

Article

Inter-municipal governance networks: application of exponential random graph models in Los Lagos, Chile

Karina Retamal-Soto ¹Karina Arias-Yurisch ²Camila Ramos-Fuenzalida ³¹ Universidad Alberto Hurtado / Departamento de Política y Gobierno, Santiago – Chile² Universidad de Santiago de Chile / Departamento Gestión y Políticas Públicas, Santiago – Chile³ University of Birmingham / Institute of Local Government Studies, Birmingham – United Kingdom


The idea of governance has permeated the debates on the state's transformation at the regional level since the 1990s. However, operationalization difficulties have limited our knowledge of the phenomenon. This article contributes to filling this gap by examining the inter-jurisdictional dimension of regional governance. From a network perspective, the article studies the emergence of inter-municipal networks from different local collaborative mechanisms. Based on the institutional collective action framework, the study analyzes the prevalence of network structures associated with different types of social capital (bonding/bridging) in three inter-municipal networks in the Los Lagos Region in Chile. The application of exponential random graph models (ERGM) revealed evidence supporting the consistent prevalence of bonding in the three networks studied. The findings also showed the networks' coexistence with structures decentralized in more complex regional networks.

Keywords: regional governance; intermunicipal cooperation; bonding capital; bridging capital; institutional collective action framework.

Redes de governança intermunicipal: aplicação de modelos de gráficos aleatórios exponenciais em Los Lagos, Chile


Desde a década de noventa, a ideia de governança permeou os debates sobre a transformação do Estado no âmbito regional, não obstante, as dificuldades de sua operacionalização têm limitado nosso conhecimento. Este artigo busca contribuir para essa lacuna, examinando a dimensão interjurisdicional da governança regional. Aplicando a perspectiva da análise de redes, estuda-se a formação de redes intermunicipais que se configuram a partir de diferentes mecanismos de colaboração. Com base no marco institucional da ação coletiva, o artigo analisa a prevalência de estruturas de relacionamento associadas a diferentes tipos de capital social (*bonding/bridging*) em três redes intermunicipais da região de Los Lagos, no Chile. Através da aplicação de modelos de gráficos aleatórios exponenciais (ERGM), obtêm-se evidências que suportam a prevalência consistente de *bonding* nas três redes estudadas e sua coexistência com estruturas descentralizadas em redes de maior complexidade regional.

Palavras-chave: governança regional; cooperação intermunicipal; *bonding* capital; *bridging* capital; marco de ação coletiva institucional.

DOI: <http://dx.doi.org/10.1590/0034-761220220271x>ISSN: 1982-3134 

Article received on August 27, 2022 and accepted on February 27, 2023.

[Translated version] Note: All quotes in English translated by this article's translator.

Editor-in-chief:Alketa Peci (Fundação Getulio Vargas, Rio de Janeiro / RJ – Brazil) **Associate editor:**Mauricio Dussauge Laguna (Centro de Investigación y Docencia Económicas, Ciudad de México – México) **Reviewers:**Gustavo Leonardo Simão (Universidade Federal do Espírito Santo, Vitória / ES – Brazil) 

Two of the reviewers did not authorize the disclosure of their identities.

Peer review report: the peer review report is available at this [URL](#).

Redes de gobernanza intermunicipal: aplicación de modelos de grafos aleatorios exponenciales en la región de Los Lagos, Chile

Desde los noventa, la idea de gobernanza ha permeado los debates acerca de la transformación del Estado a escala regional, sin embargo, las dificultades de su operacionalización han limitado nuestro conocimiento. Este artículo busca contribuir con esta brecha, examinando la dimensión interjurisdiccional de la gobernanza regional. Aplicando la perspectiva de análisis de redes, se estudia la formación de las redes intermunicipales que se configuran a partir de diferentes mecanismos de colaboración. Con base en el marco de acción colectiva institucional, el artículo analiza la prevalencia de estructuras de relacionamiento asociadas a diferentes tipos de capital social (*bonding* – capital social vínculo – y *bridging* – capital social puente –) en tres redes intermunicipales de la región de Los Lagos, en Chile. Por medio de la aplicación de modelos de grafos aleatorios exponenciales (ERGM), se obtiene evidencia para sustentar la consistente prevalencia de *bonding* en las tres redes estudiadas y su coexistencia con estructuras descentralizadas en las redes de mayor complejidad regional.

Palabras clave: gobernanza regional; cooperación intermunicipal; *bonding* capital; *bridging* capital; acción colectiva institucional.

ACKNOWLEDGMENTS

The authors would like to thank Valentina Toledo Lizama (public administration student at the Universidad Austral de Chile) for her contribution to the data collection process. They also thank the three anonymous reviewers for their valuable suggestions for improving the manuscript.

FINANCING

This research was supported by Chile's Agencia Nacional de Investigación y Desarrollo (ANID), FONDECYT Iniciación Program N°11220121.

1. INTRODUCTION

Many of the public problems of the twenty-first century are characterized by their complexity and, because they are dynamic and multi-causal, cannot be dealt with in a fragmented manner by isolated organizations. Public action has, therefore, begun to be organized under collaborative governance models (Ansell & Gash, 2007; Osborne, 2010) that recognize the interdependence of actors from different sectors and levels of government in solving social problems.

At the subnational level, collaborative governance models have permeated debates about the transformation of the state (Kübler & Heinelt, 2004; Savitch & Vogel, 2000). The decentralization and privatization processes of recent decades have accentuated institutional fragmentation. In this context, the importance of the interdependence of territorial actors for the appropriate management of regional development has become evident.

Regional governance emphasizes collaborative approaches to problem-solving from multi-jurisdictional and cross-sector standpoints and is built using different, simultaneous mechanisms of collaboration based on the logic of voluntariness among the participants (Foster & Barnes, 2012; Kübler & Heinelt, 2004; Savitch & Vogel, 2000). Although these conceptual elements have helped to understand the phenomenon, empirical analyses that operationalize the complexity of subnational governance are scarce (Fürst, 2003; Willi, Pütz, & Müller, 2018).

This article seeks to contribute to narrowing this research gap by examining the horizontal, inter-jurisdictional dimension of regional governance. At the subnational level, inter-municipal

collaboration is crucial because local actors and their interactions have the capacity to facilitate or block initiatives, determining the quality of the implementation and coordination of regional development strategies and public policies (Miller, Nelles, Dougherty, & Rickabaugh, 2019; Nelles, 2012; Silva, Teles, & Ferreira, 2018; Tomàs, 2020). Consequently, a contextualized analysis of regional governance and its potential for collective action requires an understanding of collaboration between municipal actors and its dynamics of operation (Kim, 2020; Kantor, Lefèvre, Saito, Savitch, & Thornley, 2012).

To understand the inter-municipal phenomenon, this article adopts a network analysis approach. The research strategy of this analytical approach involves examining the structure of relationships on the assumption that patterns of relationships, not the isolated action of the actors, permit a better understanding of the social dynamics (Borgatti, Everett, & Johnson, 2018; Wasserman & Faust, 1994). Following these premises, the article examines collaborative governance networks in their inter-municipal dimension, analyzing the structures that shape them and the social processes that underpin their formation.

Based on the theory of institutional collective action (ICA) (Feiock, 2013; Kim et al., 2022), the article argues that the structure of relationships will reflect the actors' efforts to maximize the benefits of collaboration and reduce its costs and risks (Kim et al., 2022). By virtue of this, ICA establishes that the actors can generate different types of social capital, creating different relationship structures (Berardo, 2014). In line with this and considering the contributions that relate the theory of social capital and network analysis (Granovetter, 1973, 2000; Lin, 2012), ICA distinguishes between bonding social capital and bridging social capital as two types of social capital associated with specific network structures.

