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SOCIAL CAPITAL DIMENSIONS, INNOVATION, AND TECHNOLOGY IN EUROPE: A CASE-STUDIES META-SYNTHESIS

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Abstract: This article aims to improve the understanding on how structural, relational, and cognitive dimensions of social capital influence innovation outcomes on interorganizational and intraorganizational networks. A meta-synthesis research design with eight selected qualitative case studies located in a European context were conducted. The patterns of causal relationships among the variables presented in the case studies were identified. The antecedents of social capital dimensions, the influence of the dimensions on reducing barrier or impediments for innovation and on the enhancement of enablers or facilitators of innovation outcomes, and the direct effects of social capital dimensions on innovation compose the resulting framework. Furthermore, differences between the influence of social capital dimensions on innovation and technology in interorganizational and intraorganizational setting in European companies were found. The meta-synthesis this research relies on another researcher's insights and interpretation of data, being susceptible to their bias. Adopting qualitative case studies insights for getting to an analytical generalization reduces the deepness, richness, and contextual dependence of original authors' findings. The findings could help organizations developing optimal conditions for the improvement of the likelihood of gathering innovation and technology and development outcomes from both interorganizational and intraorganizational networks. This article contributes for both innovation and technology development and social capital literature by proposing an integrated framework comprised of social capital antecedents and the role of social dimensions on reducing barriers or impediments, enhancing enablers or facilitators, and affecting innovation outcomes directly.

Keywords: Social Capital Dimensions, Social Embeddedness, Innovation, Technology, Meta-Synthesis, Qualitative Case-Studies.

INTRODUCTION

Innovation and technology development is a longstanding matter of concern among organizational scholars since innovative organizations usually lead the race for competitive advantage (Sirmon, Hitt, Ireland, & Gilbert, 2011). However, despite the lack for a unanimous explanation of how, where, when they occur, and who are the responsible for innovation

and technology within and beyond organizational boundaries, a consistent stream of research has been investigating the impact of social embeddedness of individuals, organizations, and networks, on innovation performance (Powell, Koput, & Smith-Doerr, 1996; Ruef, 2002; Tsai & Ghoshal, 1998; Vasudeva, Zaheer, & Hernandez, 2013).

In this concern, beyond traditionally discussed public policies and research and development (R&D) investments (Becker & Dietz, 2004; Bozeman & Link, 2015), networks of relationships have been considered sources of knowledge, information, and resources, which, in turn, are necessary conditions for innovation (Ahuja, 2000; Powell, 1998; Whittington, Owen- Smith, & Powell, 2009).

Thus, social capital theorists have emerged in the field, considering that knowledge and resources embedded in networks are no longer individual; but are a network resource available to be mobilized and turned into economic gains by their members instead (Lin, 1999; Nahapiet & Ghoshal, 1998).

Based on previous traditional studies on social embeddedness (Bourdieu, 1985; Granovetter, 1985), there have been an effort for understanding which network configuration and structure would be optimal for achieving innovation and technology development, especially adopting social network analysis (SNA) methods (Powell, White, Koput, & Owen - Smith, 2005; Yan & Guan, 2018).

Later, scholars were concerned with the benefits and drawbacks of engaging in relationships that go beyond formal and contractual linkages, considering stronger ties, such as friendship and kinship, in innovation outcomes in interorganizational and intraorganizational settings (Adler & Kwon, 2002; Kilduff & Brass, 2010). These different perspectives on social capital are consolidated in the literature as structural and relational embeddedness (Granovetter, 1992; Moran, 2005). Additionally, Nahapiet and Ghoshal (1998) proposed another dimension of embeddedness considering the shared representations and interpretations among network members, the cognitive dimension.

Furthermore, it is noticeable that previous literature traditionally investigates such relationship and causal effects by means of quantitative studies (e.g. Landry, Amara, & Lamari, 2002; Mouw, 2006; Tsai & Ghoshal, 1998). However, an analytical generalization originated from a meta-synthesis of qualitative data would be beneficial for the comprehension of the phenomenon of interest in the proposed context, since it relies on insights gathered from in-depth investigations.

Thus, the aim of this article is to understand how the structural, relational, and cognitive dimensions of social capital presented on Nahapiet and Ghoshal's (1998) framework influence innovation and technology development in interorganizational and intraorganizational contexts in European countries. For achieving this goal, it is performed a meta-synthesis of qualitative case studies (Hoon, 2013).

This article contributes for both innovation and technology development and social capital literature by proposing an integrated framework comprised of social capital antecedents and the role of social

dimensions on reducing barriers or impediments, enhancing enablers or facilitators, and affecting innovation outcomes directly.

In this regard, organizations may rely on these findings in order to develop optimal conditions for the improvement of the likelihood of gathering innovation and technology and development outcomes from both interorganizational and intraorganizational networks.

The structure of this article is the following. A theoretical background on social capital, its perspectives, and the framework of social capital dimensions (Nahapiet & Ghoshal, 1998) adopted in the analysis of the papers is presented. Then, previous literature regarding the influence of social capital dimensions on innovation and technology studies is analysed.

The third topic discusses the meta- synthesis research design (Hoon, 2013) and the methodological path taken in order to achieve the proposed synthesis. The fourth topic presents the results of case-level analysis of each case study article and the main findings from cross-case level synthesis. Finally, in the last section, the discussion, conclusions, limitations, and possibilities for future studies are presented.

THEORETICAL BACKGROUND

SOCIAL CAPITAL: STRUCTURAL, RELATIONAL, AND COGNITIVE EMBEDDEDNESS

The study of social relations is the ground for sociological studies since its beginning through Durkheimian and Marxist approaches to social theory (Breiger, 2004; Portes, 1998). However, it was only after Granovetter's seminal works regarding social embeddedness that the structure of social relations gained much more attention. The author's theory of the strength of the weak ties (Granovetter, 1973), along with his proposition of the influence of social embeddedness over economic action (Granovetter, 1985) are considered the foundation of the current social networks theory, being, however, fundamental for the development of the social capital perspective (Moran, 2005).

Contemporary to Granovetter's contribution to social network theory is Pierre Bourdieu's work that coined the term "social capital" as we know nowadays (Bourdieu, 1985). For him, the economic capital, which is directly convertible into monetary gains, is not the only form of capital (i.e., accumulated labour).

He asserts that there are two alternative means to access economic benefits: cultural and social capital. Contrary to naturalist explanations given by humanistic traditions, the cultural capital refers to the knowledge (education) and cultural background that may lead a person or a class to succeed in detriment of others (Bourdieu, 1985).

On the other hand, the Bourdieusian conception of social capital considers it as the actual or potential accumulated resources that are accessed through membership in a durable or institutionalized social group, that is, stable network of connections, considering it as a collective-

owned capital (Bourdieu, 1985). It is noteworthy that resources are collectively- owned, but the rewards of accessing and mobilizing the social capital are for an individual unity (Coleman, 1988; Lin, 1999).

Another dominant perspective that have emerged in the studies of social capital was the communitarian perspective, funded by Robert Putnam (2000). It is distinguishable of previous approaches for considering social capital as a collective aggregate of resources, norms, and reciprocity, which, embedded in dense networks, forms a sense of civic virtue in the direction of economic development (Engbers, Rubin, & Aubuchon, 2017; Fukuyama, 2001; Putnam, 2000).

A commonality between these approaches is the acknowledgement that social capital may be either internal or external, independent of the level of analysis (individual, a small group, or even entire nations), also called bridging and bonding social capital (Putnam, 2000).

While bonding social capital lies on strong ties among individuals embedded in dense forms of networks, weak ties in sparse and loosed networks are the source of bridging social capital.

Regarding bonding and bridging kinds of social capital, the search for an ideal type of network structure is a long-standing matter of discussion in organizational studies. Two opposite main streams of research emerged from this duality.

The first argues that closed and dense networks where individuals have strong ties are more likely to develop higher levels of trust, sharing more knowledge and increasing organizational performance (Coleman, 1988; Krackhardt, 1992). The second argues that sparse networks where structural holes are present are more likely to guarantee access to non-redundant information and knowledge, increasing organizational performance (Burt, 1992; Granovetter, 1973). However, it is relevant to the argument that the most effective configuration of network structure is context- dependent. Rowley, Behrens, and Krackhardt (2000) found that the former is desirable in mature and stable industries, where the exploitation of knowledge is determinant of organizational performance, while the latter is appropriate in dynamic and knowledge-intensive contexts, in which the exploration of knowledge leads to better performance.

