsson, 2000a). Sometimes, policy is regarded to be a concern only to politicians and officials, where political activity is assumed to be exercised by the government exclusively (Premfors, 1989). This perspective is coherent with a top-down approach to policy analysis. A contrasting vision has been offered, though, claiming that it is not always so that the conversion of political ideas into practice is consistent with the intentions conveyed in public policy programs. Instead, several activities might be carried out in relation to a specific policy area without being orchestrated by the government. These activities might imply other issues, decisions and practices than those promoted in the policy programs. This perspective is coherent with the bottom-up approach to policy analysis used in this article, focusing local actors on grass-root level not representing public authorities.

It is then the policy problem – not the policy program – that is regarded to be the organizing force in a specific policy area. The term ‘policy problem’ has been defined as a publicly expressed disapproval by any societal actor, followed by demands that the problem should be solved by political action (Carlsson, 2000a). The disapproval and political action does not necessarily have to be articulated or carried out by public policy institutions. Instead, it can imply interplay between several individuals and organizations, adhering to many different sectors of society. The term ‘problem’ is then “used in a broad sense, also signifying concepts like needs, challenges and strains” (Carlsson, 1996: 540). Efforts to promote women’s entrepreneurship and innovation focused in this article could thus be considered to constitute a part of innovation policy in

the sense that a policy problem has been identified by the concerned actors, requiring political action in order to be solved. The policy problem that has been identified by the concerned innovation networks studied here is the one-sided priority pattern in innovation policies, ascribing importance only to a few, centrally distinguished, actors, industries and innovation types while marginalizing others. The suggested solution is to identify a broader range of actors and industries contributing to innovation and societal/economic development. This is suggested to take place in a dialogue between several different societal actors representing the public, private, academic and the non-profit sector (cf. Lindberg, 2012).

The methodological approaches of bottom-up and top-down have been used as analytical approaches in political science research for several decades (cf. Carlsson, 1996, 2000a, 2000b; Hjern, 1982; Lipsky, 1978; Matland, 1995; Sabatier, 1986). Originally, these approaches were used to study how policies are implemented and what factors may explain the success or failure of policy implementation (Carlsson, 1996; Sabatier, 1986). As bottom-up and top-down were developed further as analytical tools and theoretical concepts, increased attention was paid to a wide range of policy activities and aspects, however, not only to the ones strictly related to governmental implementation (Matland, 1995). By applying a bottom-up approach on a relatively new area of policy actions – that is, the public promotion of innovation networks – this article maintains and expands this tradition of political science. A bottom-up approach has previously been applied in relation to innovation systems and clusters only in a few research studies (cf. Fromhold Eisebith & Eisebith, 2005; Goldfarb & Henrekson, 2003).

The main difference between the bottom-up and the top-down approach is that while the hierarchical approach emphasizes the power of the government and public authorities to determine policy activities by means of political-administrative control through policy programs, the bottom-up approach draws attention to how a wide range of actors might be influential e.g. concerning the promotion of innovation in networks (cf. Sannerstedt, 2001). The bottom-up approach does not preclude, however, that the researcher may find out that some actors play a more important role than others when the empirical study is carried out. But each actor's relevance is then proven empirically, not assumed in advance (Carlsson, 1996). A bottom-up approach might thus help to depict both those actors who have been ascribed importance in prevalent innovation policies and those actors who have been ascribed a minor role – but who nevertheless may prove to be of importance to the promotion of innovation, which is essential in this study.

The bottom-up tool of non-hierarchical implementation analysis provides techniques for mapping which actors are involved in a particular innovation network (cf. Carlsson, 1996, 2000a, 2000b). The identification is based on the participants' own perception of who is involved. In this way, bottom-up studies imply an extensive search for appropriate units of analysis, rather than take these for granted as in a top-down approach. Two basic questions guide the mapping of bottom-up innovation networks: What is the problem to be solved? and Who

participates in the solution of the problem?. The first question makes it possible to detect policy problems that may not be mentioned in policy programs, but that nevertheless are perceived as policy problems by some people. The second question enables an estimation of whether political authorities contribute to the process of problem-solving or not. Both questions are formulated as open questions in order to reduce the risk of preconceived perceptions to influence the identification of relevant problems and actors. After finding out the answers to these questions, the researcher is free to choose any suitable scientific theory in order to deepen the understanding of the policy processes being studied, which also reduces the risk of discriminatory biases in the data collection.

