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# Collaborative Networks Dynamics and Social Capital: A Brazilian Case

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**Abstract.** The ability to mobilize resources through collaborative action is understood as the social capital present in a territory. The presence of social capital can indicate how a collaborative network can be managed. Using a quantitative method, this article aims to analyze the social capital present in collaborative networks, by accessing the case of three collaborative networks in southern Brazil. The results show that social capital can be analyzed according to four factors: proximity, territorial anchorage, reciprocity and collective memory. The elements found can indicate barriers or motivators for the operation of collaborative networks.

**Keywords:** collaborative networks; social capital; survey; Brazil.

## 1 Introduction

Potential partners in a collaborative network (CN) are expected to collaborate with each other in problem solving processes, in the compliance with operational standards, in the establishment of forms of cooperation, in the acceptance of agreements, building trust among its members. This collaboration process requires effort, time, dedication, and disagreements might occur. Transparent governance benefits from an incentive system that encourages proactive participation and recognition of individual contributions [1].

New researches demonstrate that elements, such as values, trust and norms can influence collaboration processes, shape networks and members' behaviors in a significant way and, consequently, indicate the chances of success (or failure) of

collaborative networks. On the other hand, competence or technologic affinities can be important during the preliminary stage of the development of a network [2].

One element of social theory that highlights the potential of a collaborative network is the social capital [3], because it represents the “sum of the actual and potential resources embedded within, available through and derived from the network of relationship possessed by an individual or social unit” [4]. In this sense, social capital is a strongly competitive resource, enhancing the individual and collective capacities through collaborative practices.

Social capital favors collective actions due to the dynamics and density of interactions, changes and learning processes. These learning processes, on its turn, define the ability to intervene and manage change processes, allowing people to act as active agents rather than as merely passive recipients of outside demands [5] [6].

The present paper aims at identifying and analyzing elements of social capital present in collaborative networks, focusing on local aspects and on the links among collaborative networks and the territories in which they are located. By analyzing these elements, we expect to contribute to the debate on inter-organizational issues, such as the elimination of obstacles generated by the environment and/or other organizations which might hamper collaboration processes.

## 2 Theoretical Background

Social capital is a set of informal norms and values common to the members of a specific group which allow cooperation among them.

Since its creation, the concept of social capital is being used to explain specific social phenomena. Most researches have focused on its role in the human capital development [7] [8], in economic performance [9], in regional [10] and national development [11].

In a study that relates social capital and intellectual capital, Nahapiet and Ghoshal [4] propose three social capital macro-dimensions: structural, relational and cognitive. However, such analytical division does not exclude the existence of a close association between their main features.

The structural dimension of social capital is related to the presence or absence of interactions between the members and the configuration or morphology of the network by describing the standards of connections through variables, such as density, connectivity, network configuration, stability, and ties. The relational dimension describes the kind of personal relationship developed through a history of interactions. This concept focuses on aspects that influence behaviors, such as trust and distrust, norms, obligations, expectations and identity. Finally, the cognitive dimension refers to resources that originate shared visions, interpretations and systems of meaning, mainly codes, shared narratives, values, and other cultural elements. Some authors believe that the cognitive dimension is not sufficiently explored in the literature [4].

The promotion and strengthening of solid networks of relationships based on trust, reciprocity and values is more easily done in a micro rather than in macro society

where relationships tend to be more formalized and impersonal. In this sense, it is necessary to analyze the three main characteristics of the collaborative processes that contribute to the creation of a territory [12]:

- a) the society and the community are in balance. The main characteristic is an economy that is autonomous in relation to politics and the functioning of society itself, which brings out the concept of territorial anchorage;
- b) historicity (collective memory), i.e. the social construction of collective cognitive reserves and the learning ability of the agents involved;
- c) reciprocity which determines the relationship between the agents recognized by their life beyond purely commercial transactions.

Pecqueur's elements [12] [13] can be associated with Putnam's [14] and Coleman's ideas [7]. The characteristics of the regionalized production model lead to the establishment of a new local/global relationship around which territorial anchorage and non-spatial production are complexly articulated. In other words, the territory becomes central to the coordination of collaborative actions among players interested in solving unprecedented problems [12]. This can be achieved by the mobilization of the existing social capital and the promotion of collaborative networks.

Local agents able to activate and evaluate the area's social capital, as well as, to change generic into specific resources are increasingly important. Specific resources are unique and differentiated and, consequently, difficult to transpose or translate, being one of the keys to territorial competitiveness and development.

### 3 Method and Context

Data was collected through survey in order to identify and analyze the social capital elements present in collaborative networks and its relation with the territory.

