The role of leadership capabilities in Smart Specialisation Strategies: comparative case studies in two Latin American regions

Ana Carolina Iga-César

ABSTRACT
This paper empirically investigates the leadership implications of adopting the European Smart Specialisation Strategies (S3) in a non-European context. A multiple case study compares the Latin American regions of Medellín, Colombia, and San Luis Potosí, Mexico. A variety of data collection procedures are used, including in-depth interviews with 33 relevant actors from the triple helix that participated in the S3 design. The paper contributes to the literature by identifying the leadership capabilities that lead to effective S3 in intermediate metropolitan regions, as well as the factors that foster and hinder those leadership capabilities. This paper argues that the leadership roles for S3 include a systemic perspective among a wide range of stakeholders, but also an evolutionary perspective to manage novelty and break path dependencies. Second, it argues that the degree of centralization and institutional context affect regional leadership. Finally, four leadership capabilities are suggested based on both systemic and evolutionary perspectives.

ARTICLE HISTORY
Received 13 June 2021; Accepted 28 March 2022

KEYWORDS
leadership; Smart Specialisation Strategies; Mexico; San Luis Potosí; Medellín; regional strategy

INTRODUCTION
The innovation policy debate of the last decade has been shaped by the concept of the Smart Specialisation Strategies (S3) that emerged in Europe as an ex-ante conditionality for regions to access the European Regional Development Funds (ERDF). Despite its European origin, the approach has been adopted beyond the European Union’s (EU) boundaries, especially in regions that are not leaders in science and technology, for whom the strategy was argued to be ‘crucial’ (Foray et al., 2009). The idea behind S3 is to prioritize specialization domains through an entrepreneurial discovery process (EDP), a process in which members of the triple helix (Etzkowitz & Leydesdorff, 2000), composed by industry, government and knowledge organizations, interact and discover the ways in which an economy can diversify based on current strengths and knowledge assets. Therefore, it aims at diversifying in a specialized way to transform the regional economic structure for a comparative advantage (Foray et al., 2009).

During the past decades, the literature of economic geography has focused on understanding why some regions perform better than others. Most analyses have focused on regional
characteristics according to *hard* economic elements such as the stage of economic development (Trippel et al., 2020; Foray, 2019) and income level (Lee, 2017). However, the literature has also focused on *softer* social features. First, by incorporating a systemic perspective (Tödtling & Trippel, 2005), which helps understand the system disadvantages of less developed systems in the context of S3 (Bläžek et al., 2014; Vallance et al., 2017), with a particular emphasis on peripheral regions (Grillitsch & Nilsson, 2015). Second, by emphasizing the role of institutions, including those informal institutions related to regional values and culture (Grillitsch, 2016; Rodriguez-Pose, 2013).

In addition, researchers have increasingly demanded consideration of the human factor in regional studies (Aranguren et al., 2015; Collinge & Gibney, 2010a; Gibney, 2011; Sotarauta, 2005). Collinge and Gibney (2010a) argue that the role of leadership for economic development ‘still receives insufficient attention in an ongoing debate around policy prescriptions that remains heavily informed by ‘hard’ economic theory’ (p. 380), while softer relational interactions and the power of human agency need to be explored, especially because local and regional institutions and systems are driven by people. Interest in place leadership, considered ‘the missing piece in the local and regional development puzzle’ (Sotarauta, 2016, p. 46), has grown in the last decade (Sotarauta & Beer, 2017). Moreover, effective leadership is expected to ‘explain how and why some localities are able to adapt and exploit the opportunities afforded by the complex and rapidly changing social and economic circumstances of the modern world’ (Collinge et al., 2010, p. 367).

In the context of S3, the human factor is highly relevant, especially in the design phase, where individuals from the triple helix contribute with their own perceptions, values and vision. However, although leadership is regarded as one of the seven principles for the governance of S3 (Gianelle et al., 2016, p. 38), the consideration of place leadership in the context of Smart Specialisation has been rather limited, with few exceptions (e.g., Aranguren et al., 2015; Sotarauta, 2018). In a similar line of thought, the human factor is key for understanding the dynamic capabilities of individuals and groups of individuals to break with the bast (Bailey et al., 2010) and adapt to the rapid changes, which are especially evident in territories. Therefore, the relevance of understanding leadership dynamics of the S3 strategy is strengthened by two perspectives: on the one hand, a systemic perspective on leadership to face a bottom-up strategy with a wide range of stakeholders; and on the other, a more evolutionary perspective on leadership, emphasizing the relevance of human agency as a capability to adapt and reach structural changes. From both perspectives, regional leadership capabilities must be developed. Leadership capabilities in regions are understood as ‘a regional innovation system’s ability to effectuate actions, steering the processes and resources of the system in the desired direction and avoiding harmful lock-ins’ (Harmakorpi, 2006, p. 1088).

Building on the growing body of literature on place leadership and S3, this paper explores the leadership dynamics in large metropolitan regions in Latin America. In contrast to the *ex-ante* conditionality of the EU context, these countries and regions were immersed in reflection about the adequacy of this approach. The role of leadership in place-based approaches has been explored in the context of peripheral and rural areas with limited connections (Beer, 2014; Kroehn et al., 2010), as well as in old industrial regions in Europe where path dependency is a major challenge (Bailey et al., 2010). However, there is insufficient research on the role of leadership in metropolitan areas in intermediate economies, where, on the one hand, place-based strategies such as S3 are argued as important (Foray, 2019), given a critical mass and important institutions, while, on the other, structural change is difficult because policy and governance systems remain weak (Kroll, 2015). In addition, it is crucial to reach beyond Europe and Australia and include studies from other parts of the world in the repertoire of leadership for regional development.
Accordingly, this paper uses a case study approach to explore the leadership dynamics followed by Medellín, Colombia, and San Luis Potosí, Mexico, during the design phase, understood as the process comprehended between the decision of implementing S3 for the studied region and the delivery of the written document with established priorities. More concretely, it focuses on these questions: How do place leadership capabilities shape the design of S3 in non-European intermediate regions? What are the leadership capabilities that enable an effective S3 process, considering both systemic and evolutionary perspectives?