In organizational studies, two major streams of interest on social capital developed recently. The first is concerned to the development of social capital on the intraorganizational level (Ahearne, Lam, & Kraus, 2014; Tsai, 2000; Tsai & Ghoshal, 1998), that is, within organizational boundaries. In this regard, social capital was found to be relevant in explaining strategic alignment (Karahanna & Preston, 2013), investors' assessments of CEOs changes (Tian, Haleblian, & Rajagopalan, 2011), and improvement of employees performance (Ben-Hador, 2016; Shah, Levin, & Cross, 2018).

The second main area is concerning the development of interorganizational social capital (Inkpen & Tsang, 2005; Sorenson & Rogan, 2014), that is, outside organizational boundaries.

Recent findings account for social capital the improvement in organizational and alliance performance (Gulati, Lavie, & Madhavan, 2011; Malik, 2012), knowledge transfer and innovation (Davis, 2016; Filieri, McNally, O'Dwyer, & O'Malley, 2014; Ivancic, Podmenik, & Hafner, 2014), and internationalization (Doornich, 2018).

It is noteworthy that despite previous focus on the structural configuration of networks in terms of positional advantage, prestige, and access to resources, power and information (Adler & Kwon, 2002; Kwon & Adler, 2014; Moran, 2005), Granovetter's theory of embeddedness states that the relational aspect of social capital is as relevant as the structural one (Granovetter, 1992). Thus, scholars might take into account not only the quantity but also the quality of ties (Hosnedlova, 2017; Moran, 2005; Uzzi, 1997). Building upon this distinction between structural and relational aspects and upon the Bourdieusian perspective on social capital, Nahapiet and Ghoshal (1998) proposed an analytical framework considering the social capital as a multifaceted and multidimensional concept. For them, social capital is comprised of the overall pattern of impersonal ties in a network (structural dimension), the personal and emotional attachments of actors embedded in a network (relational dimension), and the representations and meanings that are shared by the authors in a network (cognitive dimension).

Therefore, traditional social network analysis techniques are used to measure and evaluate the structural dimension of networks. Variables such as density, centrality, cohesion, and structural holes are most commonly adopted for representing network ties, configuration, and appropriability of social capital structural dimension (Borgatti, Jones, & Everett, 1998; Nahapiet & Ghoshal, 1998).

For assessing the relational dimension, network shared trust, norms, obligations, and identification are the most common variables, as for measuring cognitive dimension, shared codes and language, and shared narratives are the variables proposed by Nahapiet and Ghoshal (1998).

SOCIAL CAPITAL DIMENSIONS AND INNOVATION: CURRENT UNDERSTANDINGS

Among several particular fields of organizational studies, innovation and technology research is interested in the social capital as an explanatory theory as well (Bozeman, 2000; Landry et al., 2002). Thus, how social capital dimensions may influence the development of innovations and technology?

The answer resides in the strict relation between knowledge, resources, and innovation outcomes (Alguezaui & Filieri, 2010; Allameh, 2018; Maurer, Bartsch, & Ebers, 2011; Tsai & Ghoshal, 1998).

First, looking into the structural dimension, previous literature considers factors such as knowledge access and sharing, information flow, resources exchanges and complementarities as drivers for innovation in interorganizational settings in both sparse and dense configurations

(Ahuja, 2000; Alguezaui & Filieri, 2010). In his influential work regarding the structural dimension of social capital influence on innovation, Ahuja (2000) found that direct ties, indirect ties, and structural holes play different roles in the acquisition of novel knowledge, resources, and diverse information in order to achieve innovation outcomes.

Another recent study found that an optimal network structure presents a cohesive core, which allows intensive knowledge sharing, but not disconnected with peripheral connections, where is located possible non- redundant knowledge (Gubbins & Dooley, 2014). This finding confirms a reconciliation between the perspectives of network cohesion and sparsity proposed by Ronald Burt (2001).

In what concerns to relational and cognitive dimensions, Hammarfjord and Roxenhall (2017) found that shared values and expectations allied to commitment are drivers of innovation in strategic innovation networks. Trust originated from strong ties is recognized as a necessary condition for relevant knowledge exchange (Levin, Walter, Appleyard, & Cross, 2016).

On the cognitive aspect, shared languages, narratives, vision, and common understandings are predictors of innovation through knowledge transfer, sharing, and creation in interorganizational networks (Nambisan & Sawhney, 2011; Tomlinson, 2012).

Regarding internal social capital, Tsai and Ghoshal (1998) show that structural, relational, and cognitive social capital are predictors of resource exchange and combination, which, in turn, leads to product innovation.

However, taking into account knowledge transfer as mediator of innovation, research (Maurer et al., 2011) has found a significant relationship only between tie strength and knowledge transfer, while trust and number of ties showed no significant relationships.

Such contradictions are indicators that the relationship between social capital and innovation still deserves further investigation. Thus, in the next section, the methodological procedures adopted in order to construct a meta-synthesis of the relationship between social capital dimensions and innovation in technological contexts are presented.

METHODOLOGICAL PROCEDURES

In order to achieve the aims of this research, it was performed a meta-synthesis method applied to management studies (Hoon, 2013). Being the meta-synthesis an "exploratory inductive research design to synthesize primary qualitative case studies for the purpose of making contributions beyond those achieved in the original studies" (Hoon, 2013, p. 523), this study intends to refine social capital theory regarding innovation and technology fields by providing an analytical generalization from in- depth and substantive contributions generated from qualitative case studies (Merriam, 2009; Yin, 2013).

As noted by Merriam (2009), this method, alike meta-analysis of quantitative studies, rely on the description and interpretation of data from third parties rather than from original data, being the only realistic way to conduct an investigation considering multiple contexts.

The meta-synthesis, in particular, is an alternative for recent calls for the connection of results of isolated case studies to produce more generalized knowledge (Best, 2015).

For ensuring rigour and reliability of the meta-synthesis, the protocol established by Hoon (2013) was conducted. According to the author's procedure, the meta-synthesis is comprised of eight steps: framing the research question; locating relevant research; defining inclusion and exclusion criteria; extracting and coding data; analysing on a case-specific level; analysing on an across-study level; building theory from meta-synthesis; and discussing.

Table 1 summarizes the detailed steps, their analytical goals, procedures, and outcomes.

Table 1
Metasynthesis research protocol

Steps in meta-synthesis	Analytical goal	Strategy/analytical procedure used	Outcome to generate a theoretical contribution
Framing the research question	Stating a clear research question regarding the relationship between the constructs social capital dimensions and innovation and technology.	A priori specification.	How are social capital dimensions (structural, relational and cognitive) related to innovation and technology in organizations?
Locating relevant research	Identifying the adequate keywords to find relevant research (case studies) that helps to answer the research question stated in the first step.	Adopting the Boolean search string "social capital" AND "innovati*" AND "technolog*" AND "case stud*" on EBSCO-Business Source Complete, SCOPUS, and Thompson-ISI Web of Knowledge electronic databases. Refined by business-related fields, peer-reviewed articles only.	The search string in the mentioned electronic databases returned a sum of 46 non-repeated case studies to be examined according to the established criteria by the researcher. Two additional case studies were included in the first stage due to their relevance for answering the research question.
Creating inclusion/exclusion criteria	Defining criteria for inclusion/exclusion that may be adherent to the proposed research question, to the adopted approach to social capital, and to the type of study demanded the meta-synthesis (case studies).	Developing an inclusion/exclusion criteria list; discussing clear exclusion criteria. Clear criteria for inclusion/exclusion may ensure reliability and validity of the methodological procedures adopted.	After extensive examination according to the criteria previously established, 11 out of 48 case studies were included in the final assessment (criteria #5). The final sample of the meta-synthesis was composed of 9 selected studies. The criteria adopted were: 1, business related field; 2, adequate social capital approach; 3, innovation/technology related; 4, qualitative case-study; 5, quality of the study regarding methodological description, empirical evidence-based affirmations, and relevant theoretical contribution.
Extracting and coding data	Careful reading of the full text of each study. Coding study characteristics as well as the proceeded insights of the primary studies according to the research question on social capital and innovation/technology.	Adapting Hoon's coding form to the research question of this study. Codes were added/excluded according to the authors' judgment after pretesting the code list.	Order, code, and categorize evidence from each of the case studies.
Analyzing on a case-specific level	Identifying a sequencing of variables that we found in each case to be the most influential in accounting for social capital dimensions relationship with innovation and technology.	Case-specific causal networks.	Identifying themes, core concepts, patterns, or relationships in each case.
Synthesis on a cross-study level	Merging the case-specific causal networks into a meta-causal network. Accumulating the sequencing of variables at a cross-study level to arrive at a general pattern among these variables.	Meta-causal network, variable ratings.	Identification of a pattern; social capital dimensions as a central variable; rating the variables to ensure validity.
Building theory from meta-synthesis	Identifying the relationship between structural, relational and cognitive dimensions of social capital and innovation/technology development.	Linking the findings back to the literature on social capital.	Identification of patterns of relations in the studies in order to build a meta-causal theory.
Discussion	Discussion of the results of the meta-synthesis study and potential limitations.	Discussing rigor, reliability, and validity.	Legitimizing the validity and reliability of the procedure and activities used.