The authors conducted an extensive literature review in order to identify the most significant studies on social capital [4] [15] [16], collaborative networks [1] and territories [12] [17]. The variables to be used in the survey were decided upon after meta-analysis.

All items were measured using a five-point Likert scale (1=strongly disagree; 2=somewhat disagree; 3= neither agree; nor disagree; 4 = somewhat agree; 5=strongly agree). Before formal survey, we conducted semi-structured interviews with three experts in collaborative networks and social capital theory to validate our scale items (these experts are researchers and professors of graduate programs and members of the Social Theory Research Group). We also ran a pre-test with ten respondents.

The survey was conducted in three Brazilian collaborative networks (Caminhos de Pedra, APROBELO and APROVALE) immersed in the same regional culture. These collaborative networks are located in three areas of the Serra Gaúcha region, state of Rio Grande do Sul (Southern Brazil). The APROVALE (Association of Producers of Fine Wines of the Valley of Vinhedos) consists of 31 wineries, and 43 members to support tourism, including hotels, hostels, restaurants, handcraft and antique shops.

The APROBELO (Association of Producers of Fine Wines of Monte Belo) comprises 11 wineries; the Caminhos de Pedra Association has 23 members, including restaurants, hostels and small family businesses.

The networks have a diversified economy, and are located in the largest wine-producing region of Brazil (with approximately 40,000 hectares of vineyards). The region is also characterized by family farms and lower mechanization level, because of the mountainous terrain. Nowadays, rural wine tourism is also an economic resource being explored.

The survey was conducted with employees and company owners. The sample of 206 respondents was chosen by convenience [18]. We used the software PASW statistic 18, to analyze data descriptive and factorial analysis.

#### 4 Results and Discussion

The responses were submitted to PCA (Principal Component Analysis) factor analysis with varimax rotation and pairwise treatment (considering all valid observations of each variable) for missing data. The Kaiser-Meyer-Olkin index (KMO) of sampling adequacy was 0.837 and Bartlett's test of sphericity (significant 0.001) indicated the factorability of the data. The answers submitted to descriptive analysis revealed averages ranging between 2,158 and 4,356, with standard deviations from 0.906 to 1.836.

The Cronbach's alpha measured for the instrument with the 23 social capital variables resulted in 0.829, demonstrating excellent internal consistency of analyzed variables [19]. Moreover, few cases of missing values were observed.

The final factor analysis resulted in four elements; the percentage of explained variance was 54.52%, which means that the variables chosen and the resulting factors can explain 54% of the area's social capital of the collaborative networks studied. Applied social researches consider that a good result: the classic study of social capital in Australian communities conducted by Onyx and Bullen [15], whose factor analysis explained 49.3% of the variance, is a reference in social capital measurement.

In order to check the consistency of the variables in each factor, values for Cronbach's alpha were calculated. The ideal value in social sciences exploratory studies should be higher than 0.6 [20]. Considering the whole instrument, Cronbach's alpha was 0.833.

The fourth factor presented an Alpha value considered low (0.567). Its removal was not recommended given the significant reduction it would cause in the explained variance and even in the KMO index.

The first factor identified was *proximity* with alpha of 0.813, which is considered a very good result [19]. The variables in this factor concern the participation in associations and organizations, volunteering, participation in the community's festivals and celebrations. These variables are related with situations that promote the coming together of people and groups, either by shared goals (associations/organizations) through volunteer work or at parties and celebrations.

**Table 1** Social capital elements in collaborative networks

| <b>Variables</b>   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> |
|--|----------|----------|----------|----------|
| 11 – I participate in the network  | 0.797    |          |          |          |
| 12 – I do volunteer work   | 0.794    |          |          |          |
| 17 – I participate in parties and celebrations   | 0.790    |          |          |          |
| 13 – I believe that people treat well those arriving from outside to work in the network |          | 0.708    |          |          |
| 16 – The rich and poor live well together  |          | 0.627    |          |          |
| 15 – I feel proud to work to the network   |          | 0.599    |          |          |
| 19 – The local government supports local development                                     |          | 0.584    |          |          |
| 20 – I consider locals trustworthy   |          | 0.505    |          |          |
| 22 – I believe in the future of the territory  |          | 0.480    |          |          |
| 2 – I can count on other members to take important decisions                             |          |          | 0.773    |          |
| 8 – I would not have made it without the help of others                                  |          |          | 0.677    |          |
| 7 – People help each other in the territory  |          |          | 0.561    |          |
| 1 - Co-workers are friends   |          |          |          | 0.712    |
| 14 – I can share a family meal at least once a day                                       |          |          |          | 0.706    |
| 4 – The children and grandchildren are encouraged to follow traditions                   |          |          |          | 0.499    |
| 6 – I know local history   |          |          |          | 0.452    |

Source: present study

The literature describes an oscillatory movement because the coming together is not a “state” but a “tension”. It does not abolish the distance and it is defined by oppositions [21].