The paper’s contributions to the literature are threefold. First, it argues that the leadership roles for S3 include a systemic but also an evolutionary perspective to manage novelty and break path dependencies. Second, it argues that the degree of centralization and institutional context shape regional leadership. Finally, four leadership capabilities are suggested based on both systemic and evolutionary perspectives, thus contributing to the scholarly debate about the importance of human agency in regional development. In addition, the paper includes implications for policymaking for metropolitan areas in intermediate regions and evidence on place-based leadership in Latin America.

In the following sections, the role of leadership for Smart Specialisation is explored. Then the methodology adopted for data collection is presented, followed by an analysis of the case studies. The article concludes with a discussion, including the policy implications and a conclusions section.

LITERATURE REVIEW: PLACE LEADERSHIP AND SMART SPECIALISATION STRATEGIES

Place-based leadership has gained importance in regional studies, especially over the last decade. The complexity of territories, where a wide array of stakeholders interact, sharing both geography and history, has led to the development of a ‘new leadership of place’ framework (Gibney et al., 2009), where leadership plays an ‘amplifying role’ (Stough, 2003, p. 199). Recent studies of place-based leadership have focused on the role of leadership for territorial development (Beer & Clower, 2014; Collinge & Gibney, 2010b; Gibney, 2011; Stimson et al., 2009; Stough, 2003), as also the leadership dynamics for complex and adaptive challenges confronting regions in the knowledge era (Gibney, 2011; Uhl-Bien et al., 2007). Therefore, leadership for regional economic development is not based on traditional hierarchical relationships; rather is a collaborative relationship among institutional actors encompassing the public, private and community sectors based on mutual trust and cooperation (Stimson et al., 2002, p. 279).

Systemic leadership and S3

From a systemic perspective, place-based approaches take into consideration a variety of stakeholders and their relationships. As a place-based approach, S3 requires broad consensus among stakeholders from the triple helix and a shift from traditional top-down policies to bottom-up participatory governance reflected in the EDP (Aragunen et al., 2018). Similarly, leadership studies recognize the relevance of governance, in particular, collaborative governance for place leadership (Bentley et al., 2017). In fact, Sotarauta (2014) argues that some definitions of leadership from a systemic perspective, are closer to the concepts of ‘partnership’ and ‘governance’. Which on one hand stresses the importance of such concepts in leadership studies; but on the other, the importance to differentiate leadership from those concepts. In similar vein, Gianelle et al. (2016) consider that for a successful S3 process; leadership and participation are key principles of governance. Thus, although the studies on governance and leadership of S3 stress relational challenges when different actors enter a common environment, ‘leadership is exercised through governance process’ (Bentley et al., 2017, p. 198), becoming a process embedded in another process.
It is important to distinguish the process leaders from those who hold power positions (typically multinational enterprises (MNEs), large companies, government and some organizations), which may condition the S3 strategy by influencing it to protect particular interests. Consequently, the institutional context plays an important role in the S3 process (Rodríguez-Pose et al., 2014). Governments are expected to play a role in creating the institutional conditions under which leadership can emerge (Beer & Clower, 2014, p. 6), especially in regions where institutional settings are weak.

Sotarauta (2018), identifies five leadership traps for S3, taking a systemic perspective; first, conflict between institutions that are not well integrated; second, governance issues, especially related to centralization, as decentralized governments provide better prospects; third, a problem of capabilities in which less developed innovation systems tend to rely too much on external consultants with limited knowledge about the region; fourth, the mobilization trap, for which private actors are expected to contribute with important content for the strategy but the willingness to participate and foster regional development are not evident; and finally, the issue of a truly shared vision, where the author questions if this can be constructed and boost structural change.

The studies that analyse the role of leadership in S3 (e.g., Sotarauta, 2018; Aranguren et al., 2018) have focused on this systemic perspective. However, it is also important to consider that the existing institutional context and capabilities, including leadership, change over time. Moreover, a transformative strategy such as S3 requires considering an evolutionary perspective, for which leadership for change is also crucial.

**Leadership for change and S3: an evolutionary perspective of leadership**

Path dependency is a concept applied to the processes dependent on its own history (Valdaliso et al., 2014, p. 2), which emphasizes the importance of history and evolutionary trajectories of regions to develop new grow paths for both economic development and policymaking processes (Metcalfe, 1995). One goal of S3 is generating structural change in regions, a concept widely analysed in S3 studies (e.g., Květoň & Blažek, 2018; Morgan, 2013). The link between leadership and adaptability to changing environments that require ‘exploration, new discoveries, and adjustments’ (Uhl-Bien et al., 2007, p. 300) is related to the concept of dynamic capabilities,\(^1\) which is described as the regional ability to change competencies in a changing environment based on their trajectories (Teece et al., 1997). Bailey et al. (2010) describe ‘place-renewing leadership’ as a leadership that copes with path-breaking adjustments (p. 460); such leadership may be expected to take place during the EDP, the point of departure for transformation through S3, which assumes that entrepreneurial knowledge is dispersed among regional actors. The process is deemed entrepreneurial because the interactions amongst the triple helix ‘should be entrepreneurial and geared towards transformation of the economy’ (Aranguren et al., 2018, p. 1). Moreover, in some regions, new paths do not emerge spontaneously and require an entrepreneurial vision for transformation (Sotarauta, 2018); such entrepreneurial leadership is crucial to accomplish S3 objectives and path renewal. Morisson and Panetti (2020) stress the importance of institutional entrepreneurs for regional change, but also to foster the institutional changes required for renewal. On similar lines, Rodríguez-Pose et al. (2014) argues that institution-building can be a key factor to modernization of the economic structure. From a systemic perspective, the institutional environment settles the conditions for leadership to flourish. An evolutionary perspective also sheds light on a virtuous process where institutions and leadership impact each other. While institutions and institutional thickness impact may encourage or hamper leadership (Horlings et al., 2018; Stimson et al., 2009), some studies highlight the role of place leadership in creating a favourable institutional setting, wherein other processes like innovation can emerge (Beer & Clower, 2014; Horlings et al., 2018; Morisson & Panetti, 2020).
Leadership impacts on institutional arrangements, which also influence the learning and innovation processes (Horlings et al., 2018, p. 26), and reduces lock-in risk by fostering favourable institutions rather than moribund development paths. Regions unaccustomed to place-based practices also risk lock-in if the power dynamics among actors remain constant (Aranguren et al., 2018), to ‘end up amplifying path dependency instead of enhancing branching into new directions’ (Sotarauta, 2018, p. 199). Moreover, some case studies have shown that in regions with limited historical experience of radical forms of evolution, place-based policies such as S3 have been based on hard data in order to avoid rumours about picking winners, which ‘cements’ existing industrial paths rather than discovering new ones; dependency is also reinforced when new branches are underrepresented, as without sufficient evidence new specialization niches are not proposed (Květoň & Blažek, 2018). Thus, leadership becomes important in fostering institutional settings necessary for transformation (Bailey et al., 2010; Beer & Clower, 2014; Horlings et al., 2018) and also for learning from experience (Morgan, 2013, p. 104).

