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The special characteristics of tourism innovation networks: The case of the Regional Innovation System in South Tyrol

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ABSTRACT

The present study investigates the relevance of inter-organizational and cross-sectoral relations for innovation activities in tourism, analyzing whether networked innovation in tourism differs from other sectors. The aim is to highlight the special characteristics of tourism in the context of a Regional Innovation System (RIS) by means of a Social Network Analysis (SNA) carried out on small and medium sized enterprises in the Autonomous Province of Bolzano-Bozen (South Tyrol) in Italy. The analysis indicates that enterprises in the hospitality and tourism industry are strongly embedded in their regional context, showing a distinct tendency to prefer collaboration across sectors for innovation. The conclusions of this study highlight that the characteristics identified with regard to tourism innovation networks, territorially embedded but highly influenced by other sectors, may provide a possible explanation for some of the traits of tourism innovation identified (e.g. a high degree of imitation in destinations).

1. Introduction

Globalization processes and increased competition have led companies to depend more and more on the development of new products and offers (Marais, du Plessis, & Saayman, 2017), on the participation in inter-organizational networks and the involvement in co-creative company-customer networks (Kandampully, Bilgihan, & Zhang, 2016). Networks can give added value to all the actors involved since they increase flexibility, facilitate access to resources and/or markets, reduce production costs, or promote inter-organizational learning (Bachinger, 2011; Jesus & Franco, 2016). Inter-organizational networks differ from social networks in general, as cooperation between enterprises requires taking into consideration organizational structures. Moreover, the coordination of networks between organizations may be more complex and multi-faceted than coordinating relationships between individuals. In particular, the participation in a network for small and medium-sized enterprises (SMEs), if well-organized, can be a strategy to access resources and save costs (Farsani, Coelho, & Costa, 2014; Innerhofer, 2012; Kofler & Marcher, 2018; Pechlaner, Herntrei, Pichler, & Volgger, 2012; Volgger, 2017).

From a general viewpoint, according to Weber and Khademian (2008, p. 334), networks can be defined "by the enduring exchange relations established between organizations, individuals, and groups." Inter-organizational networks are understood as an independent form of coordination and interaction between autonomous organizations (i.e. formally associated groups of people, either for-profit or not-for-profit) working together for a certain period of time (Weyer & Abel, 2000). In the field of innovation, inter-organizational cooperation can help to overcome cost-related difficulties in single company-driven innovations. At regional level, horizontal and vertical cooperation between enterprises may also help to activate existing endogenous potentials owing to the supportive regional milieu and geographical proximity (Gunday, Ulusoy, Kilic, & Alpkan, 2011). In fact, typically, the actors involved are embedded in a regional context and do not innovate in isolation, but as part of a larger system that generates and disseminates knowledge and could be called a Regional Innovation System (RIS) (Cooke, Gomez Uranga, & Etxebarria, 1997; Doloreux & Parto, 2005). This sort of territorial embeddedness and proximity within regional networks can provide an important basis to build trust and transfer implicit knowledge (Parra-López & Calero-García, 2009; Woolthuis, Hillebrand, & Nooteboom, 2002). Therefore, scrutinizing network characteristics becomes central to understand the dynamics and complexity of inter-organizational cooperation with regard to the area of innovation at regional level.

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However, particularly in areas specialized in business-to-consumer (B2C) relationships, which characterize almost the entire service sector, it is difficult to measure innovation activities, since service-oriented enterprises usually do not possess technical components or do not normally register patents. The EU's Regional Innovation Scoreboard (European Commission, 2016) uses, for example, 12 indicators to measure the innovation activity of a region. These indicators are mainly based on data such as patents, gross domestic expenditure on R&D, the number of persons with a university degree, etc.[1] Against this background, regions are categorized in "innovation leaders," "strong innovators," "moderate innovators" and "modest innovators." It is difficult to classify in these categories of regional innovativeness regions with a dominant service sector and, in particular, with a big tourism industry. Therefore, such regions risk to be classified as less innovative, although innovation in the service sector is just as important as in other industries. It is therefore clear that it is necessary to better understand the particular characteristics of inter-organizational innovation in tourism, in order to prevent a too hasty labelling of tourism as a low-innovation sector (based on partially inappropriate data). Only a few extant studies have investigated the role of tourism within a RIS (Hall & Williams, 2008; Hjalager, 2010b; Pechlaner et al., 2012; Sundbo, Orfila-Sintes, & Sørensen, 2007; Weidenfeld, 2013; Weidenfeld & Hall, 2014) and, to the best of our knowledge, none of these RIS-oriented tourism studies focus on inter-sectoral links or on inter-sectoral comparisons by combining geographical and sectoral approaches to tourism innovation (Sundbo et al., 2007).