The non-hierarchical approach is thereby mainly an analytical starting point without all-embracing theoretical aspirations, simply being a tool for identifying and describing ongoing policy processes. According to Carlsson (1996), it is quite possible to construct theories concerning how governance and networks are used as steering methods in contemporary policies. But a coherent implementation theory is still far from being realized. Some analytical entities and their interrelation have been suggested in non-hierarchical implementation analysis, providing incentives to construct a more comprehensive theory (Carlsson, 2000a). These relations address two different aspects: the character of networks and the outcomes of networks. The character of networks here comprises two sub-aspects: context and organization. Context refers to the studied actors' relation to established innovation networks, if they are part of these or not. Organization refers to what type of innovation network the studied actors have constructed and how it has been constructed: bottom-up or top-down. The outcome of networks refers to what types of innovations that are engendered by the networks being organized. Concerning the character of networks, it has been proposed that the specific context of each network affects its organizational features. Regarding the outcomes of networks, it has been suggested that the organizational features, in turn, affect the results. Carlsson (*ibid*: 507) has described this latter relation by stating that "the creation of politics and its outcome will differ, depending on how a policy area is organized". Different types of networks will, according to the proposed interrelation, evoke different types of results. Regarding innovation networks, some of them might thus produce new knowledge and innovation in a way that differ from the others depending on their context and organization, which will be studied in this article.

Research design

The empirical data presented in this article emanates from an R&D project conducted by Luleå University of Technology and Mälardalen University, Sweden, during 2005-2008. The project was financed by the Swedish innovation agency VINNOVA and the European Regional Development Fund. In the project, prevalent innovation policies in Sweden (on regional and national level) were contrasted with the efforts to promote women's entrepreneurship and innovation by four regional innovation networks: SAGA and Emma Resource Centre situated

in northern Sweden, as well as *Företagsamma Kvinnor* (Entrepreneurial Women) and *Lika Villkor* (Equal Conditions) situated in middle Sweden. These networks had problematized the use of innovation networks as a policy tool and theoretical concept themselves, even before the project was initiated. They had noticed the pattern of gendered exclusion in prevalent innovation policy and research in Sweden, where a homogenous group of actors, industries and innovations had been prioritized in a distinct gendered pattern; marginalizing women, services industries and service innovations (cf. Pettersson, 2007; Lindberg, 2012). The networks thus serve to illustrate the tension between innovation policies formulated top-down, recognizing a limited scope of actors and industries, and activities undertaken bottom-up, acknowledging the plausible importance of a broader scope of actors and industries. The “newness” in this type of data is that it represents actors and industries that have not yet been acknowledged in prevalent innovation theories to any great extent, but who nevertheless possess a potential to contribute to theoretical development.

The data consists of the network members’ own recites of how they perceive and pursue their activities. The recites have been collected interactively, following the procedures of participatory research – also known as action research – where new knowledge is developed jointly by researchers and stakeholders (cf. Aagaard Nielsen & Svensson, 2006). The interactive collection of data took part at dialogue seminars, arranged as a part of the R&D project (cf. Shotter & Gustavsen, 1999). Two seminars were carried out with each network, in total six seminars lasting three hours each, with 10-15 participants (representing both entrepreneurs and promoters of innovation/entrepreneurship) from each network at each seminar. Four researchers participated at each seminar (the author included). At the seminars, the participants were encouraged to describe their activities and reflect upon them in the light of predominant innovation policies and theories (i.e. regional, national and international policy programs on innovation and growth in Sweden and EU). Two of us researchers moderated the discussions, encouraging the participants to express themselves verbally and in drawing. They were also invited to contribute to brainstorming sessions where their statements were written down on a white board. Consensus was not encouraged in the recites in order to grasp the multifaceted views expressed by the network participants. All discussions were recorded and transcribed by us researchers. The result of the brainstorming sessions was photographed and the drawings were collected. The empirical data to this article is thus constituted by transcriptions, photos and drawings. In addition, existing reports and websites of the networks have informed the study.