The question of proximity can also be understood through the analysis of the three mechanics of social capital (bonding, bridging and linking). A significant difference between bridging and bonding, for example, indicates the distance between heterogeneous groups in the same way that low linking levels indicate the presence of asymmetric power relations [15]. “Taking part in a network” allows discussion of common problems, exchange of information and practical experience, facilitated by territorial proximity. This aspect is decisive for the development of innovations and the building of a sense of inhabiting.

The second factor, *territorial anchorage*, displays a set of variables in which the collaborative network illustrates the sense of experiencing the territory. The social approval of the territory and its resources and the collective investment and believe in its development characterize territorial anchorage.

The variable “people treat well those coming from outside” shows willingness to accept the “different” and indicates a certain degree of openness (51% of the respondents worked for the network and also reside in the territory). The coexistence between rich and poor suggests that, despite economic differences, there is a movement towards the horizontalization of the social relationships.

The variable “feel proud to work to the network” obtained the best performance. Even those who do not live in the area, feels connected through the work. To consider people trustworthy is a key indicator of the presence of social capital; trust allows the establishment of informal standards systems, which facilitates the coordination of existing regional resources, strengthening territorial anchorage. Finally, to “believe that the territory has a future” summarizes the belief that it is worth investing in collaborative network, i.e. there is adherence of individuals and groups to future projects.

The third factor, *reciprocity*, relates to the feeling of obligation one feels to return a favour and to the social embarrassment of anyone who does not cooperate or violates agreed norms [14]. To count on neighbours to take important decisions, to recognize other people’s help (and be socially compelled to repay it) and to consider that the organization is a place of exchange (mutual assistance) are reciprocity indicators. In the literature, norms of reciprocity and participation systems are the main evidence of the presence of social capital.

The fourth factor is designated as *collective memory*, due to variables that show the families’ efforts so their children and grandchildren follow customs and are aware of the region’s history. The other two variables - consider co-workers friends and share a family meal at least once a day – seem, at first, unrelated to the others. However, when we analyzed the difference between the responses of resident and non-resident workers we realized that the residents perform better, i.e. “work” seems to be the link between the variables. Working and living in the same territory offer more opportunities to share family meals and to work with the family, which encourage the teaching of values and customs and contribute to the preservation of the territory’s collective memory.

Among the factors found, three had already been reported in the literature [12] as essential to the process of collective construction. The authors identified these

elements through the analysis of groups and of specific literature. Pecqueur's typology [12] failed to include an element (factor 1 in this study), which the authors linked to the concept of proximity.

## 5 Final Remarks

This study allowed the identification of the members' perception about their interactions and purposes, in other words, the social dynamic. The interaction between members and organizations appears to broaden options to reach common interests and projects, and to break through bureaucratic barriers. The idea is to preserve the group's heterogeneity and seek flexibility, focusing on cooperation without eliminating constructive conflict and competition [22].

Social capital is not disconnected from historical or geographical influences. Therefore, the results were strongly influenced by the context in which they were inserted. Analyzing the main evidences according to that theoretical framework, the authors could collect evidences about the dynamics of collaborative networks and their links to social capital.

The present study identified and analyzed the elements of social capital in territories with collaborative networks based on four main factors: proximity, territorial anchoring, reciprocity and collective memory. In an initial stage, usually technical skills were essential to the network's functioning. Nevertheless, research on the role of social players in territorial building can contribute to broaden the debate on the role of collaborative networks in local development.

The theoretical contribution of the paper is the identification of a new element necessary for the maintenance of collaborative networks in communities: the concept of proximity. Moreover, from the practical perspective, the study provides a social capital assessment tool to access social capital levels in collaborative networks.

Many questions remain to be answered, such as: how to develop new ways of network management capable of dealing with the territorial multiplicity in which we are inserted? How to reinstate a territorialization concept that means not only "controlling" the space, but also its production and experience taking into consideration the collaborative networks?

In conclusion, social capital is not an instrument to be used in isolation, nor it claims to be the single tool to understand the role of collaborative networks embedded in a territory. The authors expect that this study can contribute to the reflection on the obstacles to the establishment of collaborative networks.

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