In addition to the specificities of the service sector, such as the ease in imitation (Sundbo et al., 2007), Volgger (2017) identifies distinguishing characteristics of the tourism industry, which consider: (1) regular guests as a factor capable of inhibiting innovation, and (2) the often small and medium-sized tourism and hospitality enterprises as capable of weakening innovation and knowledge transfer. Moreover, tourism products do not involve only single actors; product bundles at tourism destination level are of central importance. Therefore, in the case of tourism, it is accurate to speak about a genuine "network industry" (Brás, Costa, & Buhalis, 2010; Scott, Baggio, & Cooper, 2008). Although tourism is considered as a system where interdependence is essential (Scott et al., 2008), it is astonishing that combined research analyzing the interplay between tourism innovation and cross-sectoral cooperation are rare within tourism (Hjalager, 2010a; Innerhofer, 2012; Pechlaner et al., 2012). Taking into account such peculiarities of the tourism sector and the need for further research, this paper investigates the relevance of inter-organizational and cross-sectoral relations for innovation activities in tourism and analyzes whether networked innovation in tourism differs from other sectors. The research question is: How does tourism differ from other sectors in innovation activities? The purpose of this paper is to highlight the special characteristics of tourism in the context of a Regional Innovation System (RIS).

The research tackles such questions by focusing on the example of the Autonomous Province of Bolzano-South Tyrol in Italy. The region has a dominant service sector (75.0% of its GDP is generated by services, 20.3% by industry and 4.7% by agriculture; ASTAT, 2015a), mostly covered by accommodation and food service activities. Moreover, the 2016 Regional Innovation Scoreboard of the European Commission defined the region as a "moderate innovator." This study is particularly interested in single enterprises, conceived as actors within a regional network. As argued elsewhere (Presenza & Cipollina, 2010; Scott et al., 2008), the social network analysis (SNA) is an appropriate method to analyze such inter-organizational network structures. Therefore, small and medium-sized enterprises of different sectors were interviewed through written questionnaires and personal interviews, and were specifically requested to name their key partners (Jansen, 2007; Merluzzi & Burt, 2013; Wasserman & Faust, 1994).

The paper contributes to the existing literature by showing that tourism innovation networks consist of a two-sided structure, shedding some light on the alleged innovation and imitation-dynamics within tourism (Hjalager, 2002, 2010a). In the networks observed, the inventions and new ideas generated seem to be driven by ties to other sectors, whereas the relevant implementation and everyday collaboration appear to be highly specific to tourism and the location, potentially resulting in an imitating behavior at destination level.

2. Theoretical framework

2.1. Regional Innovation Systems

Innovation can be considered as "[…] the implementation of a new or significantly improved product (good or service), or a process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations." (OECD & Eurostat, 2005, p. 46; see also Gunday et al., 2011). Generally speaking, there is a sort of novelty based on the different activities of an enterprise. Innovation can be the result of a process which solves economic (or social) problems and implies changes for all the actors involved (Mendoza, 2015). As innovation activities often have a spatially clustered characteristic, literature has developed various concepts that emphasize the intrinsic link between proximity and innovation behaviors, including National or Regional Innovation Systems, innovative Milieus, regional clusters or industrial districts (Bachinger, 2011; Cooke, Uranga, & Etxebarria, 1998; Jansen, 2007; Volgger, 2017; Weyer & Abel, 2000). Innovation is usually an interactive process characterized by networking, rarely linked to isolated actors (Weyer & Abel, 2000).

Owing to the relevance of spatial and cultural proximity, the territorial dimension can easily gain a central role for innovation activities. According to Doloreux and Parto, the focus on the innovation process within a regional economy opens to new possibilities: "A set of actors produces pervasive and systemic effects that encourage firms within the region to develop specific forms of capital that are derived from social relations, norms, values, and interactions within the community in order to reinforce regional innovative capability and competitiveness." (2005, p. 135). Therefore, the concept of the Regional Innovation System offers a suitable analytical framework for analyzing inter-organizational relations at regional level, both generally and specifically for the tourism context (Pechlaner et al., 2012). Cooke, Uranga and Etxebarria define the RIS as a system "in which firms and other organizations are systematically engaged in interactive learning through an institutional milieu characterized by embeddedness" (1998, p. 1581) at regional level. This definition takes into account three significant elements: "interactive learning" as a dialogic and recursive process producing knowledge and innovation; "milieu" as a territorial context characterized by specific sets of values and norms; and "embeddedness" as a relational perspective in socio-structural and territorial terms. Krätke (2010, p.85) defines RIS as a "regionally interacting knowledge generation and exploitation system that is connected to external systems" and identifies three basic pillars within the RIS: internal innovation capacity (the capacity of the regional enterprises to be innovative), regional innovation infrastructure (public research establishments, innovation-related promotion agencies at regional level), and the regional knowledge network in which actors are involved informally or formally, channeling knowledge flows at regional

[1] The Regional Innovation Scoreboard consists of 12 out of 25 indicators analyzed in the European Innovation Scoreboard: Population having completed tertiary education; exports of medium-high/high technology-intensive manufacturing; employment in medium-high/high tech manufacturing and knowledge-intensive services; patent applications; R&D expenditure in the business sector; R&D expenditure in the public sector; SMEs with product or process innovations; innovative SMEs collaborating with others; SMEs with marketing or organizational innovations; SMEs innovating in-house; non-R&D innovation expenditure by SMEs; sales of new-to-market and new-to-firm innovations by SMEs.

level and with supra-regional actors at a national or global level.