In order to structure and analyze the data, a specific bottom-up policy analysis tool has been used – non-hierarchical implementation analysis – making it possible to portray a particular policy area, such as innovation policy, from the stakeholders’ point of view. The tool of non-hierarchical implementation analysis has guided 1) the identification of actors and industries that are depicted as important in the recites of the network members, 2) the identification of what problems the network members perceive as important to solve, and 3) the identi-

fication of what actors are involved in solving the perceived problem (cf. Carlsson, 1996; Sannerstedt, 2001). The resulting map of actors, industries and problems depicts a political landscape of innovation networks defined bottom-up, where aspects central to the networks and their members – such as visions, activities, strategies, industries, innovations, interactions, influence – are highlighted. Comparing this map to top-down perceptions of innovation networks, conclusions are engendered that spur further development of prevalent innovation theories and policies.

Findings

This section presents an empirical map of the actors, industries and problems focused by the four innovation networks studied in this article. The four networks, all promoting women's entrepreneurship and innovation, are:

SAGA (acronym for *Sámi Network Connectivity Gender Allocation*) was formed as a network in the beginning of the 21st century in order to ensure women's involvement in and benefit from the development of a new system for Internet access in remote areas. The network members were entrepreneurs, civil servants, non-profit representatives and researchers. They thus constituted a cross-sectoral group, but partially relied on coordination and funding from the public sector. *Emma Resource Centre* (hereinafter called *Emma RC*) was established in 1992 as a non-profit organization for rural women in northern Sweden, assisting women's realization of their ideas of new ventures, innovations, projects and activities in rural areas. They partially relied on public funding when managing specific projects, aside from their non-profit work efforts. *Entrepreneurial Women* is a non-profit organization situated in the middle parts of Sweden, promoting women's entrepreneurship through mutual inspiration, run by women business owners themselves. They partially rely on public funding when managing specific projects, aside from their non-profit work efforts. *Equal Conditions* was during the period 2003-2007 a national pilot project managed by regional public authorities in the middle parts of Sweden, aiming to develop methods to highlight and realize women's entrepreneurial and innovative ideas. They were thus managed and funded by public authorities but involved several women entrepreneurs and volunteers in their activities.

The four networks shared the *vision* of gender equal local and regional development, united by their focus on women's entrepreneurship and innovation. This vision was motivated by the network members' perception that women's contribution to economic and social development had been ignored by policymakers and scientists and that the conditions for realizing business ideas and innovations were unequal for women and men (which has been confirmed by numerous research studies in Sweden, e.g. Andersson *et al.*, 2012; Danilda & Granat Thorslund, 2011; Lindberg, 2012; Pettersson, 2007). The network members had experienced that men as entrepreneurs/innovators and industries employing mostly men were prioritized in regional and national policy programs and research studies for growth and innovation while neglecting women as en-

trepreneurs/innovators and services industries employing most women. One of SAGA's network members stated at one of the dialogue seminars that:

The structures are not gender equal. The knowledge about our types of ideas and industries is low among public officials who are supposed to make qualified decisions about public funding to innovation and entrepreneurship. They make their problems our problems because they do not understand what we want to do. (Dialogue seminar, 30 March, 2006)

The *activities* of the four innovation networks encompassed organization of sub-networks, clusters and innovation systems among women entrepreneurs and innovators, primarily within services and creative industries. The network members also participated in public seminars concerning the development and implementation of local, regional and national development policies. Thereto, they provided their target group – women wanting to realize their ideas of new businesses, innovations, projects etc – with business counseling, seminars and study visits. The networks also developed and used methods and models for analyzing and promoting entrepreneurship and innovation in private and public services, culture, tourism and ICT. The main organizational form of these activities has been short-term projects, which several of the network members claimed to obstruct the realization of their long-term ambitions. These projects have mostly been financed by relatively small amounts from public gender equality funds, since the networks were denied access to more extensive public funding from general funds targeting entrepreneurship, innovation and regional development (cf. Lindberg, 2012; Lindberg *et al.*, 2012; Lindberg *et al.*, 2014). One of Equal Conditions' network members describes their activities like this:

We work to get involved in the formulation of the regional policy programs for societal development and economic growth. Everything we do is intended to affect structures, ranging from influencing attitudes towards women's ideas to knowledge sharing about women's entrepreneurship and innovation. We are ambassadors for the issue of gender equality in various contexts. At another level we are organizing networks so that women entrepreneurs get to meet each other in order to form larger groups and feel more connected to other entrepreneurs. Highlighting good examples and role models, so others can imagine themselves in the same position. (Dialogue seminar, April 4, 2006)

One of the main *strategies* used by the four networks was to initiate cooperation between women as entrepreneurs/innovators and to inspire cross-industrial/sectoral cooperation. By gathering individual women in greater agglomerations, the networks hoped to increase both the number of women realizing their ideas and their visibility and impact on regional and national development policies. These agglomerations were labeled as networks, clusters or inno-

vation systems. The network participants were well aware of that their efforts to link women's entrepreneurship and innovation to clusters and innovation systems contrasted with the masculine norms in prevailing innovation policies and research, which motivated them to participate in the development and implementation of regional and national policy programs for economic and societal development. One of SAGAs network members reflects on the matter like this:

I thought about the possibility of labeling ourselves as innovation systems. Is it something that is done top-down [points to the headlines of policy and universities written at the whiteboard], designating something as an innovation system? We are probably organizing innovation systems when we initiate associations and networks. But we seldom call it innovation systems. Is it a matter of who the interpreter is? (Dialogue seminar, October 19, 2006)

The *industries* focused by the four networks primarily comprised services and creative industries, such as tourism, culture, events, health care, childcare, gender equality and ICT. There were only isolated examples of activities targeting other industries, such as the food processing and manufacturing industries. Since the services and creative industries employ most women, except from ICT that is a men-dominated industry, the networks prioritized the industries that are most important to women's employment, entrepreneurship and innovation. One of the entrepreneurs involved in Entrepreneurial Women describes her business like this:

I work with flowers. I started to dry flower arrangements and thereafter it evolved to include fresh flowers, intended for castles and country estates. For five years, I have arranged weddings, primarily in cooperation with a castle. (Dialogue seminar, June 1, 2006)

In terms of *innovations*, a wide range of new goods, services and methods can be distinguished in connection to the networks' activities. An entirely new infrastructure for Internet connectivity in sparsely populated areas was for example developed by some members in one of the networks. Pioneering methods for mapping and supporting innovation systems and clusters in services and creative industries were developed in three of the networks. Wedding arrangements based on local cultural historical traditions is another innovation discerned in the empirical data. Digitalized home-help service to peripheral villages was also developed, alongside Internet sales of Sámi handicraft. Methods supporting the realizations of women's business ideas were developed as well as a system for micro-credits to women in ethnic minorities. These innovations all have clear links to the specific industries focused by the networks; service and creative industries as well as ICT. One of the entrepreneurs involved in Entrepreneurial Women describes the emergence of her innovation of cultural wedding arrangements in an old mine like this:

I had lived in the neighborhood for six years and I had not heard anyone talk about the mine. Then I visited the mine myself and I was very surprised that not one single person in the neighborhood had thought about using this special place for special occasions. I asked around a bit and said: ‘This is really cool, don’t you realize that?’. The director and one of the owners of the mine liked my idea of wedding arrangements and helped me to realize it. (Dialogue seminar, September 20, 2006)