Considering this distinction, the article's central objective is to explain the relationship structures that prevail and shape inter-municipal governance. To this end, it takes the case of the Los Lagos Region of Chile. This is an attractive case study because it is a region in a unitary country that has experienced a political-administrative reconfiguration that has strained the formation of inter-municipal networks. Although an important part of the empirical literature has suggested that inter-municipal collaboration is natural in federal contexts and exclusive to them, the evidence is that this phenomenon has proliferated in unitary countries despite their less decentralized nature (Groenleer & Hendriks, 2020; Teles, 2016; Zambrano-Gutierrez & Avellaneda, 2022). Consequently, analysis of the dynamics of operation of inter-municipal networks in a unitary and centralized country like Chile has the potential to contribute to knowledge about the phenomenon and broaden the theoretical debate about the impact of institutional design on inter-municipal governance (Meza, Grin, Fernandes, & Abrucio, 2019).

In the case of the Los Lagos Region, we analyze the inter-municipal networks that are configured through the different collaborative mechanisms available under the country's legislation: collaboration agreements and municipal associations. Based on these mechanisms, the paper article asks the following questions: What relationship structures prevail in the region's inter-municipal networks? How, if at all, do the relationship structures vary depending on the particular mechanism of collaboration? To determine the prevalence of different relationship structures, exponential random graph models (ERGMs) are constructed for each of the networks.

The remainder of the article comprises four sections. The first presents the theoretical foundations that support the study's hypotheses. The case, methods, and research results are then described. The implications and limitations are addressed in the discussion and, finally, the conclusions are presented.

2. INTER-MUNICIPAL COLLABORATION THROUGH INSTITUTIONAL COLLECTIVE ACTION

In the framework of regional governance, inter-municipal collaboration networks reflect the voluntary participation of local governments in solving a common problem or jointly providing a service (Arias-Yurisch, Retamal-Soto, & Ramos-Fuenzalida, 2019; Teles, 2016). In a regional context characterized by institutional fragmentation and the interdependence of public problems, the decisions of one local government inevitably affect the performance of other jurisdictions, so this inter-municipal collaboration emerges as a solution to dilemmas of institutional collective action (Feiock, 2013; Kim et al., 2022; Mazzalay, 2015).

One body of theory that has contributed to explaining the dynamics of the formation of inter-municipal collaboration is the institutional collective action (ICA) framework. It has been widely applied in the United States (Feiock & Scholz, 2010), Europe (Tavares & Feiock, 2018), and, more recently, Latin America (Ramírez-de-la-Cruz, 2012; Meza et al., 2019). The theoretical propositions of ICA share the premise that the actors have bounded rationality and, in their collaboration decisions, apply criteria that seek to maximize benefits and reduce transaction costs and collaboration risks (Kim et al., 2022).

In the reduction of risks and costs, ICA emphasizes the role of social capital as a critical resource in the strategic definition of collaborative ties. Social capital consists of the actual or potential resources embedded in social relationships that can be mobilized when the actors want to increase the intended action's probability of success (Bourdieu, 1980; Coleman, 1990; Putnam, 1993). Higher levels of social capital facilitate the creation of trust, mutual benefit, and the credibility of relationships, which, in turn, reduce the risks and costs of collaboration (Scholz & Lubell, 1998).

Network analysis has related different types of social capital to specific relationship structures (Granovetter, 1973, 2000; Lin, 2017) and the literature has distinguished mainly between bonding and bridging social capital (Berardo, 2014; Nohrstedt, 2018; Tao & Zhang, 2020; Yeo, 2018). The former is characterized by the creation of cohesive connections with a closed group of partners with whom there are a large number of ties while the latter is characterized by the creation of ties that build bridges beyond the close and known group.

ICA adopts this distinction arguing that the relationship between types of social capital and network structure is mediated by the risks and costs that the actors face in collective action situations (Andrew, Arlikatti, Siebeneck, Pongponrat, & Jaikampan, 2016; Jung, Song, & Feiock, 2017). In this context, bonding is considered to reduce the risks associated with non-compliance with agreements and bridging to facilitate access to different resources that maximize the benefits of collaboration.

3. RELATIONSHIP STRUCTURE HYPOTHESES

Following Arias-Yurisch, Retamal-Soto, and Ramos-Fuenzalida (2022), this article understands relationship structures as complex phenomena in which different social processes converge: an endogenous or self-organized process (Contractor, Wasserman, & Faust, 2006) and an exogenous process centered on the attributes of the actors in the relationship (Desmarais & Cranmer 2012; Lubell, Scholz, Berardo, & Robins, 2012). Based on this definition, the bonding and bridging hypotheses are presented below.

3.1 Bonding hypothesis

The endogenous dimension of bonding refers to the tendency to transitive grouping under which actors who share links with the same other actors tend to form ties among themselves in a “the friends of my friends are my friends” logic (Tao & Zhang, 2020). This dimension of bonding evokes a closed, dense network structure that resembles a triangle where all the members have links with each other (Berardo, 2014).

This relationship structure may be attractive to local actors because overlapping relations generate redundant information and reputational incentives, increasing credibility among peers, creating opportunities for trust building (Abbasi, 2014; Andrew & Carr, 2013; Jung & Song, 2015), and reducing the transaction costs associated with compliance with agreements (Berardo 2014; Tao & Zhang, 2020). Considering these arguments, the bonding hypothesis in its endogenous dimension is:

H1a. In inter-municipal networks, a tendency to transitive grouping will predominate.

The exogenous dimension of bonding refers to the tendency of the actors to form ties with those with whom they share similar attributes. This way of relating, known as homophily (McPherson et al., 2001), has been understood as an important component of bonding-based social capital (Putnam & Goss, 2002). In governance studies, the actors’ similarities in territorial characteristics and political affinities are types of homophily that appear as determinants of network formation (Gerber, Henry, & Lubell, 2013; Li & Mostafavi, 2021; Siciliano, Wang, & Medina, 2021; Song, Park, & Jung, 2018).

For the actors, a tendency to interact with similar partners has advantages. Similarities in relevant characteristics suggest the existence of homogeneous mental maps that favor a common definition of problems and possible solutions (Henry, Lubell, & McCoy, 2010; Yeo, 2018). Such common ground reduces conflicts, facilitating negotiation and generating reciprocity practices and trust, all of which reduces the risks of inaction, division, and desertion (Chen, Ma, Feiock, & Suo, 2019). Based on these advantages, the bonding hypothesis in its exogenous dimension is:

H1b. In inter-municipal networks, a tendency to territorial and political homophily will predominate.

3.2 Bridging hypothesis

An alternative form of relating is bridging. Its endogenous dimension refers to the tendency to associate with actors who have been disproportionately selected by the rest of the network (Tao & Zhang, 2020). This can be depicted as a star-shaped structure in which a central actor connects others who are not directly connected among themselves (Berardo, 2014).

Partnering with a central actor may be attractive for local governments because, in seeking to maximize benefits, they can access information and resources they would not otherwise be able to capture (Feiock, 2013). The central actors play a key role by connecting isolated groups and transmitting new and non-redundant information. Consequently, structures of this type contribute

to global coordination (Shrestha, 2022) and, at the same time, increase regional capacity to generate innovative responses to complex problems (Berardo, 2014). Considering these propositions, the bridging hypothesis based on its endogenous dimension is:

H2a. In inter-municipal networks, star-shaped structures will predominate.