Innovation usually emerges through the interplay of different subsystems (scientific, industrial, political, financial subsystems and intermediaries) (Mattes, Huber, & Koehrsen, 2015). RIS is thus a social system in which interactions between different actors (private and public) take place within a particular region and innovation-supporting milieu (Doloreux & Parto, 2005). According to Stuck, Broekel, and Diez (2016, p. 427), "indirect relations and structural characteristics of the complete system of relations" and the differences in the actors' embeddedness have been neglected in previous RIS studies. Therefore, a more detailed analysis of the network structures with regard to the embeddedness of various actors can still provide new insights on the functionality of a RIS (Stuck et al., 2016).

2.2. The relevance of territorial embeddedness

The embeddedness approach considers that the economic activity of an actor is embedded in a system characterized by social relations, as defined by Granovetter (1990, p. 98): "By 'embeddedness' I mean that economic actions, outcomes, and institutions are affected by actors' personal relations, and by the structure of the overall network of relations. I refer to these respectively as the relational and structural aspects of embeddedness." The embeddedness approach takes into account the position of individual actors within a context in which the economic activity is not carried out by isolated actors, but is embedded in systems of social relations. Therefore, the allegation that economic relations are context-specific means that all partners in a cooperation network are interdependent. Actors do not only benefit from network advantages (for example, access to knowledge), but are also confronted with the risk of an opportunistic behavior of individual actors (Bathelt & Glückler, 2012; Weyer & Abel, 2000; Williamson, 1981). Most relationships are not exclusively economic, but exhibit social dimensions as well, including individual, material and symbolic characteristics, reciprocity and norms. Granovetter (1973) makes a distinction between strong ties and weak ties. The former are characterized by an intense exchange, kinship or friendship, whereas the latter are often more peripheral and less redundant. New pieces of information flow through weak relationships, whereas strong relationships create trust and confidence in the context of a rather "closed" structure (Jansen, 2007).

Especially in the area of innovation, there is a paradox: On the one hand, weak relations are important for ensuring the flow of new pieces of information as they provide access to a wider circle of actors; on the other hand, trust and the reduction of opportunistic actions are decisive in the successful coordination and governance of collaborative innovation activities. Especially in the case of inter-organizational networks, close links between partners and the level of trust generated hereby are the basis for implementing innovation (Weyer & Abel, 2000). Therefore, dense networks as those facilitated by territorial and social proximity, may have a positive effect on the innovation activity of the actors involved, but the positive effects may also decrease upon reaching a threshold in network density (Ahuja, 2000; Bathelt & Glückler, 2012; Jansen, 2007).

Physical proximity can play an important role in either generating localized competitive advantages or overcoming competitive disadvantages due to peripheral locations (Breda, Costa, & Costa, 2006; Parra-López & Calero-García, 2009). Alongside geographical proximity, other proximity-dimensions are important. In fact, Boschma (2005) also emphasizes cognitive, organizational, social and institutional proximities. Thus, embeddedness is linked not only to spatial proximity, but also to social and cultural components, which may reduce the risk of an opportunistic behavior and transaction costs. Therefore, the actors' "proximity" (Brenner, Cantner, & Graf, 2013; Koschatzky, 2001) – both cultural and spatial – is seen as a stabilizing factor supporting cooperation between actors. The role of proximity as a cooperation facilitator has been widely acknowledged in tourism literature, in particular by applying notions of industrial districts and clusters (Breda et al., 2006; Hjalager, 2000; Jackson & Murphy, 2006; Nordin, 2003; Weidenfeld & Hall, 2014) and advancing them towards a notion of a territorially embedded Tourism Local Innovation System (TLIS) (Prats, Guia, & Molina, 2008).

2.3. Innovation and networks within the tourism sector

Mechanisms relating to social influence within a network can induce network members to become increasingly similar. A dense network is important for developing trust, but the actors in the network also tend to imitate and adapt to each other (Jansen, 2007). While in less service-dependent sectors innovative products may be protected by patents, in tourism and hospitality new ideas and innovations are easily and widely disseminated. It has been argued that tourism and hospitality innovations are primarily imported from other sectors (Innerhofer, 2012) and, if successful, they spread rapidly. Consequently, the tourism sector exhibits a particularly high level of imitation (Hjalager, 2002, 2010a). While dense networks might potentially protect against an excessive imitation by implementing controlling measures, they can also have an inhibitory effect on the availability of new pieces of information and unusual combinations (Uzzi, 1996).