Regarding their *interaction* with other actors in society, all four networks cooperated with all four societal sectors – the public, the private, the academic and the non-profit sector – in terms of target groups, cooperation partners, financiers, project owners, idea generators etc. The extent of the contacts with the different sectors varied between the networks, though. All of the networks had extensive contacts with the public and non-profit sectors, in that these served as financiers, partners, target groups or idea generators. Emma RC had least contact with stakeholders in the private sector, while Entrepreneurial Women and Equal Conditions had least contact with the academy. The networks have also interacted extensively with international partners, in order to enforce their activities and achieve their objectives and to increase their legitimacy at home. One of Equal Conditions’ network members formulates the interaction between sectors like this:

I am working in a privatized organization for local business and economic development owned by commercial interests but which operates on behalf of the municipality that buys our services. At the same time, non-profit actors are the most important. People who are active in various organizations emerge ideas that can be transformed into commercial ventures. The working non-profits are the truly entrepreneurial ones. (Dialogue seminar, October 19, 2006)

The network members reported that external, mainly public, actors have had great *influence* on the focus and scope of their activities. This influence has been exercised for example by public authorities on local, regional and national level when granting or refusing public funding to different suggested activities. Often, the negotiations about funding have led to adaptation of the networks’ initial ideas in order to better fit the policymakers’ intentions (cf. Lindberg, 2012; Lindberg *et al.*, 2012; Lindberg *et al.*, 2014). The stated (or lack of) symbolic support from public authorities, has affected the self-esteem among the network members. Invitations from public authorities to participate in the development and implementation of regional policy programs have also affected their feeling of being considered as important contributors to societal and economic development. The relations to other business counseling service organizations – both public and civil ones – have affected the network members’ ability to realize their intentions of attaining gender equal access to business counseling. Whether

or not the other business counseling organizations have been willing to interact with the networks and tried to increase their own knowledge about gendered structures has affected the networks' ability to reach out with their services to their target groups. In some cases, the network participants perceived that they had been dismissed and ridiculed by officials and advisers who have argued that women (and others) working in services or creative industries lack knowledge, contacts and other prerequisites needed to realize an innovation or a business idea. One of the Entrepreneurial Women's network members describes how their organization has been affected both negatively and positively by public authorities on different levels:

When you once have experienced being shut down by the municipality you do not want to get involved with them again. We have never applied for funding from them again. Now when we are financed elsewhere by national public authorities they can not shut us down. It is a strength, a giant strength. (Dialogue seminar, June 1, 2006)

Analyzing marginalized innovation networks bottom-up

In this section, it will be analyzed how the analytical approach of bottom-up policy analysis highlights the context, organization and outcome of the four studied innovation networks and thus their importance for the development of new goods and services.

The study demonstrates that a non-hierarchical bottom-up approach to the study and promotion of innovation networks makes it possible to acknowledge that a group of actors and industries that up till now has remained unacknowledged in policy and research actually *are* active on the area of promoting innovation by networks. This group consists of women-led and women-oriented networks, promoting entrepreneurship and innovation within services and creative industries. In the accounts of their activities it is exposed that the networks have involved not only their own members and main target group, but also external actors, in order to attain their goals. It is thereto revealed that their activities have been adjusted to requirements articulated by these external actors. This implies that both public actors and other actors are important in innovation networks even though this variety is not reflected in prevalent innovation policies and theories.

The network members' own formulation of the policy problem is that some actors and industries have been marginalized in the public promotion and scientific studies of innovation networks due to gendered biases. It is thereto exposed that the four networks perceive a wide range of actors and industries as important to the promotion of innovation. Women are regarded to be important for the development of new goods and services in networks, especially within services and creative industries. Moreover, external actors from four different societal sectors (the public, private, academic and non-profit) have proven to be relevant to these innovative processes.

Combining theories of innovation networks with a scientific bottom-up approach makes it possible to acknowledge that the four studied networks can be scientifically classified as innovation systems. This since they have gathered actors from different sectors in order to develop new knowledge that is transformed into new goods and services, despite the reluctance of public policy and research to define them as innovation systems due to gendered biases. This is unveiled thanks to the bottom-up approach's ability to acknowledge a wide range of actors and industries as important, not only the ones mentioned in prevalent policy programs and research studies.