Note. Source: Adapted from Hoon (2013: 529).

One of the critical steps of the investigation is the location of relevant research related to the research question. In this step, it is worthwhile to notice that given the critical realist approach to meta-synthesis, it was presupposed thematic and methodologic homogeneity (Point, Fendt, & Jonsen, 2017). Thus, considering that the interest was to gather research investigating social capital dimensions, a search at SCOPUS, Thompson-ISI Web of Knowledge, and EBSCO-Business Source Ultimate were conducted adopting the Boolean search string "social capital" AND "innovati*" AND "technolog*" AND "case stud*."[4] Unlike Hoon (2013), it was decided to add the "case stud*" search string because among the large extent of previous research on social capital, most of them have a quantitative nature (e.g., Hammarfjord & Roxenhall, 2017; Levin et al., 2016; Tsai & Ghoshal, 1998). The search was held on January 2018 and returned a sum of 46 non-repeated studies published from 2003 to 2017 in peer-reviewed journals. Two more studies gathered from a previous search string were added in the analysis (Camps & Marques, 2014; Ehlen, van der Klink, Roentgen, Curfs, & Boshuizen, 2014), since they were deemed as relevant to the research question.

In the next step, five inclusion and exclusion criteria were created in order to filter only studies with potential to help to answer the research question (Hoon, 2013). Table 2 describes each criterion and the rationales behind of them along with the motives of exclusion of each paper.

In this stage, if a paper did not attend one of the criteria, it would not be evaluated in the next ones. The first criterion was that the study should from a business-related field. Eight out of 48 was from other fields.

As second criteria, it was defined that the paper should present what was called "adequate social capital approach," that is, the paper should explicitly adopt the multidimensional view of social capital as proposed by Nahapiet and Ghoshal (1998). 26 of the 40 remaining papers did not attend the criterion. The third criterion defined that the papers should be related to innovation and technology field. Three out of fourteen remaining papers were excluded. As the fourth criterion, it was defined that the studies should be qualitative case studies performed in European context, being excluded illustrative case examples, quantitative studies, and mixed methods studies. In this step, two articles that were conducted in South America were not considered in the study, remaining nine case studies for the next assessment.

Table 2
Inclusion and exclusion criteria

Criteria	Rationales	Excluded papers
(1) Business-related field	This criterion was used to narrow the meta-synthesis only to the business- related field due to the strict interest in the phenomenon in organizational settings.	Aula and Harmaakorpi (2008), public policy; Exner et al. (2016), public policy; McMichael and Shipworth (2013), public policy; Nielsen (2003), public policy; Pitkänen (2016), public policy; Scheffran, Marmer, and Sow (2012), geography/climate; van der Horst (2011), geography/climate; Vico (2014), research policy.
(2) Adequate social capital approach	It was considered the understanding of social capital and its dimensions based on the framework proposed by Nahapiet and Ghoshal (1998). Thus, only studies that explicitly considered this approach to social capital dimension were included in the case study analysis.	Adina and Ramona (2013); Baba and Walsh (2010); Banerjee, Yadav, and Banerjee (2016); Barbosa, Noronha, and Castro (2012); Beckett (2008); Blomqvist, Hurmelinna, and Seppänen (2005); Bocquet and Mothe (2011); Borges and Filion (2013); Cannone, Pisoni, and Onetti (2014); Driedonks et al. (2005); Elola, Valdaliso, and López (2013); Gittins, Lang, and Sass (2015); Hansson, Husted, and Vestergaard (2005); Ivančič, Podmenik, and Hafner (2014); Muafi (2015); Ragin-Skorecka (2016); Rothschild and Darr (2005); Rutten and Boekema (2007); Silva and Reis (2015); Smedlund (2006); Smith (2009); Smith (2012); Tseng, Wang, and Yen (2014); van Burg et al. (2008); Wang and Ahmed (2004); Wilson, Coleman, and Herron (2008).
(3) Innovation and technology related field	As the intention was to analyze the dimensions of social capital in the innovation and technology field, it was decided to exclude papers addressing other fields (marketing, education, finance, etc.).	Bogers and Sproedt (2012), education/learning; Makkonen and Virtanen (2015), IT platform; Reich and Kaarst-Brown (2003), human resources management.
(4) Qualitative case study in an European context	This criterion was adopted because qualitative case studies make possible in- depth understandings (Merriam 2009) of the relationship intended to be investigated in the context of interest of the research (Europe)	Roman-Castillo and Smida (2013) and Tondolo et al. (2015), case studies held in South America (Colombia and Brazil, respectively).
(5) Quality assessment (methods, empirical evidence, theoretical contribution)	All studies were checked exhaustively to ensure that only quality insights and findings would be included in the meta-synthesis. Methodological rigor, empirical evidence-based findings, and theoretical contributions of each paper were assessed.	Valdaliso et al. (2011), we could not identify the methodological procedures adopted in the case study. The authors did not let clear if the empirical evidence was based on historical research or interviews with key actors (as stated in the abstract only)

Note. Source: Adapted from Hoon (2013: 535).

The fifth and last criterion was the most subjective one. As proposed by Hoon (2013), the quality of the papers should be assessed. In this regard, after exhaustive reading, the methodological rigour according to established standards for case studies (Eisenhardt, 1991; Merriam, 2009; Yin, 2013), empirical, evidence- based results, and relevant theoretical contribution of each of the nine studies were assessed.

One paper was excluded due to quality issues, remaining a final sample of eight case studies included in the meta-synthesis for case- specific analysis and cross-case analysis. Table 3 describes the papers considered and included in the investigation.

Table 3

Final sample of case studies included in the metasynthesis

Authors	Journal	Year	Impact factor (JCR / SJR /H)*
Al-Tabbaa and Ankrah	Technological Forecasting and Social Change	2016	2.678 /1.348/ 68
Camps and Marques	Technological Forecasting and Social Change	2014	2.678 / 1.348/ 68
Ehlen et al.	European Journal of Training & Development	2014	NA / 0.489/ 23
Hughes and Perrons	Journal of Business Research	2011	2.129 / 1.682/ 114
Masiello, Izzo, and Canoro	International Small Business Journal	2015	2.215 / 2.054 /46
Ozermir and Demırcı	Ege Akademik Bakış	2012	None
Partanen et al.	Industrial Marketing Management	2008	1.930 / 1.413/ 90
Steinmo	Industry and Innovation	2015	0.870 / 1.298 / 41

Note. *Journals' impact factor are the ratio a journal is cited related to the numbers of papers published by them in a given period. We collected the JCR is the Journal Citation Reports, provided by Thomson Reuters, SJR is the SCImago Journal Rank, provided by SCImago, and the H index provided by SCOPUS.

After the selection, exclusion, and inclusion of case studies to the final sample, the fourth step of the meta-synthesis was extracting and coding data from original studies.

Considering that this study relies on Hoon's (2013) research design, her coding and extracting form was adopted. However, given the specificity of this article's research question, it was decided to pretest the form with two randomly assigned studies of the sample. After the pretest, some items were added and excluded for creating a final form that would be more suitable to the proposed research question. The final ten items' form that was adopted for tabulating the eight selected case studies is presented in Table 4.