The exogenous dimension of bridging refers to the actors' propensity to establish ties with those who have different characteristics (Nohrstedt & Bodin, 2020; Siciliano et al., 2021). This way of relating is known as heterophily and has been understood as a key component of bridging-based social capital (Putnam & Goss, 2002). A prominent line of research examines heterophily as a determinant of network formation (Nohrstedt & Bodin, 2020), underpinned by resource dependence theory (Pfeffer & Salancik, 2003).

The tendency to interact with different actors may benefit local governments by allowing them to access not only diverse information, but also a range of resources, technologies, and expertise that can increase individual institutional problem-solving capacity (Jung et al., 2017). Instead of wasting energy in obtaining redundant information (Feiock, 2013; Siciliano et al., 2020), the actors can expand their available resources by interacting with different peers and ensuring higher levels of efficiency in collaborative processes. Based on these advantages, the bridging hypothesis in its exogenous dimension is:

H2b. In inter-municipal networks, a tendency to resource-based heterophily will predominate.

3.3 Hypothesis of combination of bonding and bridging

Although bonding and bridging have been posited as alternative ways of relating, an emerging line of research argues that both structures may exist simultaneously (Berardo & Lubell, 2016; Nohrstedt, 2018; Siciliano et al., 2020).

When multiple collective action dilemmas coexist, the complementarity of relationship structures may be desirable for good governance performance insofar as they each have particular benefits that are not necessarily mutually exclusive (Siciliano et al., 2020; Yi, 2018). This argument suggests that a combination of bonding and bridging is more likely to be found at the regional governance level where diverse collective action problems operate simultaneously, rather than in inter-municipal networks differentiated by the available collaborative mechanisms. Considering these propositions, the following hypothesis is presented:

H3: In the regional governance network, which brings together the different mechanisms of inter-municipal collaboration, a tendency to bonding and bridging will predominate simultaneously.

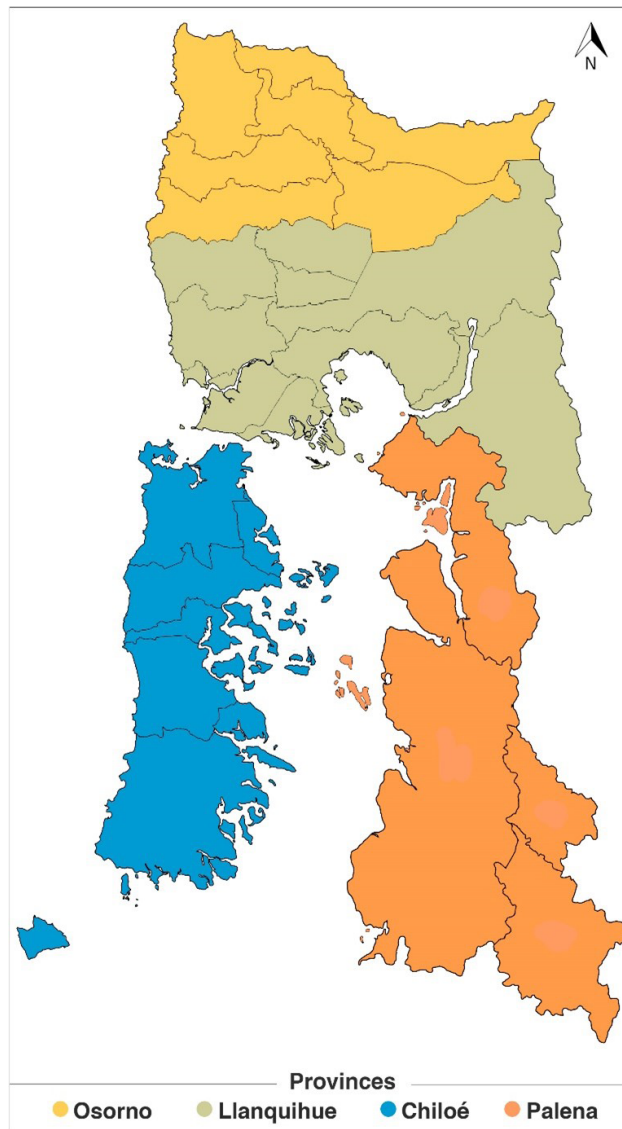
Background to the case study is presented below, describing the differentiated mechanisms of inter-municipal collaboration, which reveal three networks – network of agreements, network of associations, and regional governance network – on which the bonding and bridging hypotheses are tested.

4. CASE STUDY

This article examines inter-municipal governance in the Los Lagos Region of Chile. The region has some 900,000 inhabitants concentrated in its main urban centers (Instituto Nacional de Estadísticas [INE], 2019).

Under Chile’s unitary design, the Los Lagos Region has two regional authorities: a Governor, elected directly by popular election, who chairs the Regional Council, and a Regional Delegate appointed by the country’s President. The region is currently divided into four provinces, each administered by a Provincial Delegate appointed by the President, and 30 municipal districts, each administered by a municipal government headed by a Mayor and a Municipal Council, both democratically elected.

FIGURE 1 MAP OF THE INSTITUTIONAL FRAGMENTATION OF THE LOS LAGOS REGION, CHILE



Source: Elaborated by the authors.

Figure 1 shows the division of regional authority into the different political-administrative units of the Los Lagos Region. This regional institutional fragmentation poses dilemmas for collective action that can be mitigated through inter-municipal collaboration (Deslatte & Feiock, 2018). In the region, this collaboration has been implemented mainly through two mechanisms envisaged in the legislation: collaboration agreements, mostly in the form of bilateral agreements established for specific situations (Law N° 18.695), and municipal associations, generally as multilateral arrangements to address complex issues (Law N° 20.527).

In the Los Lagos Region, these collaboration mechanisms have emerged in a context marked by development dilemmas between extractivist natural resource-based economic growth and protection of the region's biogeographic diversity. In this framework, 63 agreements were identified for the period between 2016 and 2021. They established general frameworks for collaboration on different policy issues such as territorial management, economic development, and municipal strengthening. In this period, eight municipal associations were also established, mainly for environmental management and development issues. This study examines the relationship structures that shape the networks of agreements, associations, and their aggregation under the notion of regional governance.

5. METHODS

To construct the inter-municipal networks, the study used secondary sources documenting relationships between municipal governments in all policy areas without distinction. The period taken for identifying the networks was the last full mayoral term (2016-2021).

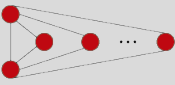


The Network of Agreements was constructed using information about collaboration agreements involving two or more of the region's municipal governments. The information was obtained from the Transparency Portal of the region's 30 municipal governments and was gathered in two phases: 1) Compilation of documents relating to the formalization of agreements available on the websites of the municipal governments' Transparency Portals, and 2) Triangulation of this information with the data on collaboration agreements requested from each municipal government. To construct the second network, the Network of Associations, information was obtained from the Unique Register of Municipal Associations, held by the Undersecretariat for Regional Development. Finally, the Regional Governance Network was constructed by aggregating the two previous matrices to reflect the set of inter-municipal interactions that exist in the Los Lagos Region.

The systematization of agreements, associations, and their aggregation produced three symmetric binary adjacency matrices that take the value of one (1) when the pair of municipal governments collaborates via agreement and/or association, and zero (0) when collaboration is absent.

To test the hypotheses in the three networks, exponential random graph models (ERGMs) were calculated using the R statistical program. ERGMs are models to explain the formation of networks that can conceptually be assimilated to a logistic regression where the link between two nodes is predicted based on network configurations that can be viewed as independent variables (Nohrstedt, 2018). The ERGM assigns coefficients and significance levels that express changes in the probability of a link's existence as a function of the change in an independent endogenous or exogenous variable (Palacios & Villalobos, 2016). Thus, configurations are a probable outcome of a social process within the network that occur more frequently than randomly expected when controlling for other relevant processes (Nohrstedt, 2018).

