ARTICLES

DETERMINANTS OF INTER-ORGANIZATIONAL NETWORK FORMATION IN THE CULTURAL SECTOR

Determinantes de la formación de redes interorganizativas en el sector cultural

Determinantes da formação de redes interorganizacionais no setor cultural

ABSTRACT

In recent years, the number of studies applying Social Network Analysis to the formation of inter-organizational networks has increased. This paper analyzed a socio-centric network composed of 32 cultural organizations in Andalusia increase. Multiple Regression Quadratic Assignment Procedure (MR-QAP) at the dyadic level, showed that perceptions of affinity (i.e., homophily) and the possibility of establishing contacts in the future, can exert influence on the establishment of informal contacts. At the internal level, an organization's brokerage position in collaboration project networks is related to the volume of business and the old in the sector. Finally, this article discusses applications for the management of inter-organizational networks in order to strengthen the implementation of public policies.

KEYWORDS | Cultural organizations, inter-organizational networks, partnerships, quadratic assignment procedure, network analysis, partnership.

RESUMEN

En los últimos años se han incrementado las investigaciones que aplican el Análisis de Redes Sociales (ARS) para estudiar la formación de redes interorganizativas. Para determinar estos factores hemos analizado la red sociocéntrica de 32 organizaciones culturales en Andalucía. El procedimiento de asignación cuadrática de regresión múltiple a nivel diádico muestra que la percepción de afinidad (i.e., homofilia) y la posibilidad de establecer contactos en el futuro influyen en el establecimiento de contactos informales. A nivel interno, factores como el volumen de actividad y la antigüedad de la organización en el sector se relacionan con el grado de intermediación de las entidades en la red de colaboración en proyectos. Finalmente discutimos los resultados para optimizar el funcionamiento de redes interorganizativas y fortalecer la implementación de políticas públicas.

PALABRAS CLAVE | *Alianzas, análisis de redes, organizaciones culturales, procedimiento de asignación cuadrática, red interorganizativa.*

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RESUMO

Nos últimos anos, tem aumentado a pesquisa com aplicação de análise de redes sociais para estudar a formação de redes interorganizacionais. Para determinar esses fatores, analisamos a rede sociocêntrica de 32 organizações culturais na Andaluzia. O Problema Quadrático de Alocação de regressão diática múltipla mostrou que a afinidade entre o nível de percepção (homofilia) e a possibilidade de estabelecer contatos no futuro influencia o estabelecimento de contatos informais. Internamente, fatores como volume de atividade e idade da organização no setor associam-se ao grau de intermediação de entidades na rede de colaboração em projetos. Por fim, discutimos os resultados para otimizar o funcionamento das redes interorganizacionais e fortalecer a implementação de políticas públicas.

PALAVRAS-CHAVE | *Alianças, análise de redes, organizações culturais, procedimento de alocação quadrático, redes interorganizacionais.*

INTRODUCTION

Social network analysis (SNA) allows for the understanding of how dynamic systems of a complex nature are structured (Watts & Strogatz, 1998, p. 440). In recent years, we have observed an increase in studies that apply SNA to study multiple social phenomena (Burt, Kilduff, & Tasselli, 2013). This paradigm has captured the attention of researchers from various disciplines who have seen the potential of SNA in understanding the structural properties of social networks which can be understood as the relationships that establish a defined set of actors among themselves (Wasserman & Faust, 1994; Yang, 2008).

The applications of SNA in the organizational environment extend to: (a) the promotion of creativity in organizational contexts (Kim, 2016); (b) analysis of local economic development (Hermans, Sartas, Van Schagen, van Asten, & Schut, 2017); (c) the study of relations between business managers (Crispeels, Willems, & Brugman, 2015); and (d) improved coordination between agencies that provide social services (Otto-Trojel, Rundall, de Bont, & van de Klundert, 2017). In recent decades, there has been an increase in studies in the field of business management that have applied SNA (Sytch, Tatarynowicz, & Gulati, 2012). Structural analysis allows us to discover important issues for business development, such as staff turnover, interdepartmental coordination, or internal promotions (Borgatti & Halgin, 2011, p. 1168).

The evaluation of inter-organizational networks has actively benefited from the systematic application of structural evaluation models. Some of these proposals focus on establishing typologies of key players that can play different roles in the inter-organizational structure (Ramos-Vidal, 2017; Ramos-Vidal & Maya-Jariego, 2013). For their part, Tomasello, Perra, Tessone, Karsai, and Schweitzer (2014) indicate that it is necessary to identify the endogenous and exogenous mechanisms that influence the formation of inter-organizational networks. We found different paradigms that explain the formation of inter-organizational networks. Some of these paradigms highlight the importance of factors such as: (a) the acquisition of competitive advantages (Gulati, 1995; Jansen, 2017); (b) the reduction of uncertainty in changing contexts (Ma, Yao, & Xi, 2009); and (c) the transfer of information (Valente, 1995). Studies conducted by Provan, Huang, and Milward (2009) show that factors related to the reputation, integrity, and perceived influence of organizations positively affect the level of centrality within the sector.