Table 4
Coding and extracting form

Item/question	Content
1. General details of the study	Authors; title, journal, volume, issue, pages, and year; and type of study (empirical or not).
2. What are the authors trying to achieve?	Broader aim(s) of the study; research question(s); and intended contributions.
3. Theoretical framing	Conceptual understanding of social capital used; conceptual understanding of innovation used; and theoretical relationship between social capital/innovation.
4. Setting/context in which study was conducted	Country; industry/sector; type of relationship (public–private, university– industry, B2B, etc.); focus of social capital (external/internal); type of innovation (radical/incremental, product/service, etc.); research context (dynamic or not/mature or nascent); research site selected (type of organization); and research setting (e.g. three technology-based companies).
5. Methodology/methods	Research design; approach (e.g., theory building/theory testing); unity of analysis; the number of cases included; and sampling strategy.
6. Data collection techniques and sources	Timing and sequencing (e.g., retrospective, real-time); data collection techniques; data sources (transcripts, field notes, archival data); and amount of data conducted/validity.
7. Data analysis approach	Methods of data analysis; and analysis techniques.
8. What are the proceeded insights? (verbatim paraphrased)	Key findings summarized by the original researcher(s) in abstract/introduction/conclusion sections; events, factors, or patterns in social capital portrayed by the original author(s); events, factors, or patterns in innovation/technology portrayed by the original author(s); and effects of social capital on innovation and technology as portrayed by the original author(s).
9. Discussion	Discussion of key findings; contribution(s) as stated by the original researcher(s); limitations as discussed by the authors; and limitations (e.g., methodological).
10. Overall assessment	How relevant is this study to underlying question?; how reliable/convincing is this study?; missing information/logical inconsistencies?; further assessment.

Note. Source: Adapted from Hoon (2013: 536-537).

Since new insights from meta-studies emerge from analysis of relationships (Point et al., 2017), for analysing case-specific level (step #6), it was performed an inductive causal network analysis (Miles & Huberman, 1994). It was looked for emerging variables, patterns, and relationships that could emerge in each case analysis. Additionally, they were coded according to reported insights of original researchers.

Whenever a significant relationship was found in case-specific analysis, it was listed signalling if the causal relationship was negative or positive (e.g., tie strength [relational dimension] (+) → overembeddedness [impediment]). After analysing each case separately, their central metaphors or concepts were maintained in order to compare them in a cross-study level for reaching a final synthesis (Point et al., 2017). In this step of the meta- synthesis (#7), the patterns of the variables that emerged from combining and comparing case studies are presented and accessed in Table 5, enhancing the validity of the constructs and relationships proposed (Hoon, 2013).

After verifying the variables and their ratings, a meta-causal network was created, enabling the identification of social capital

dimensions' (intraorganizational and interorganizational) variables, its antecedents, the facilitating and impeding factors to innovation, and the direct effects of social capital dimensions on innovation outcomes in European companies.

ANALYSIS AND SYNTHESIS CASE LEVEL-ANALYSIS

In this section, each case was analysed separately in order to consider their contextual and environmental idiosyncrasies (Hoon, 2013; Point et al., 2017). Al-Tabbaa and Ankrah (2016) investigated how social capital dimensions functioned as a facilitator of knowledge transfer in the case of Faraday Partnerships, in the United Kingdom. The authors investigated five University-Industry partnerships engineered by Faraday agency in two stages, preformation, and post-formation. They found that social capital dimensions have distinct roles before and after the establishment of relationships in interorganizational settings. In preformation stage, the presence of intermediaries or brokers and predefined objectives (Faraday rules) fostered the creation of social capital. In this regard, shared obligations and expectations in the relational dimension, and shared codes and narratives and mutual understanding in the cognitive dimension, were fundamental for reducing collaboration impediments such as lack of commonality in the background, fear of priority conflicts, and difficulty in recruiting suitable partners. In the post-formation stage, the structural dimension gained relevance, since social interaction and network ties played a key role by reducing the difficulty to match partners' capabilities. The structural dimension was also relevant for increasing relational and calculative trust (relational dimension) and shared codes and narratives and common understanding (cognitive dimension). The relational dimension in the post-formation stage was relevant for reducing self-interest and competitive opportunistic behaviour. On the other hand, the cognitive dimension helped reduce communication issues due to cross-sector (public-private) differences (Al-Tabbaa & Ankrah, 2016).

Table 5
Variables and ratings

Paper	Social capital antecedents	Dimensional interactions	Enablers / facilitators	Impediments / barriers / inhibitors	Direct effects	Social capital focus	Context	Country
Al-Tabbaa and Ankrah (2016)	Yes	Yes	Yes	Yes	No	External	Public-private	United Kingdom
Camps and Marques (2014)	No	No	Yes	No	No	Internal	Private (Industry)	Spain
Ehlen et al. (2014)	No	No	Yes	No	No	External	Public-private	The Netherlands
Hughes and Perrons (2011)	No	Yes	No	Yes	No	External	Private (Industry)	England
Masiello, Izzo, and Canoro (2015)	No	Yes	Yes	Yes	Yes	External	Public-private	Italy
Ozermir and Demırcı (2012)	Yes	Yes	No	No	Yes	Internal	Private (Industry)	Turkey
Partanen et al. (2008)	No	Yes	Yes	No	No	External	Public-private	Finland
Steinmo (2015)	Yes	Yes	Yes	Yes	No	External	Public-private	Norway

Note. Source: Adapted from Hoon (2013: 540-541).

Two studies were held within the European Nordic region concerning the University-Industry context. Partanen and his colleagues (2008) investigated the role of social capital in post-innovation stages, innovation assessment, business development, commercialization, and rapid growth, of three technology-based small-and-medium enterprises (SMEs) in Finland.

For this research, the focus was on the innovation assessment stage, which is closely tied to innovation development through knowledge, innovation, and technology (KIT) networks. The authors found that relational and cognitive dimensions of social capital are relevant for innovation assessment.

They claim that strong ties were relevant for joint learning and development, while weak ties were important for rapid and extensive learning of new ideas.

Sharing the same codes and language of academics was important for gathering effective communication to share technological development with universities. In this concern, sharing the same codes, languages, values, and norms made possible the increasing of relational trust necessary for innovation in knowledge- intensive settings.

It is noticeable that this study brings new insights regarding stage and timing of social capital dimensions and social capital development.

In turn, Steinmo (2015) studied six firms engaged in collaboration alliances with public research organizations (PROs) in Norway. She found that relational and cognitive dimensions of social capital are means to mitigate collaboration challenges between industries and universities on individual, firm, and alliance levels. In the relational dimension, mutual and close acquaintance, trust and openness, mutual engagement and commitment, and effective communication reduced collaboration challenges.

The cognitive aspect of social capital found to function as reducers of collaboration challenges were shared goals and languages, and common understanding. Thus, the structural dimension also had a minor role, since network cohesion and closeness, and the structure of collaboration helped reducing the alliances' challenges as well. This article brings insightful contributions to understanding social capital dimensions and its relationship with innovation from a multilevel perspective.

Masiello, Izzo, and Canoro (2015) proposed to investigate the effectiveness of structural, relational and cognitive configuration of social capital in the process of knowledge creation, transfer and sharing between SMEs and PROs in five innovation-driven networks in Italy.

The authors found that tie strength and network stability (structural dimension) facilitate innovation outcomes due to the faster and symmetrical learning during knowledge transfer process.

The governance informality, based on trust, reputation, and mutual expectations in constant multilevel personal exchanges were relational factors identified as innovation facilitators. In the cognitive dimension, they found that shared goals and vision, shared language and cultural background, and knowledge base complementarity were fundamental for innovation in the networks, increasing knowledge and information flow and absorptive capacity between the partners.

Another interesting finding regarding the relational dimension presented in the study was that intimacy and emotional commitment, allied with tie strength, led to over embeddedness, inertial trust (non-calculative behaviour), power asymmetry and mutual dependence (Masiello et al., 2015). Two cases in their sample presented such configuration, leading only to incremental innovation.

The authors argued that dyadic relationships have a life cycle in inverted U- shape. In this regard, initial stages of collaboration are highly formalized and less creative and innovative. In the exploration stage, they perceived a higher level of informality, creativity, and innovation.

Finally, in the exploitation stage, when revenues and dividends of the relationship are collected, they found higher levels of formalization and lesser levels of creativity and innovation.

This study was found to present a relevant contribution to the field by relating knowledge, social capital, and innovation through multiple cases in innovation-driven networks.

Another study with external focus proposed a framework where knowledge productivity, that is "the competence of individuals and groups to gradually improve and radically innovate in operating

procedures, products, and services" (Ehlen et al., 2014, p. 58), would mediate the relationship between social capital dimensions and organizational innovation. It is noteworthy that the authors added a fourth dimension, the action dimension, to Nahapiet and Ghoshal's (1998) framework.

However, for analytical generalization purpose, it was decided to narrow the focus on structural, relational, and cognitive dimensions in the meta-synthesis.