Box 1 operationalizes the bonding hypotheses. The “Transitive Grouping” parameter (*gwesp*), which corresponds to a higher-order statistic that measures the existence of multiple triad clusters, is used to capture the endogenous component (Hypothesis 1a). A positive coefficient indicates that the actors tend to group with those with whom they share a common tie.

BOX 1 HYPOTHESES ASSOCIATED WITH BONDING: SYNTHESIS OF THE OPERATIONALIZATION OF THE VARIABLES, PARAMETERS, CONFIGURATIONS, AND SOURCES OF INFORMATION



Hypothesis	Dimension	Parameter	Configuration	Variables	Source of information
H1a	Endogenous	Transitive grouping (<i>gwesp</i>)		BINARY Inter-municipal relations: Collaboration agreements Associations	Transparency Portals of the region’s municipal governments for 2016-2022 (www.portaltransparencia.cl)
		Geographical homophily (<i>nodematch</i>)		CATEGORICAL Province: Chiloé, Llanquihue, Osorno, and Palena	Official register of the Los Lagos Regional Government (https://www.goreloslagos.cl/)
H1b	Exogenous	Political homophily (<i>nodematch</i>)		CATEGORICAL Mayor’s political coalition: Right, Left, Independent	Official registers provided by the Electoral Service (SERVEL) for the 2016 elections (https://historico.servel.cl/)

Source: Elaborated by the authors.

The exogenous component of bonding measures “Territorial Homophily” and “Political Homophily” (Hypothesis 1b) using the *nodematch* parameter, a statistic that calculates the probability of a link between nodes that have an attribute in common. To measure territorial homophily, the categorical variable ‘Province’ was constructed using information from the website of the Los Lagos Regional Government about the region’s jurisdictional division. Political homophily was calculated based on the variable ‘Political Coalition’, constructed with information from the Electoral Service (SERVEL). This variable categorizes municipal governments according to the mayor’s political affiliation.

Box 2 operationalizes the bridging hypotheses. The endogenous component is measured using the “Star-shaped Structure” parameter (*gwdegree*), a higher-order statistic that captures the network’s tendency to concentrate around a few popular actors (Hypothesis 2a). A positive coefficient indicates a propensity to centralization.




BOX 2 HYPOTHESES ASSOCIATED WITH BRIDGING: SYNTHESIS OF THE OPERATIONALIZATION OF THE VARIABLES, PARAMETERS, CONFIGURATIONS, AND SOURCES OF INFORMATION

Hypothesis	Dimension	Parameter	Configuration	Variables	Source of information
H2a	Endogenous	Star-shaped structure (<i>gwdeg</i>)		BINARY Inter-municipal relations: Collaboration agreements Associations	Transparency Portals of the region's municipal governments for 2016-2022 (www.portaltransparencia.cl)
H2b	Exogenous	Resource heterophily (<i>absdiff</i>)		CONTINUOUS Resources: Own permanent income (millions of pesos), Number of employees (N°), Level of professionalization (%)	Official register of the National System of Municipal Information for 2016 (http://datos.sinim.gov.cl/datos_municipales.php)

Source: Elaborated by the authors.

The exogenous component of bridging is measured through “Resource Heterophily”, using the *absdiff* parameter, a statistic that calculates the probability of a link between those with absolute differences in certain attributes. For this study, heterophily was calculated using three continuous variables that compile information from the National System of Municipal Information (SINIM) about municipal governments’ own permanent income (in millions of pesos), number of employees (N°), and level of professionalization (%).

BOX 3 CONTROL VARIABLES: SYNTHESIS OF THE OPERATIONALIZATION OF THE VARIABLES, PARAMETERS, CONFIGURATIONS, AND SOURCES OF INFORMATION

Parameter	Configuration	Variable	Source of information
Activity by type of province of actor (<i>nodefactor</i>)		CATEGORICAL Province: Chiloé, Llanquihue, Osorno, and Palena	Official register of the Los Lagos Regional Government (https://www.gorelосlagos.cl/)
Activity by type of coalition of actor (<i>nodefactor</i>)		CATEGORICAL Mayor's political coalition: Right, Left, Independent	Official registers provided by the Electoral Service (SERVEL) for the 2016 elections (https://historico.servel.cl/)
Activity of level of resources of actor (<i>nodecov</i>)		CONTINUOUS Resources: Own permanent income (millions of pesos), Number of employees (N°), Level of professionalization (%), Poverty (%)	Official register of the National System of Municipal Information for 2016 (http://datos.sinim.gov.cl/datos_municipales.php)

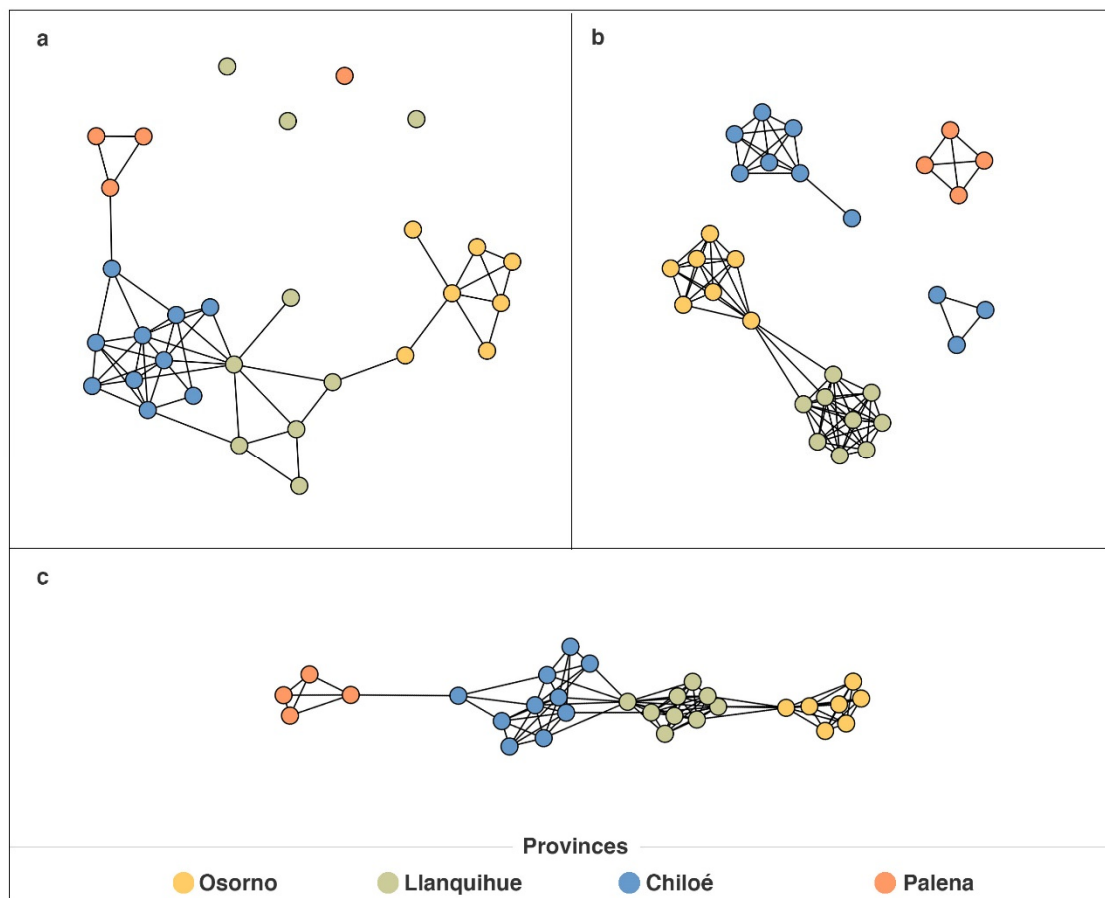
Source: Elaborated by the authors.