The studied networks have not unconditionally accepted the prevalent norms for how innovation systems are supposed to be organized, though. Rather they have challenged these norms by expanding the range of relevant actors, industries and innovations in such networks. Besides women and services industries, the networks have also involved the non-profit sector contributing with new ideas, continuity and knowledge and thus expanded the triple helix model into a quadruple helix one (cf. Carayannis & Campbell, 2009; Carayannis & Campbell, 2010; Lindberg *et al.*, 2012; Lindberg *et al.*, 2014). The networks have thereto expanded the range of innovation types, adding new services, methods and experiences to the dominating focus of policy and research on innovation as primarily concerning technological goods/services.

Relating the data to the theoretical distinction between IRIS and ERIS types of innovation systems, the four networks mainly correspond to the ERIS type since they have organized their networks ad hoc, from scratch, engaging actors perceived as important at the moment without following established institutional proceedings. The ERIS classification thus makes the four networks "visible" as innovation systems. The network members' perception that the attitudes and standards of external actors have affected their room of maneuver to execute their network activities as intended is relevant in relation to the ERIS/IRIS distinction. The experiences of being marginalized by external actors, for example by public authorities when granting or refusing funding and by various business counseling service organizations when willing or refusing to interact, expelled the four innovation networks from forming IRIS types of innovation systems. This forced them to create their own contacts and gather their own resources from scratch in ERIS types of innovation systems.

The article thus demonstrates that the use of a bottom-up approach in the research design and data analysis in combination with the ERIS and IRIS classification makes it possible to analyze the relation between context, organizational features and outcomes in innovation networks. The study exposes that the four networks have not been a part of existing IRIS types of institutional innovation systems (context), which have forced them to organize themselves ad-hoc as ERIS types of entrepreneurial innovation systems (organizational features), resulting in a broader range of innovations in terms of new services and methods (outcomes). The context of being a marginalized actor in public innovation support and innovation research thus seems to be related to the development of new

types of innovation networks, distinctly different from the traditional ones, in turn evoking a variety of new goods and services.

Implications for policy and theory

This final section discusses how the analysis of the relation between context, organization and outcomes in innovation networks can inform the design of more inclusive innovation policies and further develop existing theories on innovation networks.

The study highlights how women as entrepreneurs, innovators and organizers of innovation networks have been marginalized in a way that have forced them to form their own, new networks in order to realize their ideas. Depending on the context of the actors – if they are part of established, institutional innovation networks or if they lack such connections – the innovation networks are formed either top-down or bottom-up – that is, either with an established set of actors or from scratch – which in turn affects the results, i.e. what types of innovations that are engendered. Even if this entrepreneurial way of promoting innovation and entrepreneurship was initially *a reaction* to exclusion in innovation policies, it eventually led to increasing public legitimacy with the potential to *proactively* include a broader spectrum of actors, industries and innovations in public innovation support.

Policy implications to be drawn from the analysis comprise the need for a broader inclusion of actors, industries and innovations when mapping and promoting innovation networks in public policy programs. Actors that hitherto have been marginalized in policies – such as women-led and women-oriented networks as well as non-profit actors – ought to be acknowledged and allowed to prove their importance empirically instead of being dismissed in advance due to biased preconceptions. Marginalized industries/sectors – such as services and creative industries as well as the non-profit sector – ought to be acknowledged in the same manner. The same goes for innovations in the form of new services, methods and organizations. Policy efforts to promote innovation could thereby increase their effectiveness in that they would not miss out certain actors and industries with potential to contribute to innovation, entrepreneurship, societal and economical development.

These conclusions also call for further development of existing theories on how the development of new goods and services can be spurred by innovation networks. This includes an acknowledgement of the relation between context, organization and outcomes, which in line with the approach used in this study can be achieved by analyzing new sets of empirical data by means of bottom-up tools for policy analysis. Future studies on innovation networks could map varieties of this relation in different geographical, cultural and social contexts and in regard to additional types of power structures such as class, ethnicity and age.

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