Governments are typically expected to create the conditions in which leadership can emerge (Beer & Clower, 2014, p. 6). However, ‘content leaders’, or those who have knowledge of specific fields (Aranguren et al., 2018) as well as other institutional entrepreneurs from the private sector (Morisson & Panetti, 2020), are expected to be the ones to envision the new paths to unknown destinations and become ‘transformational leaders’ (Sotarauta, 2005). Leadership for change, is understood in the context of place renewal, which implies empowering institutional or social forms of decision making to adjust to path-breaking economic change (Bailey et al., 2010, p. 462). Moreover, it includes not only economic changes but also changes in the way policy is designed. This leadership is place based and emerges from the region. Thus, a decentralized government is expected to promote such leadership and change (Horlings et al., 2018, p. 263).

**METHODOLOGY**

The analysis of the leadership in S3 is itself a qualitative concept (Beer & Clower, 2014), thus, a qualitative methodology was followed (Maxwell, 2009). In particular, multiple case studies (Yin, 2003) were selected to analyse the regional leadership capabilities for S3 in two regions with similar structural characteristics, but differences in softer aspects such as institutional arrangements and degree of decentralization for decision making, which are expected to shed light on common patterns (Patton, 1990). According to Yin (2009), multiple case studies increase the robustness of the methodology. In addition, for this exploratory study, in depth cases are more desirable than superficial synthesis of larger samples (Pawson et al., 2005; Suri, 2011).

In line with similar studies (i.e., Morisson & Doussineau, 2019), purposeful sampling was used for case selection, which refers to a careful sample selection according to relevant variables (Suri, 2011). The variables considered for this study are summarized in Table 1. The regions are in Latin America, where different countries have considered the S3 philosophy in their regional development agendas (Barroeta et al., 2017). The existence of studies of each region referring to the relevance of leadership supports the case selection.

The results from the cases analysed are place specific, therefore, the findings are not generalizable. However, they may be ‘transferred’ to similar contexts (Maxwell, 2009).

The selection of participants in each region was carried out differently from case selection, mainly following ‘snowball sampling’ to find information-rich cases (Patton, 1990). The researcher’s endeavour was to seek respondents who could shed light on the leadership dynamics of the S3 process; those interviewed individuals who participated at different governance levels were the object of analysis. The steps followed were: first, an informal conversation was held with the consultancy firms in charge of the S3 process to shed light on those key informants
to gather data on key aspects of the research question. Then, the researcher travelled to observe the reality of regions. Three main data collection instruments were used.

First, 33 semi-structured interviews collected between 2017 and 2018, which lasted an average of one hour. The interviewers were informed about the aims of the study before the interview and gave permission to record them after explaining that they would be anonymous and stored in a password-protected laptop, as well as destroyed after the purpose of the study was met. The interviews were transcribed, then analysed through categorization, grouping similar data and meanings into categories (Given, 2008). Then, the frequency of arguments was tabulated and analysed. The interviews were semi-structured around topics such as centralization and ownership, the importance of institutions, the leadership dynamics and motivation. The emergent topics were implemented in the following interviews to validate results. Because the interviews were performed in Spanish, the quotations reflected throughout the case studies have been translated by the author. Table 2 shows a relationship of the interviews classified according to the type of stakeholder and by region. Second, observation of the regional reality, for which the researcher travelled to each region for a couple of months; the reality factors observed included the culture, the sense of ownership, the satisfaction with public policy and plans, collaboration culture, implication of the citizens in regional matters and the entrepreneurial atmosphere. Thirdly, document analysis which included the results of the S3, published

| Similarities (hard/structural) | San Luis Potosí | Medellín |
|-------------------------------|----------------|---------|
| Inhabitants (2015)            | Large (2.58 million) | Large (2.46 million) |
| Type of region                | Intermediate metropolitan, centred in the capital | Intermediate metropolitan, centred in the capital |
| Economic activities           | Industrial | Industrial migrating to services |
| Existence of regional clusters on which S3 was based, 2018 | Automotive, logistics | Energy, fashion, tourism, construction, Information Technologies and Communication, creativity and entertainment |

| Differences (soft) | San Luis Potosí | Medellín |
|--------------------|----------------|---------|
| Type of previous strategies: specialization/diversification | Specialized, focused on automotive industry and related industries | Both. Analysing the region to choose the clusters on which to specialize |
| Approach to S3      | Centralized | Decentralized |
| Institutional environment | Organizationally thick but institutionally thin | Organizationally and institutionally thick |
| Leadership (expected) | Weak | Strong |

| Other data | San Luis Potosí | Medellín |
|------------|----------------|---------|
| Year of implementation S3 | 2014 and 2019\* | 2017 |
| Approach to S3 | Mandatory to all Mexican regions | Experimental in regions that decided to implement it |
| Studies of leadership and regional innovation policy that reinforce cases. | Solleiro et al. (2020) | Morisson and Doussineau (2019), Morisson and Panetti (2020) |

Note: \*The RIS3 from 2019 was conducted after the interviews; however, it was also considered for this paper because some studies shed light on the regional leadership challenges from both processes in 2014 and 2019.
and non-published working papers from the consultancy firms, other regional documents and previous academic studies.