Finally, the control variables, including the parameter of density (edges) and activity were incorporated. To measure the activity associated with the actors' attributes, the *nodefactor* parameter was used for the categorical variables 'Province' and 'Political Coalitions' and the *nodecov* parameter for the continuous variables 'Own Permanent Income', 'Number of Employees', 'Professionalization', and 'Poverty'. Positive results for these coefficients indicate that those with the measured attribute have a greater propensity to establish relationships, independently of the pair's characteristics.

6. RESULTS AND DISCUSSION

Figure 2 illustrates the inter-municipal networks, with the circles representing the municipal governments and the lines their collaborative relationships. Figure 2a shows municipal participation in collaborative agreements and Figure 2b in municipal associations while Figure 2c represents their aggregation to produce the regional governance network.

FIGURE 2 INTER-MUNICIPAL NETWORKS OF REGIONAL GOVERNANCE IN THE LOS LAGOS REGION, CHILE



Source: Elaborated by the authors.

Table 1, with the networks’ descriptive statistics, indicates that, despite their low density (2.3%-1.3%), inter-municipal networks reduce the region’s institutional fragmentation. The regional governance network agglomerates all the municipal units into a single component that has a fragmentation of 51%, followed by the network of collaboration agreements with a fragmentation of 68%, and the network of associations with 74%.

At 23%, centralization is highest in the regional governance network, followed by the network of agreements (20%) and the network of associations (12%). In turn, the transitivity of the three networks suggests that most closed triangles are found in the context of associations (9%), followed by the governance network (8%), and the network of agreements (5%).

TABLE 1 DESCRIPTIVE STATISTICS BY NETWORK

Statistic	Network of agreements	Network of associations	Regional governance network
Connections	110	170	202
Density	0.13	0.2	0.23
Components	5	4	1
Fragmentation	0.68	0.74	0.51
Centralization	0.2	0.12	0.23
Transitivity	0.54	0.92	0.75

Source: Elaborated by the authors.

These descriptive statistics shed light on the presence of some central actors and triangular structures; however, they do not provide a definitive answer to the question of the prevalence of bonding and/or bridging. For this purpose, we undertook a statistical analysis of the networks using ERGMs.

Table 2 presents the results of these models. The density parameter is negative and significant in all three models, indicating that there are fewer ties in these networks than would be expected in random networks controlling for other configurations included in the models.

TABLE 2 ERGMS OF INTER-MUNICIPAL GOVERNANCE NETWORKS IN THE LOS LAGOS REGION

Effects	<i>Model 1</i> agreements	<i>Model 2</i> associations	<i>Model 3</i> regional governance
Bonding hypotheses			
Transitive grouping (H1a)	0.87**	3.37***	1.38***
(<i>gwesp</i>)	(0.30)	(0.73)	(0.39)
Territorial homophily (H1b)	3.13***	3.11***	3.40***
(<i>nodematch</i> Province)	(0.64)	(0.90)	(0.76)
Political homophily (H1b)	0.09	-0.21	0.03
(<i>nodematch</i> political coalition)	(0.45)	(0.63)	(0.50)
Bridging hypotheses			
Star-shaped structure (H2a)	0.21	5.43**	21.51**
(<i>gwdegree</i>)	(1.02)	(1.85)	(0.31)
Resource heterophily (H2b)	0.01	-0.00	0.02*
(<i>absdiff</i> Own permanent income)	(0.01)	(0.01)	(0.01)
Resource heterophily (H2b)	0.01	0.01	0.00
(<i>absdiff</i> N° employees)	(0.01)	(0.01)	(0.01)
Resource heterophily (H2b)	0.05	0.02	0.02
(<i>absdiff</i> N° of professionals)	(0.04)	(0.04)	(0.04)
Control			
Density	-6.80***	-12.19***	-6.87***
(<i>edge</i>)	(1.22)	(2.28)	(1.05)
Professionalization	0.05*	-0.08**	-0.03
(<i>nodecov</i>)	(0.02)	(0.03)	(0.02)
Employees	0.00	-0.01	0.00
(<i>nodecov</i>)	(0.01)	(0.01)	(0.01)
Poverty	-0.04	0.05	0.01
(<i>nodecov</i>)	(0.03)	(0.04)	(0.03)
Own permanent income	-0.01	0.02*	0.02

Continue

Effects	Model 1 agreements	Model 2 associations	Model 3 regional governance
(<i>nodecov</i>)	(0.01)	(0.01)	(0.01)
Provinces	0.42	-0.95	-5.27***
(<i>nodefactor</i>)	(0.44)	(0.78)	(0.95)
Political coalitions	-0.89	-0.90	-1.82**
(<i>nodefactor</i>)	(0.46)	(0.60)	(0.67)
Model fit			
AIC	192.61	111.47	173.68
BIC	253.74	172.60	234.81

***P<0.001; **P<0.01; *P<0.05

Source: Elaborated by the authors.

The most important finding is the prevalence in the three networks of relationship structures based on bonding social capital in both its endogenous and exogenous dimensions. The “Transitive Grouping” parameter has positive and significant coefficients in the three models (0.87/p<0.01; 3.37/p<0.001, and 1.38/p<0.001, respectively), providing evidence to support Hypothesis 1^a on the actors’ tendency to form closed triangular structures, rather than other configurations expected in random processes. In the ICA framework, this implies that the region’s municipal governments prefer to collaborate more actively with those with whom they share a partner as enabling them to access redundant information and reduce the risk of non-compliance with agreements. This is consistent with earlier work indicating that, by forming closed structures, actors can ensure reliable relationships based on reputational premises and credible commitment (Berardo, 2014; Tao & Zhang, 2020).

The “Territorial Homophily” parameter also has positive and significant coefficients in the three models (3.13, 3.11, and 3.40, p<0.001, respectively), suggesting that the region’s municipal governments are more prone to establish collaborative ties with municipal governments in the same province, rather than with those in another province. According to ICA, a tendency to territorial homophily suggests that municipal governments that are exposed to similar contextual conditions will prefer to collaborate with those with whom they can jointly address common problems, taking advantage of economies of scale in the solution and reducing the costs of negotiating and monitoring collaboration (Feiock, 2013).

This result is consistent both with earlier work that has emphasized the effects of geographical homophily and with studies of inter-municipal cooperation in Latin America that have demonstrated the importance of the intermediate (or provincial) institutional level as a factor in collaboration (Mazzalay, 2015). Both lines of work argue that similarity of territorial characteristics is conducive to the development of a common understanding of problems and solutions, which, in turn, facilitates communication and negotiation processes (Aung & Lim, 2021; Siciliano et al., 2021; Tao & Zhang, 2020).

The results partially validate Hypothesis 1b since the “Political Homophily” parameter is not significant for any of the models. The absence of political homophily in the formation of inter-municipal cooperation networks has also been reported by different studies in Chile and other Latin American countries (Arias-Yurisch et al., 2022), suggesting that the phenomenon may have particularities in the continent.

The prevalence of bonding in all three models and its consistency in the results for its endogenous and exogenous dimensions indicate a clear and prominent preference for the strategic use of social capital of this type to generate relationship structures in the Los Lagos Region. This makes sense because a bonded community of cooperators with high levels of trust and convergence can reduce the costs and risks of collaboration, particularly those related to inaction, communication problems, and the desertion of participants (Nohrstedt & Bodin, 2020; Tao & Zhang, 2020; Yeo, 2018). According to these results, bonding social capital cannot be underestimated as serving as social infrastructure to mitigate the problems associated with institutional fragmentation and strengthen regional governance.