Through a multiple case study, involving six innovation groups engaged in the Healthcare Academy program in the Netherlands, the authors found that multidisciplinary network configuration and continuous participation (engagement) in the programme (structural dimension) increased knowledge productivity.

Concerning relational dimension, the factors that increased knowledge productivity were positive relationships (trust, motivation, appreciation, and sympathy), a mutual acquaintance, and collaboration.

In the cognitive dimension, the authors found that shared goals and values, common understanding, creativity, and collective subject- matter expertise affected the knowledge productivity positively, and hence, organizational innovation. Overall, the paper introduces interesting insights, but methodological inconsistencies and the lack of empirical support for some arguments were found.

Hughes and Perrons's (2011) article was the only study in the sample to investigate an interorganizational setting in the business-to- business (B2B) private context. The study was conducted in the English printing technology industry.

The authors found that deciding whether keeping an established technology or adopting a disruptive technology lead to divergent options regarding the dimensions of social in the buyer- supplier relationship. In this regard, time and resource constraints are inhibitors of social capital development. Given that tie strength (relational dimension) may lead to blindness of opportunity and relational dependence, the authors found that relying on weak ties and building cooperative norms would be effective for innovation assessment.

The authors' insights are relevant, but they do not provide much evidence that could help answering the meta-synthesis research question.

Two studies focused on the intraorganizational (internal) aspects of social capital dimensions in industrial settings. Camps and Marques (2014) proposed to investigate whether social capital dimensions would be heterogeneous within organizations, influencing different innovation capabilities. The research setting was one machinery industry from processing food industry in Spain. They identified two groups: high-identification groups (HIG) and medium-identification groups (MIG).

On the one hand, HIGs were found in dense network configurations (structural dimension), with strong ties, higher levels of trust and shared values, norms and obligations (relational dimension), and sharing a vision of organizational goals, codes, and narratives (cognitive dimension).

On the other hand, MIGs presented sparse network configurations (structural dimension), prevailing weaker ties (relational dimension), lower identification with the organization, weaker trust (relational dimension), and shared a vision of organizational goals, values, norms, and obligations (cognitive dimension) towards process efficiency and human relations.

For both groups, the relational dimension was linked to the following innovation enablers, goal alignment, associability, the concern of collective, collective action innovation flow, cooperation, knowledge enhancement, control mechanism, flexibility, a creative environment, and risk taking. The cognitive dimension was attached to goal alignment as innovation enabler (Camps & Marques, 2014).

Finally, Ozermir and Demırcı (2012) studied how social capital dimensions influenced radical innovation efforts in the aviation industry in Turkey. They found that structural aspects (tie redundancy) reduced innovation efforts. Tie strength, competence trust, and norm reciprocity were considered the positive influence on innovation efforts in the relational dimension of social capital. Regarding cognitive dimension, the authors argued that shared goals and common identity enhanced innovation efforts within the company.

CROSS-STUDIES SYNTHESIS

After analyzing each study individually, the next step is the cross-studies analysis that leads to the meta-synthesis. In this regard, the aim is to find a coherent pattern of relationships among the variables identified in the selected case studies.

The results of the meta-causal network analysis are depicted in Figure 1. It was noticed that every study presented some kind of dimensional relationships, that is, the dimensions are not isolated from each other, showing mutual influence in most of the cases.

In the model, it is represented through the intersection among the dimensions in the center of Figure 1.

It was also possible to find social capital dimensions' antecedents. It is argued that social capital may function fostering innovation directly, or even intermediating innovation outcomes through reducing barriers, impediments, and inhibitors or enhancing enablers and facilitators to innovation outcomes. As have been described in the case- level analysis, social capital dimensions play different roles depending on the focus of analysis. Thus, the meta-causal model was divided into external (interorganizational) and internal (intraorganizational) social capital.

In what refers to the interorganizational social capital, a relative balance among the contributions of each dimension was perceived, being the relational dimension the most prominent. In the structural dimension, it was found that intermediaries and brokers are antecedents of the formation of network ties.

Despite not having a direct effect on innovation outcomes, network ties influence relational and cognitive dimensions. In the relational

dimension, they are predictors of how calculative and relational trust are built.

Calculative trust emerges from positive expectations of gains based on rational choices, while relational trust is based on positive emotions and appreciation resulting from regular interactions (Al-Tabbaa & Ankrah, 2016).

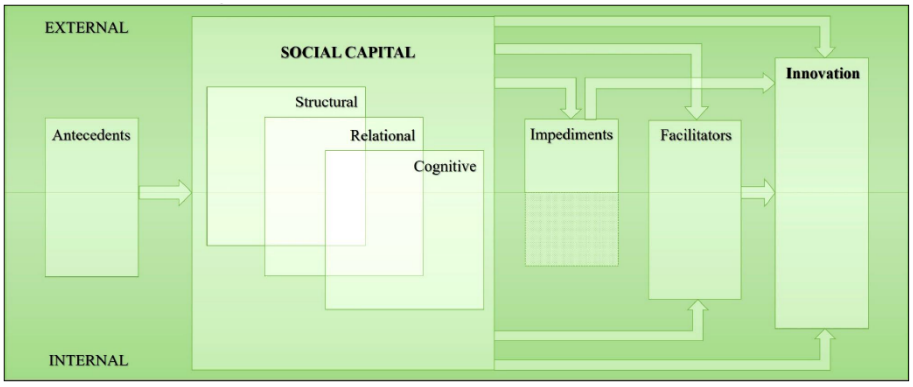

Figure 1
Meta-causal framework of relations of social capital dimensions and innovation.

Another variable in the structural dimension affecting relational trust is network memory or past ties. In this concern, when collaboration is based on previous relationships, relational trust is more likely to emerge. Network ties are also expected to produce effects on cognitive dimension of social capital by increasing the likelihood of shared codes and narratives, and of common understanding among the parties.

Concerning innovation enablers in the structural dimension, data suggest that network configuration or structure may increase knowledge productivity (Ehlen et al., 2014). Positional advantage and reputation may facilitate the access to venture capital investments when an alliance needs to implement innovations (Partanen et al., 2008).

Regarding the mitigation of innovation impediments, finding an adequate network configuration or structure helps reducing collaboration challenges and the risk of non- matching capabilities within the network.

Cohesion and closeness is another variable responsible for reducing collaboration challenges. However, tie stability may reduce rapid and extensive learning due to the lack of new knowledge acquisition and limited information flow. Evidence also suggest that having indirect ties, multilevel interactions and exchanges between collaboration partners, and tie stability may have direct positive effects on innovation outcomes (Masiello et al., 2015).

In the relational dimension of social capital in interorganizational networks, more complex results were found when compared to the structural dimension. As antecedents, it is suggested that the amount of time and resource allocation will increase the mutual commitment and engagement in the collaboration.

Furthermore, alliances formed through intermediaries and brokers with predefined objectives are more likely to have shared norms and

clear perceptions of mutual obligations and expectations. It was also perceived significant dimensional relationships. Intimacy and emotional commitment and openness to partners are found to increase shared codes and narratives and common understanding in the cognitive dimension. Mutual commitment and engagement are considered factors with the potential to increase the extent of network ties in the structural dimension. We also perceived intradimensional relationships, as tie strength increases shared norms among partners, but may also lead to relational dependence. Another issue that might be noticed is that throughout longstanding collaboration, partners may lose the notion of efficiency gains, keeping relationships that are no longer beneficial to the parties, what is called an inertial trust (Masiello et al., 2015).

Variables in the relational dimension that leads to innovation enablers or reduces the barriers to innovation were also found. Knowledge productivity (innovation enabler) increases in the presence of relational trust, presenting positive relationships among the parties when there is the perception of mutual engagement and commitment, close acquaintance, and mutual collaboration and expectation.

Another enabler, joint learning and development, occur when the relationships comprise strong ties. Regarding barriers, collaboration challenges may be mitigated through effective communication, mutual engagement, and commitment, close acquaintance, openness to partners, and shared norms.

Opportunistic behaviours are avoided when collaborations have relational and calculative trust and openness to partners. Relational trust, along with shared obligations and expectations, helps reduce the fear of priority conflicts and partner suitability challenges.

However, there is a limit to engagement in this dimension. Excess of intimacy and emotional commitment and tie strength may lead the collaboration to over embeddedness and blindness of opportunity.