An additional special characteristic of the tourism sector is its territorial attachment. In fact, territorially defined tourism destinations are a prevalent form of tourism and hospitality networks (Hjalager, 2000; Scott et al., 2008; Volgger, 2017; Volgger, Pechlaner, & Pichler, 2013). Scott et al. (2008, p. 3) define tourism as a "networked industry where loose clusters of organizations within a destination – as well as networks of cooperative and competitive organizations linking destinations – cooperate and compete in dynamic evolution." Therefore, the network approach is useful not only for analyzing innovation processes, but also tourism destinations and organizations, owing to its potential to enhance innovation and competitiveness (Romeiro & Costa, 2010). In tourism research this approach is mainly used to analyze the social and economic dimensions of relationships within a destination or the governance of destinations with the aim to study the dynamics and strategies of relationships within a "complex destination system" (Baggio, Scott, & Cooper, 2010; Farsani et al., 2014; Romeiro & Costa, 2010), as well as with regard to stakeholders (Franch, Martini, & Buffa, 2010; Presenza & Cipollina, 2010). However, it is also used to hyperlink networks of tourism organizations (Raisi, Baggio, Barratt-Pugh, & Willson, 2017) or to analyze policy networks (Pforr, 2006).

Tourism innovation networks have been described as being "loosely coupled" (Sundbo et al., 2007, p. 91). Owing to fears of imitation, tourism enterprises are conceived as being not overly keen to collaborate closely with other similar tourism enterprises for innovation purposes. In addition, literature remains ambiguous with regard to the extent according to which local or non-local innovation networks dominate in tourism (Sørensen, 2004; Williams & Shaw, 2011). Some have argued that the organizational framework and especially public sector actors play an important role in tourism innovation networks (Rodríguez, Williams, & Hall, 2014). On the basis of such ideas, the literature has started to explore the existence of specific tourism innovation systems (TIS), possibly conceived as a component within a RIS, as the spatial component is deemed particularly relevant in tourism (Hjalager, 2010b; Weidenfeld & Hall, 2014).

3. The case of an alpine region: South Tyrol

South Tyrol is an example of regional autonomy in Europe. Located in the center of the Alps, in the Northeast of Italy at the border with Austria and Switzerland (see Fig. 1), the region counts more than 520,000 inhabitants. Within the South Tyrolian economy, agriculture and tourism play an important role, although other sectors are not any less important, quantitatively speaking. Almost 93% of South Tyrolean enterprises have less than 10 employees and the economy itself has been experiencing continuous growth rates (ASTAT, 2015a). The 2016

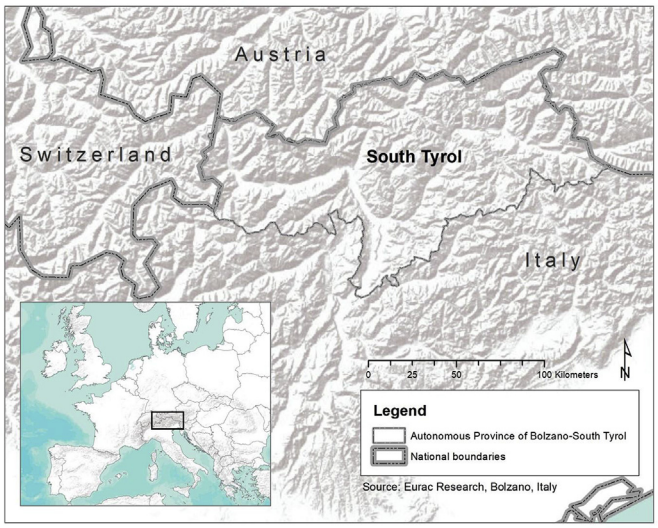

Fig. 1. Geographical location of the case study.

Regional Innovation Scoreboard defined South Tyrol as a "moderate innovator," meaning that there seems to be a need to catch up in the field of innovation. Some standard innovation indicators (in particular on the input side) show low values and affect the evaluation of the region's overall innovativeness. For instance, the region invested only 0.72% of its GDP in 2014 in research and development (ASTAT, 2015b; European Commission, 2016).

In contrast, according to EUROSTAT (2014), the region of South Tyrol ranks among the top 20 regions in Europe in terms of nights spent in hotels and other accommodation providers. In 2016, the region counted more than 30 million overnight stays (of international and inter-regional visitors), with a 7.3% increase compared to the previous year. The biggest share of visitors came from Germany (49.1%) (ASTAT, 2017). The tourism industry (accommodation and gastronomy) contributes to the regional GDP by about 13.8% (ASTAT, 2017), whereby it is considered an important business driver because of its cross-sectoral character.

Furthermore, by the end of 2015, South Tyrol had set up four publicly funded regional development and marketing agencies, each one with a different specialization in the fields of regional and tourism marketing, innovation and technology transfer, and export. In 2016, said agencies merged into a single one, bundling their competences. Consequently, the destination management and marketing of South Tyrol was repositioned in organizational terms, becoming one of the three new public management units included in a central regional agency with an overall innovation focus. This organizational development led to implications for the network character of the region: the idea of having one central management agency in the field of tourism marketing, innovation and export was aimed to bring together the different actors, forcing the closure of different sectoral networks at regional level.

All these parameters make South Tyrol an interesting case to better understand the role of the tourism industry, as well as its particularities within a RIS.