The perceptions of the participants are not taken as evidence of the truth and are contrasted with other sources as both deductive and inductive methods for explanation building. According to Creswell (2009), qualitative research builds on patterns and categories from the bottom-up, working back and forth between the themes and the database until a comprehensive set of themes is developed inductively. However, deductions were also considered for those narratives of facts. The information was contrasted with previous research on the regions, document analysis and observations to strengthen data validity (Fossey et al., 2002).

The cases are structured as follows. First, a brief introduction to each region is made, then, the industrial trajectory and structure is mentioned as well as a description of the innovation policy organisms and the innovation policy paths followed, as well as elements that are considered important to understand the emergence of leadership dynamics. The rationale to implement S3 in each region is also explored in order to determine the degree of decentralization in the decision. The governance structure for S3 is also analysed to understand the formal leadership sources. Although in both cases the strategy is regional, both were centred in the metropolitan area reflecting the reality of such area, which is also mentioned. Finally, the leadership dynamics and the impacts they have for S3 including motivation and strategy ownership are induced.

Case studies

The case of San Luis Potosí (SLP)

SLP is a region favourably located in the Mexican Bajio area. By 2020, SLP had around 2.8 million inhabitants, of which 1 million were in the metropolitan area. SLP represents 2% of the country’s population and 2.1% of the national gross domestic product (GDP) (INEGI, 2021). The regional economy is mainly based on industrial plants, most of them foreign owned. The main economic activities are in the industrial sector, constituting 60% of the regional business units. The industrial activity again is concentrated in large firms, which represent only 0.2% of the industrial sector but account for 27% of employment and 40% of the regional income. As is common in large Latin American regions, 80% of the economic transactions are focused in the metropolitan area (SEDECO, 2021).

The industrial structure of the country has followed a similar path since the 1990s, when the North American Free Trade Agreement (NAFTA) was consolidated. Consequently, industrial policy has focused on attracting specialized foreign direct investment (FDI). In terms of innovation, the National Council for Science and Technology (CONACYT) is the central public organization in charge of science, technology and innovation (STI) policy, which reports directly to the nation’s president. Although a narrow perspective on science and technology

Table 2. Number of interviews according to the stakeholders’ classification.

|                              | San Luis Potosí | Medellin          |
|------------------------------|-----------------|-------------------|
| Firms and firm organizations: including public organizations in charge of firms and clusters | Total: 5 | Total: 5 |
|                              | Interviews 1–5 | Interviews 17–26 |
| Knowledge institutions and public organizations in charge of innovation-related issues | Total: 7 | Total: 3 |
|                              | Interviews 6–12 | Interviews 27–29 |
| Government and public organizations for economic growth | Total: 3 | Total: 3 |
|                              | Interviews 13–15 | Interviews 30–32 |
| Intermediary (consultancy)    | Total: 1 | Total: 1 |
|                              | Interview 16 | Interview 33 |
| Total number of interviews    | 16 | 17 |
policies had predominated for decades, the year 2008 marked a break from convention, when innovation was incorporated into CONACYT’s programmes. Mexico has a centralized mode of governance, although regional strategies are possible when aligned with and validated by the central offices. CONACYT has also launched instruments such as the fund for regional development (FORDECYT) and the mixed funds (FOMIX) co-financed by the national and regional layers.

After the experience of building an innovation agenda for Mexico, the Mexican government that took office in 2012 was interested in replicating the exercise in all the 32 Mexican states. At that point, the philosophy and methodology of S3 seemed appropriate to come up with innovation projects and strategic areas with a degree of place sensitivity. Therefore, CONACYT launched the state innovation agendas (SIAs) project (Solleiro-Rebolledo et al., 2020). ‘There were two requisites for the agendas: use S3 methodology and propose a particular project portfolio’ (interview 6). In the case of SLP, a foreign consultancy with subsidiaries in Mexico City oversaw SLP’s SIA. Following a sectoral prioritization logic, auto-parts, food industry and energy were selected, with their respective projects (CONACYT, 2014a, 2014b).

Although S3 was mandatory for all regions and selected at the national level, at the regional scale the Ministry of Economy was designated as the department in charge of S3, which followed the project mainly through the regional Science and Technology Council (COPOCYT). The Ministry of Economy and the consultancy firm constituted a management committee composed of three government institutions. Then, an advisory group was set up, including the directors of universities, public organizations and managers/owners of a few companies; this governance level was responsible for priority selection. Once the priorities were set, sectoral workshops were performed that defined the specific projects for the SIA.

The abovementioned challenge of economic concentration in the metropolitan area led to an exclusion of municipalities and areas away from such area; thus, the COPOCYT decided to implement S3 at the regional level in 2019, which was more STI centred than the first approximation. Solleiro-Rebolledo et al. (2020) highlight some challenges faced by the region through the experience of the second exercise: first, the leadership challenges to build a consensus; second, the institutional and governance constraints; third, the difficulty in creating a shared vision around concepts that were not clear or common to participants; and fourth, lack of participation of key actors from both business and universities. This happened due to institutional aspects such as low credibility, unawareness of the importance of the participation and vested interests prevailing. Moreover, key actors from the faculties were missing because ‘they did not assume the project as theirs’ (p. 104).