This process may be reversed through power symmetry and mutual dependency (Masiello et al., 2015). Furthermore, innovation outcomes are more likely to be directly and positively affected when the network is formed by strong ties with relational trust, presenting informal governance structures with the prevalence of power symmetry and mutual dependency, that is, when collaboration and expectations are balanced among all partners.

In the lower half of Figure 1, the relational model of intraorganizational social capital is represented.

The presence of almost the same elements contained in the model for interorganizational networks (antecedents, enablers, and direct effects on innovation outcomes) were noticed, except for barriers, impediments or inhibitors. Additionally, the analysis suggest that the dimensions of social capital are not as balanced as have been perceived in the interorganizational setting.

For instance, only one variable of the structural dimension with negative direct effect on innovation outcomes was identified, tie redundancy. In this regard, for internal networks, the diversity of ties may

be more effective for gathering new knowledge and information (Ozermir & Demırcı, 2012).

Concerning the cognitive dimension, only shared goals, vision, and values are relevant for providing a favourable environment for innovation.

Personal commitment from employees, ethic values, and higher relational competence are predictors of shared goals, vision, and values, that, in turn, increases the chance for getting innovation enablers such as effective control mechanisms, collective action, internal cooperation, the concern of collective, risk- taking propensity, and goal alignment.

In intraorganizational networks, the relational dimension of social capital is more valuable if compared to structural and cognitive dimensions. Relational trust, which is preceded by a personal commitment from employees, ethic values, and relational competence, increases the effectiveness of control mechanism, leads to internal cooperation, collective action, and associability as innovation enablers.

Other facilitating factors related to relational trust are the development of a creative environment, the better flow of information and elevated risk-taking propensity. Mutual commitment and engagement, shared norms, and shared identity are the relational variables that were found to lead to the improvement of organizational control mechanisms. Collective action, the concern of collective, internal cooperation, associability, better information flow, and knowledge enhancement, were found to impact directly on innovation outcomes as well.

Looking into internal social capital, an intradimensional relation between tie strength and trust was perceived. Strong ties are more likely to lead to competence trust, that is, one partner trust in the capacity of others to perform their jobs effectively, while weak ties are more likely to lead to benevolence trust, that is, one partner trust that others will look out for his welfare (Levin et al., 2016; Ozermir & Demırcı, 2012).

Regarding observed direct effects, it is argued that competence trust, shared norms, shared identity, and tie strength are positively related to innovation outcomes in intraorganizational networks.

It is noteworthy that case studies focusing internal or intraorganizational settings are yet to address to role of social capital as an impediment of innovation and technology development.

As it is represented in Figure 1, the dotted lines show the absence of relationship between social capital and impediments of innovation. However, it is not denied the existence of impediments, they have only been neglected in the sampled case studies.

DISCUSSION AND CONCLUSION

This article investigated through a meta- synthesis (Hoon, 2013) how structural, relational and cognitive dimensions of social capital (Nahapiet & Ghoshal, 1998) are related to innovation and technology in organizations.

The assumption that innovation outcomes in organizations and networks go beyond structural variables (Adler & Kwon, 2002; Kwon & Adler, 2014), such as density, centrality, cohesion, and centralization, was assumed.

Thus, in-depth case studies may be suitable for understanding the complexity of the relationships among and within organizations, in which knowledge, information, and resources are exchanged not only through rational and economic means.

The results of this study suggest that social capital dimensions play different roles according to the level of relationship analysed.

In interorganizational networks, relational aspects are prominent, while structural and cognitive dimensions are relevant, but to a lesser extent.

On the other hand, in intraorganizational settings, relational social capital is fundamental, and structural and cognitive dimensions play secondary roles for explaining innovation, contradicting previous findings of Tsai and Ghoshal (1998). The authors found that all three dimensions presented significant roles in the resource exchange and combination, which in turn, led to innovation.

However, size and contextual factors might explain such differences, since their results were based on a study of a large multinational, while in this article the authors investigated small and medium-sized companies (Camps & Marques, 2014; Ozermir & Demırcı, 2012).

Concerning relational dimension, while in previous study tie strength was the only relational variable found to lead to innovation (Maurer et al., 2011), the model proposed in this article indicates that relational trust, shared norms, shared identity, and mutual commitment and engagement are also relevant factors explaining innovation, directly or not.

In what concerns to interorganizational networks, the findings are consistent with previous literature (e.g., Ahuja, 2000; Levin et al., 2016; Nambisan & Sawhney, 2011). Structurally, both weak and strong ties are relevant for gathering innovation in interorganizational alliances. Extensive and stable networks, with fewer "turnover" ratios, are more likely to develop trust, knowledge productivity, and cognitive alignment among partners. In this regard, this finding is aligned with Levin and Cross (2004) in what regards to the claiming that trust and trustworthiness are essential for knowledge creation and transfer since networks with positive innovation results presented informal governance structures. Thus, since that network memory constituted by previously known ties is regarded as a source of relational trust, it is suggested that it is an interesting avenue for future studies for those interested in the relation between social capital dimensions and innovation outcomes.

In the relational dimension, it was found that mutual commitment and engagement is a notably relevant variable for explaining innovation outcomes in interorganizational networks, what is consistent with recent arguments in innovation and technology studies (Hammarfjord & Roxenhall, 2017). Thus, time and resource allocation from all partners

engaged in the collaboration are a source of network commitment and engagement.

It is noticeable that engaged and committed organizations are important for network expansion since bringing new ties to the alliance is favourable for generating new non-redundant knowledge and information.

Consequently, the more committed to network the organizations are, the more likely they are to achieve innovation outcomes in technological contexts.

This article's findings regarding the cognitive dimension of social capital are aligned with Nahapiet and Ghoshal's (1998) propositions. Even in cross-sector or cross- industry collaborations, developing shared languages and narratives and a common understanding is important for achieving innovation outcomes.

Relational aspects of social capital, especially relational trust, shared norms, and tie strength, are important sources of these cognitive variables (Al-Tabbaa & Ankrah, 2016). In this dimension, shared goals, vision, and values, is the only factor identified as relevant in both network contexts, interorganizational and intraorganizational.

The meta-synthesis also presented an unexpected outcome. During the investigation, it was possible to address a subject of interest of a growing body of scholars interested in the study of networks, the dark side of social capital (Kwon & Adler, 2014; Labianca & Brass, 2006; Portes, 2014). In this matter, evidence to agree with Molina-Morales and colleagues (2011) when they assert that too much relational trust may have a negative effect on innovation outcomes were found. Despite being fundamental for knowledge creation and transfer among organizations, in excess, it may lead to over embeddedness (Masiello et al., 2015; Uzzi, 1997). As a consequence, organizations may become, borrowing the expression from Gargiulo and Benassi (2000), trapped in their own net. In this concern, inertial trust, relational dependence, the blindness of opportunities and power and resource asymmetry (Gulati & Sytch, 2007; Hughes & Perrons, 2011) may become pitfalls for organizations to gather novel knowledge and information in order to innovate.

The resulting framework of the meta- synthesis contributes to the extant literature by showing that social capital dimensions are relevant sources of innovation in both intraorganizational and interorganizational networks. This influence is threefold. First, it is a source of innovation outcomes by enhancing or improving innovation enablers and facilitators.

Second, it helps organizations to innovate by mitigating or reducing barriers, impediments, or inhibitors that block innovation in interorganizational networks. Third, social capital dimensions may also be direct sources of innovation for organizations, even under the influence of idiosyncratic contexts, cultures, and institutions (Sahin, Nijkamp, & Stough, 2009). Additionally, variables that may be antecedents of social capital were presented, opening the path for further investigations on social capital development.

This study, however, presents some limitations. Despite the efforts to locate all relevant case studies about social capital and innovation, it is likely that some relevant cases were not located given the focus on three databases only.

Another limitation, inherent to the method adopted for conducting this research, is that the analysis relies on another researcher's insights and interpretation of data, being susceptible to their bias. Still, adopting qualitative case studies insights for getting to an analytical generalization reduces the deepness, richness, and contextual dependence of original authors' findings. Furthermore, even considering that the sample was composed of distinct industries and contexts within Europe, case studies from other regions in the globe could present different results if compared to European reality depicted in this study. Finally, the quantitative character of its original constructs may disguise the relevance of the structural dimension of social capital since they were evaluated by means of qualitative data sources.

This investigation opens diverse possibilities for future studies. The proposed framework could be analysed in new empirical situations, considering collaborations on distinct contexts (public-private, B2B, etc.). The role of social capital dimensions in the impediments or barrier to innovation could be explored further. Research in this matter could foster collaboration among isolate organizations (lone wolves) which despite having available resources and knowledge, are not motivated to be embedded in innovation-driven networks (Kwon & Adler, 2014).