4. Methodological approach

4.1. Data collection

Social network analysis (SNA) examines the anchored network of an ego (the different alter) and its relations; it is a relational approach where the relational "multiplexity" (i.e. the frequency of communications, the type of relation, etc.) plays an important role (Jansen, 2006). Actors are connected through relations creating different types of networks which can differ with regard to "their actors, relational quality, spatial coverage and their coordination mechanisms" (Bachinger & Pechlaner, 2011, p. 4). SNA is an effective method for analyzing inter-organizational network structures, because it is based on the "assumption of the importance of relationships among interacting units" (Wasserman & Faust, 1994, p. 4). However, it also allows to analyze networks in tourism destinations (Brás et al., 2010). The aim of this study was to understand if and how the tourism sector may differ from other sectors in its innovation activity, owing to the prevalence of territorial embeddedness in tourism and hospitality and the importance of destination networks.

This study was conducted within the context of a broader series of studies carried out between March and August 2016 on the Regional Innovation System of South Tyrol from an entrepreneurial viewpoint. First of all, enterprises were asked to answer a questionnaire on general characteristics and to provide in-depth information on cooperation and innovation. In particular, the data collection of the ego networks was carried out through a questionnaire and a personal survey of selected small and medium-sized enterprises on the basis of a name generator approach (Bachinger, 2011; Burt, 1997; Jansen, 2006; Marin & Hampton, 2007; Merluzzi & Burt, 2013). A name generator means that each enterprise was asked to name its (business) network-partners in order to identify the "ego network" of each single actor. The name generator was divided into three different levels in order to capture the multiplexity of the relations. Participants were asked to name cooperation partners in general, as well as their cooperation partners in the context of innovation activities specifically. Participants were also asked to name personal (not business) contacts relevant for generating new ideas.

This last aspect was deemed important, as within inter-organizational networks "general ties and informal contacts are estimated to dominate in practice" and are difficult to analyze, "whereas specific connections and formal cooperation are perceived as (more) significant in innovation theories"[2] (Ortiz, 2013, p. 135). In this study's sample, most (90%) of the relations mentioned were formal contacts under some sort of contract.

The sampling of small and medium-sized enterprises was generated with the support of industry associations according to the snowball sampling principle. The twelve industry associations surveyed were each asked to name up to 10 "typical" companies on the basis of the following criteria: the size of the company (from 3 to 250 employees) and the location in either rural or urban areas. The sample consisted of n = 116 companies to be surveyed, of which 96 participated in the study (n = 96; response rate of 83%). The network data were analyzed using the softwares UCINET (Borgatti, Everett, & Johnson, 2013) and NetDraw (Borgatti, 2002). The achievement of acceptable data saturation was ensured by including a diversity of economic sectors and a variety of regional industry associations into the research design and by focusing on typical businesses within each sector.

4.2. Data analysis

In our sample, 89.8% of the enterprises indicated to have some type of "formal" inter-organizational cooperation. Therefore, for the purposes of this analysis, we assumed the existence of mutual cooperation, and the matrix was symmetrized. The networks were subdivided into a general "cooperation" network and a specific network for "cooperation with the aim of innovation," following the results from the name-generator approach. The first type of relationship indicates an existing cooperation in generic terms (cooperation network), while the second one indicates a cooperation with the specific objective to innovate (cooperation for innovation network). The territorial dimension was captured by a subdivision of the sample into eight geographical and

[2] Translated from German into English by the authors.