The interviewees similarly identified challenges related to the innovation capabilities and industrial structure, but also leadership-related challenges. The most important challenge was probably the lack of ownership of the project; although the ministry in charge of the follow-up of the strategy was identified, the centralization of the decision to adopt S3 in national authorities and the fact that different organizations were made responsible for reporting to the national authorities bred the perception that ‘nobody felt as the owner of the process’ (interview 14), which provoked criticism of the process. Without clear regional leadership, the consultancy firm played a more active role in building a vision from different and contrasting arguments (interview 16), which evoked criticism regarding a focus on methodology and the deliverable document instead of understanding the region (interviews 2 and 7). Another challenge was poor participation micro- and small enterprises barely participated (CONACYT, 2014a, 2014b); being pressed for time and without understanding of the topic (interview 1). Additionally, there was a lack of trust in government actions, especially among those who had participated earlier in such processes, without results.

After the call for participants, one challenge with participation was that some abandoned the process when they realized the time involved, unclear financial resources for their interests and
disagreement with the priority selection. On the other hand, many individuals who did participate could not engage with the process and sent their representatives to the meetings, which included the organizations with members from all three helixes. In fact, almost half of the interviewees declared participation as being from low to moderate. For those who participated, building a shared vision was also challenging because of vested interests; the interviews show that there were power conflicts and strategic alliances to gain power among participants (interviews 2 and 8), and that conservative forces resisted the change (interview 11), defending the status quo and criticizing the result for being ‘obvious’ (interview 7). In that difficult environment, there was criticism about the chosen priorities, that ‘the mode seemed more important than the mean’ (interview 8) and that opinion leaders’ perceptions were taken into account rather than facts and expertise (interview 13). Also, the lack of participation and degree of rotation raised the perception that priorities were set by those who attended more meetings, rather than by those who knew, and because opinion leaders were not innovation experts the strategy took a productivity and economic bias instead of focusing on research and development (R&D) and innovation (interviews 6, 8 and 9).

Overall, a quarter of participants pointed to lack of leadership as the main challenge (interviews 8, 10, 11 and 14), especially in a region with mistrust and where participatory policies are new (Solleiro-Rebolledo et al., 2020). Moreover, the challenge from traditional forces to performing a real ‘discovery’ was strong, and the entire institutional environment led to results that were not really followed up, once the SLP SIA was delivered. This aligns with Barroeta et al.’s (2017) observation that the weakness of S3 in Mexico has to do with the formation of a shared vision (p. 35).

**The case of Medellín**

Medellín is the second largest city of Colombia, located in the Alburra (Antioquia). The economy of Medellín was boosted in the 19th century after it was designated the capital of Antioquia. By 2018, the city had a total population of over 2.3 million inhabitants, which rises to over 4 million if the whole metropolitan area is considered (DANE, 2019). In the early decades of the 20th century the region became one of the largest industrial cities in Latin America. However, growth of the city dropped dramatically by the end of the century when an increase in cocaine trade led to political and social instability as well as violence and extortions suffered especially by businesses (Maclean, 2014).

Narcotrafic seemed the only solution for those unemployed citizens. By the 1980s, the city was known as the most violent in the world. Despite the death of the leader of the Medellín Cartel in 1993, the problem continued until the early 2000s when the Major Sergio Fajardo was elected, supported by the middle-class and business organizations such as the Business Group of Antioquia (GEA) and Proantioquia. The public strategy was based on structural reforms in social urbanism and infrastructure as well as programmes to promote education, innovation and entrepreneurship (Morisson & Doussineau, 2019, p. 109). The region experienced an industrial transformation; first, from low-value-added primary activities to sophisticated secondary industries and then from the industrial focus to a service-oriented economy.

The economic policy of Medellín has transformed in recent decades, following academic theories especially about clusters (Porter, 1998) and self-discovery (Hausmann & Rodrik, 2003). The Chamber of Commerce of Medellín for Antioquia (CCMA), which belongs to GEA, has been at the helm of such changes together with the town hall. In 2006, both institutions led an important cluster strategy that marked a growth period. The cluster specialization strategy was guided by economists such as Ricardo Hausmann and Dani Rodrik. In 2009, the private–public organization Ruta N was established with the goal of promoting entrepreneurship and the transition towards a knowledge-based economy. By 2011, Ruta N, in collaboration with private and public organizations, defined three specialization areas for the region: health,
energy and information and communication technologies (ICTs), stressing the orientation towards services. The innovation system of Medellín has evolved, engendering institutional thickness, creating several organizations and building trust among stakeholders.

The STI policy is coordinated at the national level by the National Planning Department (NDP), with Colciencias as a key player that operates as science ministry, research council and innovation agency (Organisation for Economic Co-operation and Development (OECD), 2020). However, the strong regionalized nature of the region leads to regional policy efforts. In 2016, CCMA considered that the decade old cluster strategy needed renewal and found S3 methodology valuable to find the new economic wave from bottom-up, which was a logical step according to the previous trajectory of the region. CCMA presented the idea to the major, together with a reference of positive experiences in implementing S3 in Bogota. Therefore, the strategy was co-financed by the government and the private sector, represented by CCMA. Clearly, having the major head the project would enable the process to acquire the formality, engagement and mobilization required for S3. Admittedly, the government could convey their confidence powerfully due to positive experiences in participatory initiatives and with reforms based on academic propositions. However, the structure of CCMA and its clusters reached a high number of interested participants, which admittedly exceeded expectations. The participants included micro and SMEs, which constitute most regional business units, who also lauded CCMA’s efforts: ‘Whenever they [CCMA] detected that someone missed a meeting, they would call to understand why and give them update’ (interview 19). For those who did not participate, especially entrepreneurs, their needs were exposed by Ruta N. Despite time constraints for the business sector, the high response rate was also a consequence of the regional culture, with a strong sense of belonging (interview 33) that characterizes people from Medellín (paisas), which ‘is genetical’ (interview 17; Morisson & Panetti, 2020). Consequently, it was stressed in 11 of the interviews as explaining the enthusiastic participation.