Another possibility would be the investigation of the extent of the limits of the bright side of social capital before it turns into the dark side. A possible contribution would be the avoidance of innovation inhibitors such as overembededdness, inertial trust, and asymmetric relationships.

REFERENCES

Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 27*(1), 17-40. http://dx.doi.org/10.5465/AMR.2002.5922314

Ahearne, M., Lam, S. K., & Kraus, F. (2014). Performance impact of middle managers' adaptive strategy implementation: The role of social capital. *Strategic Management Journal, 35*(1), 68-87. http://dx.doi.org/10.1002/smj.2086

Ahuja, G. (2000). Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly, 45*(3), 425-455. http://dx.doi.org/10.2307/2667105

Al-Tabbaa, O., & Ankrah, S. (2016). Social capital to facilitate 'engineered' university-industry collaboration for technology transfer: A dynamic perspective. *Technological Forecasting and Social Change, 104*, 1-15. http://dx.doi.org/10.1016/j.techfore.2015.11.027

Alguezaui, S., & Filieri, R. (2010). Investigating the role of social capital in innovation: sparse versus dense network. *Journal of Knowledge Management, 14*(6), 891-909. http://dx.doi.org/10.1108/13673271011084925

Allameh, S. M. (2018). Antecedents and consequences of intellectual capital: The role of social capital, knowledge sharing and innovation. *Journal of Intellectual Capital*. http://dx.doi.org/10.1108/JIC-05-2017-0068

Becker, W., & Dietz, J. (2004). R&D cooperation and innovation activities of firms- evidence for the German manufacturing industry. *Research Policy, 33*(2), 209-223. http://dx.doi.org/10.1016/j.respol.2003.07.003

Ben-Hador, B. (2016). How intra- organizational social capital influences employee performance. *Journal of Management Development, 35*(9), 1119-1133. http://dx.doi.org/10.1108/JMD-12-2015-0172

Best, J. (2015). Beyond case studies: Expanding the constructionist framework for social problems research. *Qualitative Sociology Review, 11*(2), 18-33.

Borgatti, S. P., Jones, C., & Everett, M. G. (1998). Network measures of social capital. *Connections, 21*(2), 27-36.

Bourdieu, P. (1985). The forms of capital. In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood.

Bozeman, B. (2000). Technology transfer and public policy: a review of research and theory. *Research Policy, 29*(4), 627-655. http://dx.doi.org/10.1016/S0048-7333(99)00093-1

Bozeman, B., & Link, A. N. (2015). Toward an assessment of impacts from US technology and innovation policies. *Science and Public Policy, 42*(3), 369–376. http://dx.doi.org/10.1093/scipol/scu058

Breiger, R. L. (2004). The analysis of social networks. In M. A. Hardy & A. Bryman (Eds.), *Handbook of Data Analysis* (pp. 505-526). London, UK: Sage Publications.

Burt, R. S. (1992). Structural holes: the social structure of competition. In R. G. Eccles & N. Nohria (Eds.), *Network and organizations: structure, form and action* (pp. 57-93). Boston, MA: Harvard Business School Press.

Burt, R. S. (2001). Structural holes versus network closure as social capital. In N. Lin, K. S. Cook, & R. S. Burt (Eds.), *Social capital: theory and research* (pp. 31-56). New Brunswick, NJ: Transaction.

Camps, S., & Marques, P. (2014). Exploring how social capital facilitates innovation: The role of innovation enablers. *Technological Forecasting and Social Change, 88*, 325-348. http://dx.doi.org/10.1016/j.techfore.2013.10.008

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*(Supplement), S95-S120. http://dx.doi.org/10.1086/228943

Davis, J. P. (2016). The group dynamics of interorganizational relationships collaborating with multiple partners in innovation ecosystems. *Administrative Science Quarterly, 61*(4), 621-661. http://dx.doi.org/10.1177/0001839216649350

Doornich, J. B. (2018). Managerial learning from social capital during internationalization. *International Business Review, 27*(4), 877-892. http://dx.doi.org/10.1016/j.ibusrev.2018.01.010

Ehlen, C., van der Klink, M., Roentgen, U., Curfs, E., & Boshuizen, H. (2014). Knowledge productivity for sustainable innovation: social capital as HRD target. *European Journal of Training & Development, 38*(1/2), 54-74. http://dx.doi.org/10.1108/EJTD-10-2013-0119

Eisenhardt, K. M. (1991). Better stories and better constructs: The case for rigor and comparative logic. *Academy of Management Review, 16*(3), 620-627. http://dx.doi.org/10.5465/AMR.1991.4279496

Engbers, T., Rubin, B. M., & Aubuchon, C. (2017). The currency of connections: An analysis of the urban economic impact of social capital. *Economic Development Quarterly, 31*(1), 37-49. http://dx.doi.org/10.1177/0891242416666673

Filieri, R., McNally, R. C., O'Dwyer, M., & O'Malley, L. (2014). Structural social capital evolution and knowledge transfer: Evidence from an Irish pharmaceutical network. *Industrial Marketing Management, 43*(3), 429-440. http://dx.doi.org/10.1016/j.indmarman.2013.12.0 11

Fukuyama, F. (2001). Social capital, civil society and development. *Third World Quarterly, 22*(1), 7-20. http://dx.doi.org/10.1080/713701144

Gargiulo, M., & Benassi, M. (2000). Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organization Science, 11*(2), 183-196. http://dx.doi.org/10.1287/orsc.11.2.183.12514

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360-1380. http://dx.doi.org/10.1086/225469

Granovetter, M. S. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociology, 91*(3), 481-510. http://dx.doi.org/10.1086/228311

Granovetter, M. S. (1992). Economic institutions as social constructions: a framework for analysis. *Acta Sociologica, 35*(1), 3-11. http://dx.doi.org/10.1177/000169939203500101

Gubbins, C., & Dooley, L. (2014). Exploring social network dynamics driving knowledge management for innovation. *Journal of Management Inquiry, 23*(2), 162-185. http://dx.doi.org/10.1177/1056492613499203

Gulati, R., Lavie, D., & Madhavan, R. R. (2011). How do networks matter? The performance effects of interorganizational networks. *Research in Organizational Behavior, 31*, 207-224. http://dx.doi.org/10.1016/j.riob.2011.09.005

Gulati, R., & Sytch, M. (2007). Dependence asymmetry and joint dependence in interorganizational relationships: Effects of embeddedness on a manufacturer's performance in procurement relationships. *Administrative Science Quarterly, 52*(1), 32-69. http://dx.doi.org/10.2189/asqu.52.1.32

Hammarfjord, M. O., & Roxenhall, T. (2017). The relationships between network commitment, antecedents, and innovation in strategic innovation networks. *International Journal of Innovation Management, 21*(6), 17500371-175003736.http://dx.doi.org/10.1142/S1363919617500372

Hoon, C. (2013). Meta-synthesis of qualitative case studies an approach to theory building. *Organizational Research Methods, 16*(4), 522-556. http://dx.doi.org/10.1177/1094428113484969

Hosnedlova, R. (2017). Embedded settlement intentions: The case of Ukrainians in Madrid. *Social Networks, 49*, 48-66. http://dx.doi.org/10.1016/j.socnet.2016.11.001

Hughes, M., & Perrons, R. K. (2011). Shaping and re-shaping social capital in buyer–supplier relationships. *Journal of Business Research, 64*(2), 164-171. http://dx.doi.org/10.1016/j.jbusres.2009.12.009

Inkpen, A. C., & Tsang, E. W. K. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review, 30*(1), 146-165. http://dx.doi.org/10.5465/AMR.2005.15281445

Ivancic, A., Podmenik, D., & Hafner, A. (2014). Independent inventors, social capital, and knowledge transfer - the case of Slovenia. *Innovation: The European Journal of Social Science Research, 27*(3), 238-253. http://dx.doi.org/10.1080/13511610.2014.943161

Karahanna, E., & Preston, D. S. (2013). The effect of social capital of the relationship between the CIO and top management team on firm performance. *Journal of Management Information Systems, 30*(1), 15-56. http://dx.doi.org/10.2753/MIS0742-1222300101

Kilduff, M., & Brass, D. J. (2010). Organizational social network research: Core ideas and key debates. *Academy of Management Annals, 4*(1), 317-357. http://dx.doi.org/10.1080/19416520.2010.494827

Krackhardt, D. (1992). The strength of strong ties: the importance of philos in organizations. In N. Nohria & R. G. Eccles (Eds.), *Networks and Organizations: Structure, Form, and Action* (pp. 216-239). Boston, MA: Harvard Business School Press.