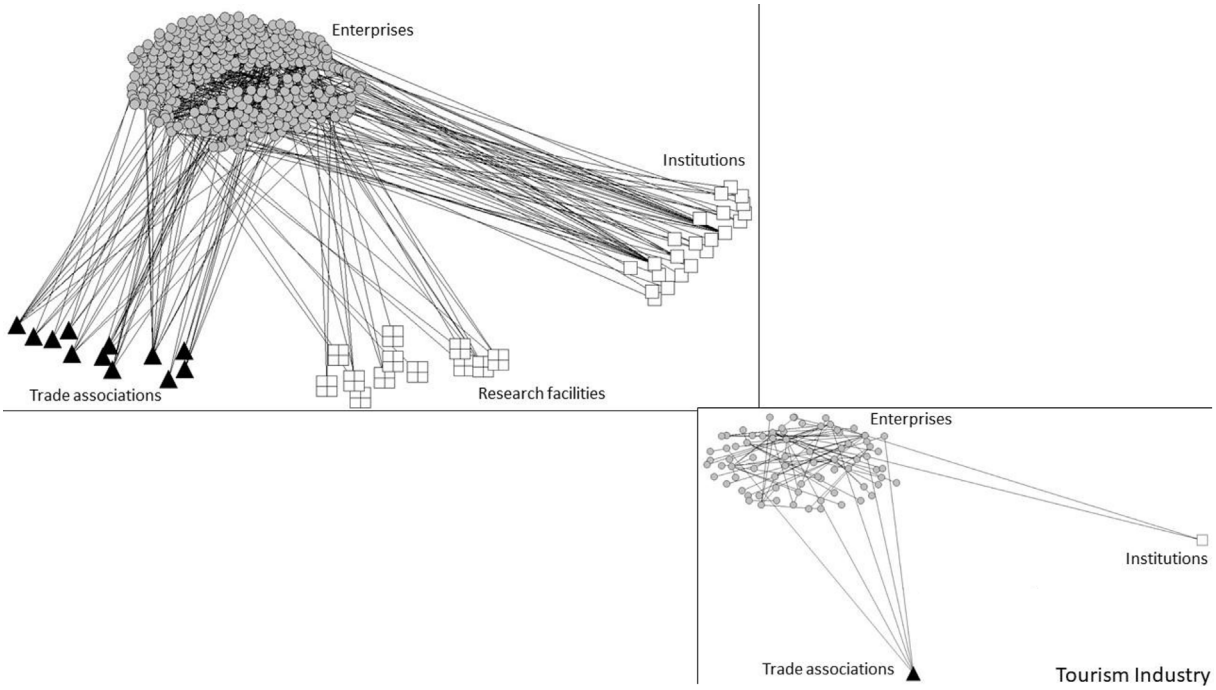

Fig. 2. Actors and network structure of the total network (Kofler & Marcher, 2018, p. 15) and the tourism sector (on the right).

administrative units, including other regions in Italy or abroad, if partners outside of the region were mentioned.

In order to capture the complexity of the object of the research and to collect a broad range of data, a mixed method approach was applied using qualitative and quantitative research methods (Creswell, 2007; Flick, 2008). The SNA enables to structure and visualize the information extracted from the interviews and questionnaires (Borgatti et al., 2013; Jansen, 2006; Wasserman & Faust, 1994). Great emphasis was placed on small and medium-sized enterprises (SME) and their interlinkages with different types of actors, paying special attention to innovation activities.

5. Findings

Fig. 2 shows the actors and network structures of all the enterprises across all the sectors surveyed comparing them with the tourism sector. With regard to the whole network sample, there are 423 nodes (actors) and 930 ties (links/relations between the actors) with an average of 2.3 ties per node (average degree). Another important network value is the overall centrality equal to 2.4%. The network structure of the tourism subsample counts 78 nodes and 150 ties and network centrality is about 5.6%. These figures indicate that the sampled tourism network is not homogeneous and not very centralized, meaning that the relations are more evenly distributed; in a centralized network (high %), only one node had many relations with others.

To understand the connections of the different types of actors within the network, the nodes were subdivided into different groups of actors: public institutions, research facilities, trade associations and enterprises. This approach highlighted that the interviewed enterprises are linked to different economic actors. A first general look at the network structure, paying particular attention to the tourism sector, highlights that the enterprises analyzed in the tourism industry mainly have inter-organizational relations with other enterprises and with private partners. Only two other types of actors were mentioned: a trade association and a public institution. There is no evidence of direct links with research facilities. Considering innovation networks, the tourism-specific network differs once again from the other sectors because of the highly preferential collaboration among enterprises. Other sectors cooperate more with institutional actors or research facilities.

Taking into consideration only the tourism sector, a clear distinction can be made between a general cooperation network and the cooperation for an innovation network. Only less than half of the nodes and ties were mentioned when cooperation was restricted to innovation as central aim. This means that, generally speaking, the tourism and hospitality enterprise sector cooperates. These cooperation activities are focused on innovation only to a minor degree.

As mentioned above, the territorial component is usually important for the tourism network. Hence, territorial embeddedness can often be found. To analyze this aspect, the networks were tested for homophily (Borgatti et al., 2013; Raisi et al., 2017). Homophily shows whether certain preferences of the nodes are consistently similar or different within a specific group, and in such case the characteristics related to the territory are of interest. Therefore, the different sectoral networks were subdivided into their territorial components (district communities) and analyzed for their openness/closure, with the help of the E-I Index (External-Internal Index). This index measures the number of ties outside of a group, minus the number of ties that are within the group, divided by the total number of ties (Borgatti et al., 2013). The Index can range from -1 (all ties within the group) to $+1$ (all ties to actors outside of the group). The closer the Index is to 1, the higher the relative share of external ties. The analysis of the total network shows an overall E-I index of 0.626 for the regional components (districts) and a value of 0.604 for the economic sectors. This means that, in both cases, connections to other groups predominate. The sample of enterprises analyzed in the tourism industry had an E-I value of 0.067 at regional level (districts) and 0.750 with regard to the group of different sectors. These values are below average with respect to external links of territorial units, and above average with respect to external links of the sectoral unit (i.e. tourism and hospitality). The values indicate that the actors of the tourism sector cooperate predominantly within their own region of origin (0.067), a behavior much more pronounced than in other sectors. However, the tourism and hospitality industry also exhibits more collaborations with other sectors than within its own one (0.750), relatively more than other sectors.

This finding is very much reinforced when considering only innovation networks. Taking into consideration the cooperation for

Table 1
E-I-Index of the innovation network by economic sector.