The consultancy firm in charge of the process had subsidiary offices in Medellín, which meant that local consultants with knowledge about the region were participating. The consultancy carefully selected key informants to interview before the process began, to gain insights and higher place sensitivity. From such interviews it became clear that the objective was not to replicate the S3 from Europe, for two main reasons: first, the lack of resources for innovation and technology and that they were lower than the structure and amount of ERDF funds from the European Commission; and second, the lack of business and science and research capabilities to focus STI (emphasized in interviews 21 and 22). Thus, the idea was to execute a customized exercise focused on finding those activities or dynamic areas that would foster higher productivity and economic growth in the region. Some of the interviewees suggested that more precise nomenclature such as ‘productive specialization’ (interview 24) or ‘specialized productivity and competitiveness’ (interview 25) helped customize the strategy.

The governance structure defined for S3 placed at the top formal regional leaders such as the Major and the directors of the main regional organizations. However, the thematic workshops included more operational actors such as faculty members and university researchers or entrepreneurs in specific fields. Different committed stakeholders were able to straighten out the process whenever it was perceived to replicate other models, instead of reflecting the conversations from the regional reality.

Despite previous experience with participatory policies, the novelty was on the careful selection of a greater number of participants than in previous experiences. Unfortunately, the last stage of the process received criticism for being too general; interviewees often used the analogy ‘a train could fit in.’ The broad areas are advanced medicine and wellbeing, green and sustainable territory, smart region, sustainable and inclusive industry and the transversal area of the entrepreneurial region.
The challenges for Medellín’s S3 process included the difficulty of setting priorities in a complex regional setting and the inclusion of actors from marginal areas, which led to criticism of a Medellín-centred strategy (emphasized in interviews 17 and 30). What was considered positive was Medellín’s ability to follow a trajectory of renewal and change, the appropriation of the strategy by all governance levels and from the different helixes as well as the institutional structure as a strong point of departure. Although clusters played an important role, the process reflected results different to the clusters that were already established through the analysis of hard data. This was the first time a diverse and numerous groups of actors were participating in a public policy initiative, and most of them were satisfied with the process, from the call to the deliverables.

To summarize this section, Table 3 compares the results in both case studies around different factors analysed.

DISCUSSION

The discussion in this paper emerges from a growing interest in the role of leadership for territorial development (Beer & Clower, 2014; Collinge et al., 2010; Gibney et al., 2009; Stimson et al., 2009; Stough, 2003). The case studies shed light on two main factors that can either foster or hinder leadership in the process of S3.

The first factor is the degree of centralization. Regions with decision making authority tend to have a higher scope for leadership and leadership styles (Beer & Clower, 2014), and promote effective leadership which may reduce the tendency of concentration on metropolitan areas (Bentley et al., 2017). Moreover, leadership is more challenging in centralized governments, and risks the customization of policies, which may result in imposition of solutions that are not place sensitive (Beer & Clower, 2014; Bentley et al., 2017). This negatively impacts the emergence of the evolutionary approach of leadership for change in local communities (Horlings et al., 2018, p. 263). However, strong leadership is also possible in centralized governance systems. Both case studies depend on national governments for funds, and their policies must align with national development plans. However, the reflection process to implement S3 was imposed in SLP, whereas in Medellín regional actors found it suitable for the region. This degree of appropriation impacted in participants’ motivation. The impact of centralization on motivation in collaborative processes such as S3 has also been recently studied in the context of cross-border collaborations (Hegyi et al., 2020), strengthening the argument for the importance of decentralization to foster participation in place-based policies.

The second factor is the institutional context, including both informal and formal institutions. From a systemic perspective, some case studies have revealed the importance of trust for a shared leadership process (e.g., Aranguren et al., 2018, p. 8). Institutions impact both formal and political leadership, but also the informal and emergent leadership taking place during the process (Collinge et al., 2010). In SLP, both favourable institutions and leadership capabilities are limited due to mistrust and negative past experiences in participatory approaches, where vested interests and lock-in were present, breeding a ‘more of the same’ cycle. In Medellín, though, after initial mistrust and violence, private sector leaders such as CCMA have brought together private actors and collaborated with other helixes, fostering institutional capabilities. Therefore, the shared leadership experienced in Medellín started within individual public organizations, that became regional leaders and helped strengthen the regional institutional environment. With stronger institutions, emergent leadership took place from different organizations. In other words, leadership generates stronger institutions; and stronger institutions allow leadership to take place. This observation strengthens the importance of an evolutionary perspective for place-leadership research.
| Topic         | **San Luis Potosí**                                                                                                                                                                                                 | **Medellín**                                                                                                                                                                                                                   |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Institutionalization** | Several actors (organizational institutions) have similar functions but different or even contrasting perspectives, demonstrating a lack of coordination at a system level. Weak informal institutions: mistrust in the government, weak linkages. Vested interests ‘some left when their sector was not reflected as a priority’. | Several actors (organizational institutions), emergent public–private actors. Strong informal institutions: trust in the government and the ways in which the city has been run in the last decades. Disappointment from business and organizations in sectors not reflected, but kept participating. |
| **Centralization** | Predefined by the government and validated by participants. ‘Nobody owned the process’. | Regional institution decided to implement the strategy. Perceived as accurate for the region. |
| **Call for participants** | Poor participation. Main motivation: accomplish a duty. Companies argued there were too many reunions and a lack of time. The actors from the same organizations were rotating, which diffculted a continuity. | High participation. Main motivation: need for change. Institutions to speak on behalf of those that could not participate. The same actors that represented specific organizations were committed to the strategy. |
| **Shared leadership** | Formal leadership from government actors that needed to deliver results. Consultancy firm took the leadership role due to a lack of regional leadership. | Different leader institutions in a shared leadership environment despite some confrontations. Emergent leadership from different regional actors. Academic experts that lead new trending topics have participated in defining the vocation of the city. |
| **Novelty management** | ‘Conservative forces hinder change and new ways of doing things’. Embrace new theories and tried to involve different stakeholders but the degree of participation and commitment was low. S3 was confused with a regional development strategy from the beginning and tried to focus on innovation projects at the end. Participants complained about the number of meetings with a highly academic content which was difficult to follow by non-academics. | The region has experienced different way of structuring their region and prioritization. It has also diffused the concepts of competitiveness and innovation. S3 was confused with a regional development strategy and lost the innovation focus through the process. Participants from business complained about the number of meetings with a highly academic content which was difficult to follow by non-academics. |
| **Path-breaking** | ‘More of the same’. The city has experienced a lock-in since the entry in international global value chains, which define the regional strategy. | Medellín has experienced structural changes recently. An example of path-breaking and public innovation. |