In contrast to the transversality and consistency of bonding in the three networks, there is no evidence of a tendency to bridging. In Models 2 and 3, the coefficients of the “Star-shaped Structure” parameter are positive and significant ($5.43/p<0.01$ and $21.51/p<0.001$, respectively), providing grounds for rejecting Hypothesis 2a in the network of associations and the regional governance network. This indicates that, in these networks, there are not actors who are disproportionately selected by their peers and act as bridges between disconnected people, permitting access to new and diverse information. This tendency to debridging or decentralization can be understood in the context of complex networks that address multiple issues with a larger number of actors, rather than in the case of specific bilateral agreements such as collaboration agreements.

In Model 3, the coefficient of the “Resource Heterophily” parameter is positive and significant ($0.02/p<0.05$), validating Hypothesis 2b for the regional governance network. This indicates that municipal governments prefer to form ties with actors who differ from them in terms of financial resources. This is consistent with resource dependence theory (Pfeffer & Salanick, 2003), which asserts that, in a profit-maximizing behavior, some organizations will seek to make up for individual deficiencies by relating with those with greater resources while the latter will seek to interact to increase their power and influence at the regional level.

The results of Model 3 partially confirm Hypothesis 3 in that tendencies to bonding and bridging in its exogenous dimension coexist in the regional governance network. This implies that, at the regional level, local actors seek to relate with actors who are similar in territorial terms and actors who are dissimilar in resource terms. This result is consistent with the argument that the combination of relationship structures at the regional level may increase institutional governance capacity by leveraging the benefits of both types of social capital.

All in all, the results of the three models suggest that the types of collaboration mechanism and their simultaneous operation matter when studying the phenomenon of inter-municipal collaboration networks. Even at the level of control variables, there are significant differences depending on the collaboration mechanism, with higher levels of municipal government professionalization and

resources influencing collaboration in a differentiated way. Consequently, for the local actors, each mechanism offers incentives and generates particular expectations. When interacting in the regional reality, these can, in turn, create new incentives for relating.

The results of this study underline the institutional complexity of regional governance. At the inter-municipal level, distinguishing between collaboration mechanisms permits a deeper understanding of the actors' logic of behavior and the strategic use of different types of social capital. At the regional level, where the collaborative mechanisms are integrated, the results show that the different types of social capital are not mutually exclusive and can complement each other, shaping a structure that may increase regional capacity to solve complex problems. In this regard, inter-municipal networks, which reflect the strategic uses of different types of social capital, have the potential to increase the probability of success of both individual and collective action and, therefore, become a critical resource in current processes of strengthening regional governance.

7. CONCLUSIONS

The phenomenon of inter-municipal collaboration and its different mechanisms has become an increasingly attractive object of research in the context of regional governance. However, too little is still known about the formation of inter-municipal networks and, particularly, the relationship structures adopted by local actors facing complex problems in scenarios of institutional fragmentation. Applying the premises of the theoretical body of institutional collective action and using ERGMs, this study has examined the prevalence of bonding and bridging structures in a bid to explain the formation of the governance network in the Los Lagos Region of Chile.

The results show the consistent prevalence of bonding structures in the three networks examined. This makes sense in that relating with close and similar actors is a type of strategic social capital that can reduce the costs and risks of collaboration by facilitating interaction, building trust, and ensuring credible commitments and shared understandings (Nohrstedt & Bodin, 2020; Tao & Zhang, 2020; Yeo, 2018).

In addition, the results reveal an absence of endogenous bridging structures in the three networks. Indeed, the Network of Municipal Associations and the Regional Governance Network both show a tendency towards debridging. This may suggest that, in contexts of more complex multilateral collaboration, relationship structures are more decentralized without prioritizing access to the diversity of resources and information available.

Beyond the results on the formation of collaborative networks, the coexistence of relationship structures can be understood as a valuable resource with the potential to enhance the effectiveness of regional governance by leveraging the advantages of each configuration and mitigating their potential negative consequences (Berardo & Lubell, 2016; Nohrstedt, 2018). This argument is particularly relevant in contexts where only bonding structures prevail, creating a potential risk of inconsistencies in regional public action (Norbutas & Corten, 2018) and territorial segregation (Gerber et al., 2013; Melamed et al., 2020).

In this case, the coexistence of bridging can create links between closed groups and foster the flow of resources and diverse information between them, favoring the integration of isolated actors into the network, regional coordination processes, and even the reduction of territorial inequities

(Shrestha, 2022). Future research should look further into the impact of the coexistence of relationship structures on regional performance.

Finally, the results of this study have two limitations. The first arises from the use of the ERGM method. Rather than directly examining the social processes underlying the formation of ties, it seeks to explain actors' decisions by interpreting these processes based on observation of the networks. Future qualitative studies are, therefore, needed to complement the results presented here with an in-depth exploration of the actors' motivations in forming networks of collaboration. Second, the findings presented here refer to just one region of Chile. In order to accumulate knowledge about regional governance patterns, it is, therefore, important to continue replicating studies of this type in other parts of the country and Latin America to test the prevalence of relationship structures associated with the different types of social capital and their mixture depending on the particular collaborative mechanism.

REFERENCES

- Abbasi, A. (2014) Link formation pattern during emergency response network dynamics. *Natural Hazards*, 71, 1957-1969. Retrieved from <https://doi.org/10.1007/s11069-013-0988-0>
- Andrew, S., & Carr, J. (2013). Mitigating uncertainty and risk in planning for regional preparedness: The role of bonding and bridging relationships. *Urban Studies*, 50(4), 709-724. Retrieved from <https://doi.org/10.1177/0042098012455718>
- Andrew, S., Arlikatti, S., Siebeneck, L., Pongponrat, K., & Jaikampan, K. (2016). Sources of organisational resiliency during the Thailand floods of 2011: a test of the bonding and bridging hypotheses. *Disasters*, 40(1), 65-84. Retrieved from <https://doi.org/10.1111/disa.12136>
- Ansell, C., & Gash, A. (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, 18(4), 543-571. Retrieved from <https://doi.org/10.1093/jopart/mum032>
- Arias-Yurisch, K., Retamal-Soto, K., & Ramos-Fuenzalida, C. (2019). Inter-municipal cooperation in Latin America: current situation and future research challenges. *Revista de Administração Pública*, 53(3), 575-591. Retrieved from <https://doi.org/10.1590/0034-761220180042x>
- Arias-Yurisch, K., Retamal-Soto, K., & Ramos-Fuenzalida, C. (2022). The prevalence of a bonding strategy in COVID-19 response networks: explaining intermunicipal partnering in the Santiago metropolitan region, Chile. *Regional Studies*. Retrieved from <https://doi.org/10.1080/00343404.2022.2141465>
- Aung, T., & Lim, S. (2021). Evolution of collaborative governance in the 2015, 2016, and 2018 Myanmar flood disaster responses: A longitudinal approach to a network analysis. *International Journal of Disaster Risk Science*, 12(2), 267-280. Retrieved from <https://doi.org/10.1007/s13753-021-00332-y>
- Berardo, R. (2014). Bridging and bonding capital in two-mode collaboration networks. *Policy Studies Journal*, 42(2), 197-225. Retrieved from <https://doi.org/10.1111/psj.12056>
- Berardo, R., & Lubell, M. (2016). Understanding what shapes a polycentric governance system. *Public Administration Review*, 76(5), 738-751. Retrieved from <https://doi.org/10.1111/puar.12532>
- Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018). *Analyzing social networks*. Thousand Oaks, CA: Sage.
- Bourdieu, P. (1980). Le capital social. *Actes de la recherche en sciences sociales*, 31(1), 2-3. Retrieved from https://www.persee.fr/doc/arss_0335-5322_1980_num_31_1_2069
- Chen, B., Ma, J., Feiock, R. C., & Suo, L. (2019). Factors influencing participation in bilateral interprovincial agreements: Evidence from China's Pan Pearl River Delta. *Urban Affairs Review*, 55(3), 923-949. Retrieved from <https://doi.org/10.1177/10780874188250>
- Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.
- Contractor, N. S., Wasserman, S., & Faust, K. (2006). Testing multitheoretical, multilevel hypotheses about organizational networks: An analytic framework and empirical example. *The Academy of Management Review*, 31(3), 681-703. Retrieved from <https://doi.org/10.5465/amr.2006.21318925>
- Deslatte, A., & Feiock, R. C. (2019). The collaboration riskscape: Fragmentation, problem types and preference divergence in urban sustainability. *Publius: The Journal of Federalism*, 49(2), 352-377. Retrieved from <https://doi.org/10.1093/publius/pjy020>
- Desmarais, B. A., & Cranmer, S. J. (2012). Micro-level interpretation of exponential random graph models with application to estuary networks. *Policy Studies Journal*, 40(3), 402-434. Retrieved from <https://doi.org/10.1111/j.1541-0072.2012.00459.x>
- Feiock, R. C. (2013). The institutional collective action framework. *Policy Studies Journal*, 41(3), 397-425. Retrieved from <https://doi.org/10.1111/psj.12023>
- Feiock, R. C., & Scholz, J. T. (2010). *Self-organizing federalism*. Cambridge, UK: Cambridge University Press.
- Foster, K., & Barnes, W. (2012). Reframing regional governance for research and practice. *Urban Affairs Review*, 48(2), 272-283. Retrieved from <https://doi.org/10.1177/1078087411428>