Kwon, S.-W., & Adler, P. S. (2014). Social capital: Maturation of a field of research. *Academy of Management Review, 39*(4), 412-422. http://dx.doi.org/10.5465/amr.2014.0210

Labianca, G., & Brass, D. J. (2006). Exploring the social ledger: Negative relationships and negative asymmetry in social networks in organizations. *Academy of Management Review, 31*(3), 596-614. http://dx.doi.org/10.5465/AMR.2006.21318920

Landry, R., Amara, N., & Lamari, M. (2002). Does social capital determine innovation? To what extent? *Technological Forecasting and Social Change, 69*(7), 681-701. http://dx.doi.org/10.1016/S0040-1625(01)00170-6

Levin, D. Z., & Cross, R. (2004). The Strength of Weak Ties You Can Trust: The Mediating Role of Trust in Effective Knowledge Transfer. *Management Science, 50*(11), 1477-1490.

Levin, D. Z., Walter, J., Appleyard, M. M., & Cross, R. (2016). Relational enhancement: How the relational dimension of social capital unlocks the value of network-bridging ties. *Group & Organization Management, 41*(4), 415-457. http://dx.doi.org/10.1177/1059601115574429

Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology, 25*, 467- 487.

Malik, T. (2012). Disparate association between alliance social capital and the global pharmaceutical firm's performance. *International Business Review, 21*(6), 1017-1028. http://dx.doi.org/10.1016/j.ibusrev.2011.11.007

Masiello, B., Izzo, F., & Canoro, C. (2015). The structural, relational and cognitive configuration of innovation networks between SMEs and public research organisations. *International Small Business Journal, 33*(2), 169-193. http://dx.doi.org/10.1177/0266242613485610

Maurer, I., Bartsch, V., & Ebers, M. (2011). The value of intra-organizational social capital: How it fosters knowledge transfer, innovation performance,

and growth. *Organization Studies, 32*(2), 157-185. http://dx.doi.org/10.1177/0170840610394301

Merriam, S. B. (2009). *Qualitative Research: A Guide to Design and Implementation*. San Francisco, CA: Jossey-Bass.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage.

Molina-Morales, F. X., Martínez-Fernández, M. T., & Torlò, V. J. (2011). The dark side of trust: The benefits, costs and optimal levels of trust for innovation performance. *Long Range Planning, 44*(2), 118-133. http://dx.doi.org/10.1016/j.lrp.2011.01.001

Moran, P. (2005). Structural vs. relational embeddedness: Social capital and managerial performance. *Strategic Management Journal, 26*(12), 1129-1151. http://dx.doi.org/10.1002/smj.486

Mouw, T. (2006). Estimating the causal effect of social capital: A review of recent research. *Annual Review of Sociology, 32*, 79-102. http://dx.doi.org/10.1146/annurev.soc.32.061604. 123150

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242-266. http://dx.doi.org/10.5465/AMR.1998.533225

Nambisan, S., & Sawhney, M. (2011). Orchestration processes in network-centric innovation: Evidence from the field. *Academy of Management Perspectives, 25*(3), 40-57. http://dx.doi.org/10.5465/amp.2011.63886529

Ozermir, A. A., & Demırcı, A. E. (2012). Impact of social capital on radical innovation efforts of the organizations: A case in the aviation industry. *Ege Akademik Bakış, 12*(1), 53-66. http://dx.doi.org/10.21121/eab.2012119546

Partanen, J., Möller, K., Westerlund, M., Rajala, R., & Rajala, A. (2008). Social capital in the growth of science-and-technology-based SMEs. *Industrial Marketing Management, 37*(5), 513-522. http://dx.doi.org/10.1016/j.indmarman.2007.09.0 12

Point, S., Fendt, J., & Jonsen, K. (2017). Qualitative inquiry in management: Methodological dilemmas and concerns in meta - analysis. *European Management Review, 14*(2), 185-204. http://dx.doi.org/10.1111/emre.12097

Portes, A. (1998). Social capital: its origins and applications in modern sociology. *Annual Review of Sociology, 24*(1), 24. http://dx.doi.org/10.1146/annurev.soc.24.1.1

Portes, A. (2014). Downsides of social capital. *Proceedings of the National Academy of Sciences, 111*(52), 18407-18408. http://dx.doi.org/10.1073/pnas.1421888112

Powell, W. W. (1998). Learning from collaboration: Knowledge and networks in the biotechnology and pharmaceutical industries. *California Management Review, 40*(3), 228-240. http://dx.doi.org/10.2307/41165952

Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly, 41*(1), 116-145. http://dx.doi.org/10.2307/2393988

Powell, W. W., White, D. R., Koput, K. W., & Owen - Smith, J. (2005). Network dynamics and field evolution: The growth of interorganizational collaboration in the life sciences. *American Journal of Sociology, 110*(4), 1132-1205. http://dx.doi.org/10.1086/421508

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.

Rowley, T., Behrens, D., & Krackhardt, D. (2000). Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal, 21*(3), 369-386. http://dx.doi.org/10.1002/(SICI)1097-0266(200003)21:3<369::AID-SMJ93>3.0.CO;2-M

Ruef, M. (2002). Strong ties, weak ties and islands: structural and cultural predictors of organizational innovation. *Industrial and Corporate Change, 11*(3), 427-449. http://dx.doi.org/10.1093/icc/11.3.427

Sahin, M., Nijkamp, P., & Stough, R. R. (2009). Socio-cultural drivers of innovation. *Innovation: The European Journal of Social Science Research, 22*(3), 247-249. http://dx.doi.org/10.1080/13511610903354992

Shah, N. P., Levin, D. Z., & Cross, R. (2018). Secondhand social capital: Boundary spanning, secondhand closure, and individual performance. *Social Networks, 52*, 18-27. http://dx.doi.org/10.1016/j.socnet.2017.04.005

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management, 37*(5), 1390-1412. http://dx.doi.org/10.1177/0149206310385695

Sorenson, O., & Rogan, M. (2014). (When) do organizations have social capital? *Annual Review of Sociology, 40*, 261-280. http://dx.doi.org/10.1146/annurev-soc-071913- 043222

Steinmo, M. (2015). Collaboration for innovation: A case study on how social capital mitigates collaborative challenges in university– industry research alliances. *Industry and Innovation, 22*(7), 597-624. http://dx.doi.org/10.1080/13662716.2015.1105127

Tian, J. J., Haleblian, J. J., & Rajagopalan, N. (2011). The effects of board human and social capital on investor reactions to new CEO selection. *Strategic Management Journal, 32*(7), 731-747. http://dx.doi.org/10.1002/smj.909

Tomlinson, P. R. (2012). Industry institutions, social capital, and firm participation in industrial development. *Industrial and Corporate Change, 21*(1), 1-29. http://dx.doi.org/10.1093/icc/dtr028

Tsai, W. (2000). Social capital, strategic relatedness and the formation of intraorganizational linkages. *Strategic Management Journal, 21*(9), 925-939. http://dx.doi.org/10.1002/1097-0266(200009)21:9<925::AID-SMJ129>3.0.CO;2-I

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal, 41*(4), 464-476. http://dx.doi.org/10.2307/257085

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*(1), 35-67. http://dx.doi.org/10.2307/2393808

Vasudeva, G., Zaheer, A., & Hernandez, E. (2013). The embeddedness of networks: Institutions, structural holes, and innovativeness in the fuel cell industry. *Organization Science, 24*(3), 645-663. http://dx.doi.org/10.1287/orsc.1120.0780

Whittington, K. B., Owen-Smith, J., & Powell, W. W. (2009). Networks, propinquity, and innovation in knowledge-intensive industries. *Administrative Science Quarterly, 54*(1), 90-122 http://dx.doi.org/10.2189/asqu.2009.54.1.90

Yan, Y., & Guan, J.-C. (2018). Social capital, exploitative and exploratory innovations: The mediating roles of ego-network dynamics. *Technological Forecasting and Social Change, 126*, 244-258. http://dx.doi.org/10.1016/j.techfore.2017.09.004

Yin, R. K. (2013). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

Notes

4 For the detailed search parameters and respective results in each electronic database, see Appendix A.

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