*Table 3. Summary of results from case studies.*
The case studies reflect different leadership styles. Although the sources of leadership vary among regions (Aranguren et al., 2015), various studies have highlighted different types of leaders in territories (Beer & Clower, 2014; Collinge & Gibney, 2010b; Uhl-Bien et al., 2007), and specifically for S3 (Aranguren et al., 2015). In general terms, there is a distinction between formal leaders, typically the government, which wields power especially in the early stages. Medellín is a striking example of a region that understood the importance of such leadership, and engaged government in S3 early on. Second, there is a leadership role for those in charge of S3 process who interpret the regional vision from the interactions and conversations; that role is typically played by a consultancy firm, which can be argued to limit the scope for place-based policies. Finally, leaders in each field with specific knowledge are the ones expected to envision future opportunities for the region in a more transformative way. Aranguren et al. (2015) call them content leaders. In Medellín, content leaders attended most of the meetings, especially in the final stages where concrete opportunities were defined. In SLP, as Solleiro-Rebolledo et al. (2020) noted, important content actors were missing, and instead those with influence, supposedly opinion leaders, defined opportunities, which begot what the interviews defined as ‘obvious results,’ and the literature as lock-in. Although the latter type of leaders may drive the region to unknown opportunities, there is another form of leadership which is more spontaneous, also recognized in the literature, in which ‘it is difficult to say a priori who will take a leadership position’ (Sotarauta, 2014, p. 30), because it is not directly related to influence, being based rather on a ‘sense of need’ (Beer & Clower, 2014, p. 7) and defined as an emergent and dynamic process as a result of adaptation (Uhl-Bien et al., 2007). Such informal leadership fosters a shared development vision (Horlings et al., 2018) due to an entrepreneurial nature, which strengthens the EDP. In the case of Medellín, informal leaders were in the private sector, especially CCMA, Ruta N and other private stakeholders, which actually oriented the consultancy when the process was perceived as missing place sensitivity. In SLP leadership was undefined, even formal leadership was not assumed, and the consultant needed to be more proactive in defining a vision for the region due to the deadlines established for the project, a fact reflected negatively in the interviews. The SLP case strengthens Beer and Clower’s (2014) argument, that poor leadership is less risky than none at all.

Leadership capabilities in regions are place specific (Aranguren et al., 2015; Beer & Clower, 2014); still, attempts were made to identify general capabilities for place leadership (e.g., Sotarauta, 2005). On similar lines, the analysed case studies shed light on leadership capabilities for S3, reckoning both systematic and evolutionary dimensions, each with two specific capabilities. For the former it was the capability to foster participation and commitment, and to build a shared vision, whereas for the latter it was managing novelty and the capability for path-breaking.

**Leadership to foster participation and commitment**

This capability refers to being able to select the right individuals from the triple helix, inviting through a clear methodology (Martínez-López & Palazuelos-Martínez, 2019), fostering their...
participation and maintaining interest in S3 during the process. Moreover, Gibney et al. (2009) are concerned with the importance of the engagement of local actors for place leadership, so that they can both contribute to and benefit from the outcomes. A common problem reflected in the case studies is underrepresentation of minorities, such as entrepreneurs and new branchers, a phenomenon similar to that perceived in Central and Eastern Europe (CEE) economies (Květoň & Blažek, 2018). In Medellín, this bias was mitigated by RUTA N, representing Medellín’s innovative start-ups of, but in SLP the misrepresentation was evident.

The capacity to foster participation and commitment shapes the S3, because the process is generated by a pull of individuals with different degrees of commitment to economic development. In SLP, the lack of a leader with conveyance power was perceived as the main problem with S3 (Solleiro-Rebolledo et al., 2020). The main motivations to participate were two: first, gain political power through the presence in regional matters; and second, comply a mandate from superiors. Therefore, the region experienced a lack of commitment to the objectives of the strategy. In addition, public bodies in charge of leading S3 did not appropriate the process. On the contrary, in Medellín, CCMA placed the government at the head of the process, to ensure formality and engagement.6 Then, made an open call to the innovation system stakeholders which had a great response and high degree of commitment throughout the process. A great involvement of the triple helix from the initial phase of S3 reduced the possibility of capability failures (Lee, 2017, p. 217) provoked by missing knowledge sources.

Leadership to build a shared vision

The combination of actors with different backgrounds and interests requires leadership to balance the conflicts and find commonalities. According to Horlings et al. (2018), leadership skills for places include formal and informal communication, building trust, perseverance, role flexibility and the ability to connect different worlds and logic (p. 251). The case studies show that although in both regions public organizations had a representative weight within the strategy, the consolidation of Medellín as an innovation system supported by numerous institutions led to more favourable results and experiences than those from SLP, which has a fragmented system. A shared vision is challenging in vertical strategies where prioritization implies exclusion. In SLP, strong actors from MNEs used their power to persuade authorities to support their sector. Just the opposite happened in Medellín, where the end of the prioritization process was criticized for being too broad to avoid exclusion. In both regions, the organizations belonging to non-priority domains were unsatisfied with S3 results. Another challenge for a shared vision is to build it around common understanding of concepts. For S3, the innovation concept was understood in different ways for the stakeholders in SLP, which led to a lack of innovation-oriented policy. In Medellín, earlier efforts to diffuse innovation concepts led to a similar language in the meetings. Finally, vested interests also affect S3; in SLP, vested interests hampered the construction of a shared vision, whereas stakeholders in Medellín were able to protect the regional interests.