- Fürst, D. (2003). Regional Governance zwischen Wohlfahrtsstaat und neo-liberaler Marktwirtschaft. In I. Katenhusen, & W. Lamping (Eds.), *Demokratien in Europa*. Hessen, Deutschland: Springer. Retrieved from https://doi.org/10.1007/978-3-663-09584-2_12
- Gerber, E., Henry, A., & Lubell, M. (2013). Political homophily and collaboration in regional planning networks. *American Journal of Political Science*, 57(3), 598-610. Retrieved from <https://doi.org/10.1111/ajps.12011>
- Granovetter, M. S. (1973). The strength of weak ties. *American journal of sociology*, 78(6), 1360-1380. Retrieved from <https://www.jstor.org/stable/2776392>
- Granovetter, M. (2000). *A theoretical agenda for economic sociology*. Retrieved from <https://escholarship.org/uc/item/4mk4g08q>
- Groenleer, M., & Hendriks, F. (2020). Subnational mobilization and the reconfiguration of central-local relations in the shadow of Europe: the case of the Dutch decentralized unitary state. *Regional & Federal Studies*, 30(2), 195-217. Retrieved from <https://doi.org/10.1080/13597566.2018.1502179>
- Henry, A., Lubell, M., & McCoy, M. (2011). Belief systems and social capital as drivers of policy network structure: The case of California regional planning. *Journal of public administration research and theory*, 21(3), 419-444. Retrieved from <https://doi.org/10.1093/jopart/muq042>
- Instituto Nacional de Estadísticas. (2019, June). *Estimaciones y proyecciones de la población de Chile 2002-2035: Síntesis de resultados*. Retrieved from https://www.ine.gob.cl/docs/default-source/proyecciones-de-poblacion/publicaciones-y-anuarios/base-2017/ine_estimaciones-y-proyecciones-2002-2035_base-2017_reg_área_síntesis.pdf?sfvrsn=aaeb88e7_5
- Jung, K., & Song, M. (2015). Linking emergency management networks to disaster resilience: bonding and bridging strategy in hierarchical or horizontal collaboration networks. *Quality & Quantity*, 49(4), 1465-1483. Retrieved from <https://doi.org/10.1007/s11135-014-0092-x>
- Jung, K., Song, M., & Feiock, R. C. (2017). Isolated and broken bridges from interorganizational emergency management networks: An institutional collective action perspective. *Urban Affairs Review*, 55(3), 950-975. Retrieved from <https://doi.org/10.1177/10780874176902>
- Kantor, P., Lefèvre, C., Saito, A., Savitch, H., & Thornley, A. (2012). *Struggling giants: city-region governance in London, New York, Paris, and Tokyo*. Minneapolis, MN: University of Minnesota Press.
- Kim, S. (2020). Inter-municipal relations in city-region governance. *Cities*, 104, 102771. Retrieved from <https://doi.org/10.1016/j.cities.2020.102771>
- Kim, S., Swann, W., Weible, C., Bolognesi, T., Krause, R., Park, A., ... Feiock, R. C. (2022). Updating the institutional collective action framework. *Policy Studies Journal*, 50(1), 9-34. Retrieved from <https://doi.org/10.1111/psj.12392>
- Kübler, D., & Heinelt, H. (2004). Metropolitan governance, democracy and the dynamics of place. In H. Heinelt & D. Kübler (Eds.), *Metropolitan Governance in the 21st Century: Capacity, Democracy and the Dynamics of Place*. London, UK: Routledge.
- Ley N° 18.695. (2007). *Orgánica Constitucional de Municipalidades*. Retrieved from <https://bcn.cl/2f796>
- Ley N° 20.527. (2012). *Modifica la Ley N° 18.695, Orgánica Constitucional de Municipalidades y regula las Asociaciones Municipales*. Retrieved from <https://bcn.cl/3c2fz>
- Li, Q., & Mostafavi, A. (2021). Local interactions and homophily effects in actor collaboration networks for urban resilience governance. *Applied Network Science*, 6(1), 1-18. Retrieved from <https://doi.org/10.1007/s41109-021-00433-z>
- Lin, N. (2012). *Social capital: A theory of social structure and action*. Cambridge, UK: Cambridge University Press.
- Lubell, M., Scholz, J., Berardo, R., & Robins, G. (2012). Testing policy theory with statistical models of networks. *Policy Studies Journal*, 40(3), 351-374. Retrieved from <https://doi.org/10.1111/j.1541-0072.2012.00457.x>
- Mazzalay, V. (2015). Redes de cooperación intermunicipal en contextos de autonomía local. Cambios y continuidades en el caso de la Región Metropolitana de Córdoba. *Studia Politicae*, 36, 5-36. Retrieved from <https://revistas.bibdigital.uccor.edu.ar/index.php/SP/article/view/633>