Other studies indicate the relationship between the level of trust and the degree of formalization in trade relations (Gulati, 1995). Dyadic relations are initially characterized by a high level of formalization and rigidity due to the uncertainty associated with the lack of information, but as the relationship consolidates, the formalization is reduced giving way to ties based on commitment. For this reason, we must know the influence that the reputation, the trajectory, and the performance in the sector produce in the decision to form part of strategic partnerships, in the establishment of links with certain organizations, and in the positioning of the companies in inter-organizational networks. Next, we examine the main indicators of centrality and the effects associated with such positioning.

INDICATORS OF CENTRALITY AND POSITIONING IN SOCIAL NETWORKS

Players in central positions tend to be the most powerful and influential as they establish multiple relationships that facilitate access to different resources. According to Wasserman and Faust (1994), better-connected players have more options to meet their needs (e.g., access to information sources) than players with fewer contacts. The most extreme case of centrality in a social network is represented by the graph of maximum centralization in the form of a star (Freeman, 1979). As we can see in Graph 1, the central black node is connected to the rest of the network players; however, the other players only establish contacts with the central node and are disconnected from each other. Although it is difficult to observe this type of structure in its pure state, in practice, networks may have similar patterns.

Intermediation is, along with degree centrality, one of the most used measures to explain the prominence of players in social networks (Freeman, 1979; Wasserman & Faust, 1994). However, both indicators operate differently. According to Freeman (1979), intermediation is the degree to which a player is located on the shortest path (geodetic distance) that exists between two players. The power of players with high intermediation is defined by their ability to control communication flows.

As we can see in Graph 2, the player with the greatest intermediation represented in black (G), despite not being the one with the most contacts, is the most outstanding player. This occurs because the information must pass by G to reach any of the two groups that make up the network. In this case, the G node is the one with the greatest intermediation capacity and, therefore, is the most influential, even though other players, such as node A, have more connections and have a higher degree of centrality.

Graph 1. **Maximum centralization graph, identifying the most central node in black**
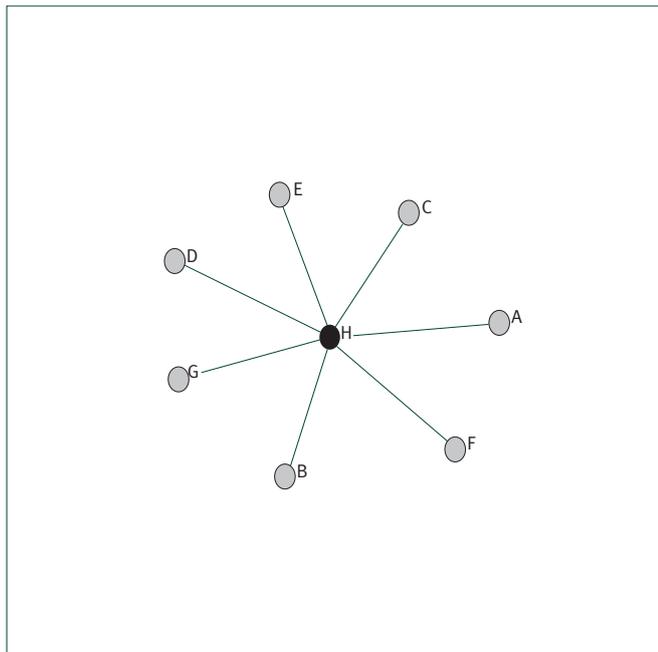
Graph 2. **Intermediation illustration, representing the player with the greatest intermediation in black**
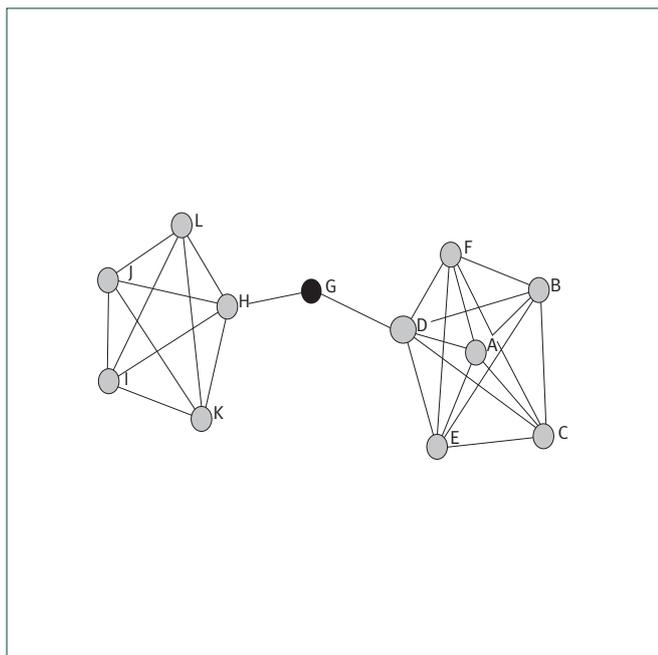
As can be seen in Graphs 1 and 2, visualization is a tool that can be used to understand the processes that influence the positioning of the players (Freeman, 2000; Brandes, Kenis, &