Leadership to manage novelty

In S3, the notion of a policy running ahead of theory (Foray, 2012), and the novelty of concepts and of policy practices, have led to conceptual, operational and political challenges (Morgan, 2013). Probably the most intractable novelty is the new role of government as facilitator (Foray et al., 2009), which means a capacity in leadership to shift from a planning style of policymaking to an EDP (Aranguren et al., 2015). However, the public policy process follows an inherent path dependency (Metcalfe, 1995), even in those regions with experience of bottom-up practices. The case studies show that in SLP S3 was the first participatory approach involving the different helix stakeholders; a fact that was perceived as positive and as a first step to improve policy design. As a new strategy, the regional actors relied more on the
experiences from the consultancy firm. In Medellín, the institutional structure and previous experiences defining regional specialization enabled regional stakeholders to work together with the consultancy, complementing their knowledge about the strategy with the knowledge about the region. Therefore, the strategy reflected the reality of Medellín.

**Leadership for path-breaking**

Although place-based policies are path dependent, the learning capability allows breaking with the past (Horlings et al., 2018; Morgan, 2016). In less advanced regions, the pressures to objectively justify priority selection lead to the use of hard data for evidence-based decisions, leading to the existing priorities (Květoň & Blažek, 2018).

The 20-year transition of Medellín from the most violent to the most innovative city, reflects the regional capability to break with the past. In addition, the embrace of new growth theories to define the cluster strategies and prioritization domains generated important structural changes. S3, has been perceived by most participants as the ‘evolution of the cluster policy,’ however, leading actors have explained that the strategy is expected to be another breakthrough for the innovation policy of the region. The experience of SLP was different, because ‘conservative forces participated’ (interview 8). Those forces are pre-existing regional leaders and leading sectors, which is a ‘fundamental hindrance to embarking upon radical pathways’ (Květoň & Blažek, 2018, p. 13).

Summarizing, S3 is a new approach that has settled a new forum for discussion, new vocabulary and, as reminded by Sotarauta (2014, p. 30), it constitutes a first step in a formal planning procedure. Actually, as experienced by other regions in Europe (Kroll, 2015), the main contribution of the S3 process in the studied regions lies in new routines and practices and a new vocabulary.

**CONCLUSIONS**

This paper combines two bodies of literature that have raised the interest of researchers in the last decade: territorial leadership and S3. Moreover, it takes less advantaged regions as point of departure to find those challenges related to leadership that are typically extrapolated to more advanced regions.

This study argues that leadership for S3 should have both a systemic and evolutionary perspectives oriented towards change. The former includes capabilities such as the capacity to foster participation and commitment as well as the ability to build a shared vision. The latter includes the capability to manage novelty and to strike a path forward, avoiding lock-in risks.

The centralization of the decision to implement the strategy is related to the degree of appropriation; therefore, imposition of S3 from higher governance layers reduces the degree of engagement and the possibility of emergent leadership. On the contrary, when regional actors participate on the strategy definition and adaptation to the regional characteristics, the participation rate raises as well as shared leadership.

Institutions are another factor that enables or hinder participation and commitment to regional development. Thus, previous experiences with public policy, and in particular place-based policies, shapes the capability to deal with different type of stakeholders and to extract valuable information from interactions. In addition, regional actors are more willing to participate in regions where previous experiences have been positive.

A positive S3 process depends on the regional leadership capabilities. In regions with weak or absent leadership capabilities external actors, such as the consultancy firm, may take a leadership position which hinders the possibility for a bottom-up discovery.

An environment for emergent leadership is desirable, however, formal leadership from public authorities is important for continuity and formality of the process. Therefore, it is important
for S3, that formal leaders focus on the strategy objective: structural changes through innovation domains that reflect the regional reality from the bottom-up. For that objective, leadership for change is as necessary as systemic leadership.

Some limitations of this paper must be highlighted. First, the subjectivity of the selected method (case studies) which has less rigour comparing to other qualitative methods. The use of combined methodologies (mixed methods) would be desirable for less exploratory studies. In addition, the selection of interviewees through snowball sampling may bias the research towards groups of like-minded individuals; although the consultancy firms played an important role providing information about the key informants that were interviewed at first, the limitation is acknowledged. Furthermore, contrasting case studies shed light on common patterns and differences in results, a larger sample would enrich future studies, which would allow to find common patterns between the different helixes.

Although this study has an exploratory character, it sheds light on future research avenues such as the role of external consultancy firms enabling an environment for emergent leadership and the incorporation of the evolutionary perspective in place-based leadership.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

NOTES

1 Leadership is actually considered one of the important dynamic capabilities for territories (Aranguren & Larrea, 2015; Harmaakorpi, 2006).
2 Especially since the OECD (2009) criticized that regional innovation policies should target the particular issues faced by each region considering their differences.
3 This issue could be observed from the interviews, but also matches the arguments by Solleiro-Rebolledo et al. (2020) regarding the mistrust on the government due to negative past experiences.
4 For instance, the Metro of Medellin together with the ‘metro culture’ programme connected the city, including the areas that were difficult to reach due to the orography of the valley, and for which the city has received public innovation awards. The Comuna 13 project also represents the philosophy of renewal, in which the lifestyles of inhabitants improved significantly, and the local community was offered new working opportunities other than drug-dealing and violence.
5 With special focus on medicine due to the increasing fame of organ transplants.
6 Previous experiences with government-led strategies had been positive.

ORCID

Iga César http://orcid.org/0000-0002-5411-3989

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