- McPherson, M., Smith-Lovin, L., & Cook, J. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27(1), 415-444. Retrieved from <https://doi.org/10.1146/annurev.soc.27.1.415>
- Melamed, D., Sweitzer, M., Simpson, B., Abernathy, J. Z., Harrell, A., & Munn, C. W. (2020). Homophily and segregation in cooperative networks. *American Journal of Sociology*, 125(4), 1084-1127. Retrieved from <https://doi.org/10.1086/708142>
- Meza, O., Grin, E., Fernandes, A., & Abrucio, F. (2019). Intermunicipal cooperation in metropolitan regions in Brazil and Mexico: does federalism matter? *Urban Affairs Review*, 55(3), 887-922. Retrieved from <https://doi.org/10.1177/1078087418816433>
- Miller, D., Nelles, J., Dougherty, G., & Rickabaugh, J. (2019). *Discovering American regionalism: An introduction to regional intergovernmental organizations*. London, UK: Routledge.
- Nelles, J. (2012). *Comparative metropolitan policy: Governing beyond local boundaries in the imagined metropolis*. London, UK: Routledge.
- Nohrstedt, D. (2018). Bonding and bridging relationships in collaborative forums responding to weather warnings. *Weather, Climate, and Society*, 10(3), 521-536. Retrieved from <https://doi.org/10.1175/WCAS-D-17-0134.1>
- Nohrstedt, D., & Bodin, Ö. (2020). Collective action problem characteristics and partner uncertainty as drivers of social tie formation in collaborative networks. *Policy Studies Journal*, 48(4), 1082-1108. Retrieved from <https://doi.org/10.1111/psj.12309>
- Norbutas, L., & Corten, R. (2018). Network structure and economic prosperity in municipalities: A large-scale test of social capital theory using social media data. *Social Networks*, 52, 120-134. Retrieved from <https://doi.org/10.1016/j.socnet.2017.06.002>
- Osborne, S. P. (2010). Introduction The (New) Public Governance: a suitable case for treatment. In S. P. Osborne (Ed.), *The New Public Governance? Emerging Perspectives on the Theory and Practice of Public Governance* (pp. 17-32). London, UK: Routledge.
- Palacios, D., & Villalobos, C. (2016). Redes académicas al interior de las escuelas chilenas: Un estudio exploratorio utilizando Modelos Exponenciales de Grafos Aleatorios (ERGM). *Redes. Revista hispana para el análisis de redes sociales*, 27(2), 33-44. Retrieved from <https://raco.cat/index.php/Redes/article/view/v27-n2-palacios-villalobos>
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford, CA: Stanford University Press.
- Putnam, R. (1993). *Social Capital and Institutional Success. In Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.
- Putnam, R., & Goss K. (2002). Introduction. In R. Putnam (Ed.), *Democracies in flux: The evolution of social capital in contemporary society*. Oxford, UK: Oxford University Press.
- Ramírez-de-la-Cruz, E. E. (2012). Instituciones y gobernanza metropolitana: una primera aproximación al caso de México. *Estudios demográficos y urbanos*, 27(2), 491-520. Retrieved from <https://doi.org/10.24201/edu.v27i2.1420>
- Savitch, H., & Vogel, R. (2000). Introduction: Paths to New Regionalism. *State and Local Government Review*, 32(3), 158-168. Retrieved from <https://doi.org/10.1177/0160323X0003200301>
- Scholz, J., & Lubell, M. (1998). Trust and taxpaying: Testing the heuristic approach to collective action. *American Journal of Political Science*, 42(2), 398-417. Retrieved from <https://doi.org/10.2307/2991764>
- Shrestha, M. K. (2022). How Do Bridging and Bonding Networks Emerge in Local Economic Development Collaboration? *International Journal of Public Administration*. Retrieved from <https://doi.org/10.1080/01900692.2022.2044858>
- Siciliano, M., Carr, J., & Hugg, V. (2020). Analyzing the effectiveness of networks for addressing public problems: Evidence from a longitudinal study. *Public Administration Review*, 81(5), 895-910. Retrieved from <https://doi.org/10.1111/puar.13336>
- Siciliano, M., Wang, W., & Medina, A. (2021). Mechanisms of network formation in the public sector: A systematic review of the literature. *Perspectives on Public Management and Governance*, 4(1), 63-81. Retrieved from <https://doi.org/10.1093/ppmgov/gvaa017>

- Silva, P., Teles, F., & Ferreira, J. (2018). Intermunicipal cooperation: The quest for governance capacity? *International Review of Administrative Sciences*, 84(4), 619-638. Retrieved from <https://doi.org/10.1177/0020852317740411>
- Song, M., Park, H., & Jung, K. (2018). Do political similarities facilitate interlocal collaboration? *Public Administration Review*, 78(2), 261-269. Retrieved from <https://doi.org/10.1111/puar.12887>
- Tao, Z., & Zhang, H. (2020). Partnering Strategies of Organizational Networks in the Complex Environment of Disaster in the Centralized Political Context. *Complexity*, 2020, 9687390. Retrieved from <https://doi.org/10.1155/2020/9687390>
- Tavares, A., & Feiock, R. (2018). Applying an institutional collective action framework to investigate intermunicipal cooperation in Europe. *Perspectives on Public Management and Governance*, 1(4), 299-316. Retrieved from <https://doi.org/10.1093/ppmgov/gvx014>
- Teles, F. (2016). *Local governance and intermunicipal cooperation*. Cham, UK: Springer.
- Tomàs, M. (2020). Metropolitan revolution or metropolitan evolution? The (dis) continuities in metropolitan institutional reforms. In K. Zimmermann, D. Galland, & J. Harrison (Eds.), *Metropolitan regions, planning and governance* (pp. 25-39). Cham, UK: Springer.
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. Cambridge, UK: Cambridge University Press.
- Willi, Y., Pütz, M., & Müller, M. (2018). Towards a versatile and multidimensional framework to analyse regional governance. *Environment and Planning C: Politics and Space*, 36(5), 775-795. Retrieved from <https://doi.org/10.1177/2399654418760>
- Yeo, J. (2018). Antecedents of border management network in El Paso, Texas: An exponential random graph model. *Journal of Homeland Security and Emergency Management*, 15(3), 1-13. Retrieved from <https://doi.org/10.1515/jhsem-2016-0011>
- Yi, H. (2018). Network structure and governance performance: What makes a difference? *Public Administration Review*, 78(2), 195-205. Retrieved from <https://doi.org/10.1111/puar.12886>
- Zambrano-Gutiérrez, J. C., & Avellaneda, C. N. (2022). Inter-municipal vs. Inter-governmental Cooperation: Their Impact on International Aid. *Public Organization Review*. Retrieved from <https://doi.org/10.1007/s11115-022-00676-z>

Karina Retamal-Soto

<https://orcid.org/0000-0001-8663-6744>

Ph.D. in Sociology and Anthropology, Universidad Complutense de Madrid; Master in Democracy and Government, Universidad Autónoma de Madrid; Public Administrator, Universidad de Santiago de Chile; Lecturer at the Department of Policy and Government, Universidad Alberto Hurtado; Investigator of the FONDECYT project. E-mail: kretamal@uahurtado.cl

Karina Arias-Yurisch

<https://orcid.org/0000-0001-9820-6581>

Ph.D. in Public Administration and Policy, Florida State University; Master in Cultural Management, Universidad de Chile; Public Administrator, Universidad de Santiago de Chile; Lecturer at the Department of Management and Public Policy, Universidad de Santiago de Chile; Principal Investigator of the FONDECYT project. E-mail: karina.arias@usach.cl

Camila Ramos-Fuenzalida

<https://orcid.org/0000-0002-7974-4891>

Ph.D. student in Local Government and Public Policy, University of Birmingham; Master in Management and Public Policy, Universidad de Chile; Public Administrator, Universidad de Santiago de Chile; Investigator of the FONDECYT project. E-mail: CXR197@student.bham.ac.uk

AUTHOR'S CONTRIBUTION

Karina Retamal-Soto: Conceptualization (Lead); Data curation (Lead); Methodology (Lead); Writing - original draft (Lead); Writing - review & editing (Lead).

Karina Arias-Yurisch: Conceptualization (Lead); Data curation (Lead); Methodology (Lead); Writing - original draft (Lead); Writing - review & editing (Lead).

Camila Ramos-Fuenzalida: Conceptualization (Lead); Data curation (Lead); Methodology (Lead); Writing - original draft (Lead); Writing - review & editing (Lead).