Sector	*Internal*	*External*	*Total*	*E-I*
industry	2	40	42	*0,905*
commerce	8	34	42	*0,619*
handcrafts	2	17	19	*0,789*
tourism	0	27	27	*1*
services	8	68	76	*0,789*
agriculture	2	34	36	*0,889*
other	18	60	78	*0,538*

innovation in the tourism network, it is interesting to note that the analyzed sample of the tourism industry is not at all cooperating with actors of its own sectors, preferring overwhelmingly to cooperate with actors from other sectors. This finding indicates that the tourism and hospitality enterprises sampled get their innovation input mainly from actors outside of the tourism sector, and carry out their innovation process in a cross-sectoral collaboration (Table 1).

The strength of ties (Granovetter, 1973) between collaborating actors can be measured through the intensity of the interaction (frequency of contact, emotional attachment, trust and reciprocity) (Jansen, 2006). To measure the strength of the relational data collected, an index was created based on the combination of the following ordinal scaled variables: level of trust toward the partner, type of relationship and contact frequency. The index is based on the classification of Frey, Lohmeier, Lee, and Tollefson (2006) offering an instrument for assessing the intensity of the interaction based on stage models of collaboration, and distinguishing five levels of collaboration: networking, cooperation, coordination, coalition, collaboration. These stages defined the degree of collaboration according to the following categories (Frey et al., 2006, p. 387):

(1) Networking: “Aware of organization; loosely defined roles; little communication; All decisions are made independently“;
(2) Cooperation: “Provide information to each other; somewhat defined roles; Formal communication; All decisions are made independently”;
(3) Coordination: “Share information and resources; Defined roles; Frequent communication; some shared decision making”;
(4) Coalition: “Share ideas; Share resources; Frequent and prioritized communication; some shared decision making”;
(5) Collaboration: “Members belong to one system; frequent communication is characterized by mutual trust; Consensus is reached on all decisions”.

Two of Frey's collaboration levels (Networking and Cooperation) were grouped into a single category “cooperation,” due to their similarity within the study sample (see Fig. 3). The first type corresponds to weak ties (Cooperation), the second and third type are a hybrid of weak and strong ties (Coordination and Coalition), while strong ties characterize the highest level of interaction (Collaboration) (Kofler & Marcher, 2018; Kofler, Marcher, Anesi, Pechlaner, & Streifeneder, 2018). Between the previously distinguished network types – cooperation network and cooperation for innovation network – no significant differences were identified. Most relationships are the result of a combination between weak and strong ties.

6. Conclusions

This paper investigated the special characteristics of entrepreneurial tourism innovation networks in a Regional Innovation System (RIS) by focusing on the case of South Tyrol in Italy. The obtained results which indicate a low E-I Index at territorial level tend to confirm the particularly pronounced territorial attachment of the tourism sector (cf. 2.3): Findings support the assumption that territorial attachment can be a distinctive trait of tourism innovation networks. However, this finding will need to be compared with other case studies in order to confirm distinguishing features in a tourism innovation system. The comparatively high share of collaborative ties placed *within* the context of territorially close actors (compared to external connections) can be read as an indication that tourism enterprises prefer to collaborate within their immediate geographical and hence are embedded in territory and destination. At a destination level, there may be positive effects of cohesiveness; nevertheless, this cohesion can also result in over-embeddedness and lock-in, as self-contained networks risk to hamper innovation (cf. 2.2). According to Ahuja (2000), network closure and embeddedness can facilitate innovation success through governance advantages and an easier mutual adaption, but the positive effect of embeddedness decreases after reaching a certain closing threshold.

A second striking characteristic of the analyzed tourism innovation networks is their high share in (regional) cross-sectoral ties. The results regarding cross-sectoral collaboration demonstrate that all sectors have a strong tendency to cooperate, and not only within their own sector. However, no other sectors reached such high values in cross-sectoral collaboration as the tourism innovation networks.

According to Granovetter (1973), “weak ties” are important for accessing new pieces of information and resources, whereas “strong ties” are more time-consuming and require a higher investment (cf. 2.2). However, the greatest benefit of strong ties consists of the high levels of trust generated. In inter-organizational cooperation between enterprises, especially in the field of innovation, a high level of trust facilitates the finding of a common interest. In such case, territorial proximity could help, because of simplified interactions. Given the indication of cohesiveness found in this study, tourism innovation networks may be well-positioned to create a solid basis of trust; moreover, their extensive share in cross-sectoral ties may help to increase the diversity of notions circulated. Tourism and hospitality enterprises seem to generate new ideas from cross-sectoral ties, as the fear for imitation within tourism networks might be too high to promote the circulation of ideas (Sundbo et al., 2007); they also seem to implement these ideas in highly trusted, territorially anchored tourism networks. In other words: Invention in tourism and hospitality seems to be driven by other sectors, whereas the implementation appears to be specific to tourism and the location. We might assume that this specific combination in a strong tourism sector between specific regional embeddedness and multiple (regional) cross-sectoral ties is linked to the often-stated perception that tourism is a sector with limited (original) innovativeness, but with a quick imitation of innovations (Camisón & Monfort-Mir, 2012; Hjalager, 2002, 2010a; Innerhofer, 2012). However, we might also assume that by combining strong local ties with weaker ties into other sectors, the tourism industry can remain up to date with new developments.

This paper contributes to the theory by highlighting peculiarities of entrepreneurial tourism networks in the Regional Innovation System (RIS). Potential structural justifications were found for the repeatedly stated observation that tourism innovativeness is limited. However, the study also indicated that tourism networks might be particularly well-suited for a quick and locally or regionally coordinated adoption of innovations. Indeed, this paper contributes to filling the gap between generic inter-organizational research and tourism research in the field of innovation. A cross-sectorial comparison helps to better understand unique strengths and weaknesses of tourism innovation networks in a subtly differentiated manner. Moreover, this paper contributes to tourism practitioners by indicating that tourism innovation networks might find strength in regional cohesiveness and inter-sectoral links and might be particularly suited for innovation implementation. However, in order to achieve a higher level of inventiveness, tourism enterprise networks might consider the possibility to increase the degree of non-regional links with tourism actors outside of the regional context (complementing their outreach to other sectors).

The tourism industry in the studied destination consists of a high

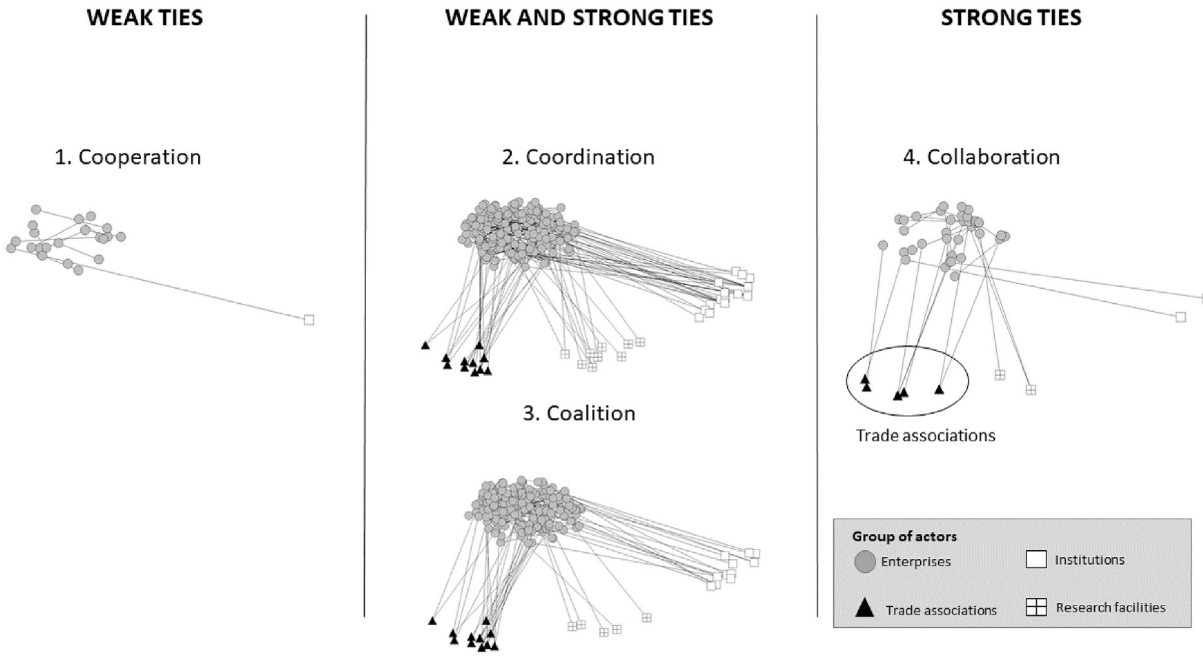

Fig. 3. Degree of collaboration (total network) (Kofler, Marcher, Anesi, Pechlaner, & Streifeneder, 2018, p. 94).

degree of small, independent (family) businesses often owned by locals and is characterized by a relatively distinct entrepreneurial continuity, which in some instances has a multiple decades long history. Hence, the generalizability of this study's findings may be higher with respect to tourism destination which are similarly characterized by a network of well-established, local micro enterprises. In relation to tourism destinations dominated by external (international) actors or destinations which are less progressed in the development cycle, it is important to highlight that some findings (such as regional embeddedness of tourism networks) of this study may be context-specific. While the study's findings resonate well with the existing literature, it is nevertheless important to consider that the particular region taken into consideration has high levels of regional network closure for historical reasons. Therefore, it will be of high value to cross-validate these findings with other regions and destinations with higher sample sizes, and/or to repeat the study in the context of a genuinely comparative research design in order to generalize some of the findings, such as for example the significance of territorial embeddedness in tourism innovation systems and the importance of cross-sectoral collaboration in innovation activities.

Conflict of interest

None.

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