Raab, 2005). The better-connected actors occupy central positions, while players with fewer connections tend to be located on the periphery. The visual representation, combined with statistical procedures, allow us to identify the players who occupy positions of centrality and intermediation.

Current study

The research we hereby present is part of a study exploring multiple relationships between companies dedicated to the creation and representation of cultural products in Andalusia (Spain). One of the purposes of this research is to increase knowledge of the factors that predict the establishment of partnerships in the cultural sector. This information is relevant insofar as the characteristics of these partnerships define both the evolution of the sector and the protocols that the public administrations put into operation to manage these types of inter-organizational structures (Lecy, Mergel, & Schmitz, 2014). To this end, various types of relationships were analyzed, ranging from the mere recognition of the organization to joint participation in projects. In addition, different organizational indicators related to the internal functioning, the background, the trajectory in the sector, and the characteristics of the entities were examined. The universe of the population is formed by the organizations registered in an official census of the Center of Documentation of the Performing Arts of Andalusia. The registration in the mentioned registry is not obligatory to develop economic activity within the sector; nevertheless, it is necessary to be able to accede to public subsidies coming from the Andalusian Government. Therefore, while there are likely to be active and unregistered performing arts organizations, considering that public representational channels are the main source of income for cultural organizations, it is likely that in the census most of the organizations that develop their activity in Andalusia are registered, and that the entities external to this census are not representative. Most of the evaluated organizations were constituted from the year 2000, however there are organizations that have a longer trajectory. A quota sampling was carried out to reach a minimum representation of 50% of the companies registered in all the provinces of Andalusia.

This research deepens the knowledge of a subsector of the Andalusian cultural industry, integrated by organizations specifically dedicated to dance and theater in Andalusia. The cultural industry is considered a strategic sector because of its contribution to the GDP and its ability to generate employment. In Andalusia, the cultural industry has created more than 100,000 direct jobs and contributes 4.2 billion euros to the regional GDP

(Sánchez & Vega, 2011). However, the cultural sector is extremely diverse and includes industries as diverse as record labels and television, so it is necessary to examine each subsector of activity in a different way.

This research is close to a sector that so far has received little attention from the scientific community, despite the fact that the production of cultural goods and services is considered of high added value and its demand is on the rise. Therefore, it is necessary to know how to structure the network of organizations engaged in the production of cultural goods, such as dance and theater, in order to determine the factors that facilitate the collaboration and joint production of cultural goods and services. A deep knowledge of this sector is necessary to strengthen the structure of the coalitions that form these companies and, at the same time, to preserve the employment and the wealth that derive from the cultural production. The objectives of the research are: (1) to describe the structural properties of the inter-organizational networks formed by the groups of the performing arts of Andalusia; (2) to show whether the perception of similarity (i.e., perceived homophily) and the projection of future relationships determine the decision to establish contacts in the future; and (3) to evaluate the impact of organizational characteristics on the positioning of companies in the evaluated networks.

METHOD

Characteristics of organizations

The sample is made up of organizations dedicated to dance and theater in Andalusia. In all, we have examined 75.6% of registered organizations. Around 50% of dance and theater companies are concentrated in the province of Seville, followed by Malaga (18%) and Granada (16%), with a smaller presence in the rest of the Andalusian provinces. The majority (80%) are small enterprises with fewer than ten employees and high staff turnover. The organizations have been operating for an average of 9.8 years in the sector (DT = 8.52), they carry out approximately 45 events a year (DT = 67), and annually invoice 139,238 euros (DT = 284,188).

Participants' characteristics

A worker was interviewed in each organization. The interviewees occupy positions of responsibility in the organization chart, and 85% of respondents are directors, managers, or distributors of companies, while 48.4% of the interviewees are women and 51.6% are men. The respondents have a mean age of 39 years (SD = 8.06) and were born mostly between 1965 and 1981. Interviewees have been working in the company for 8.4 years (DT = 8.6), have an average work experience of 18.9 years (DT = 8.9) and receive an annual remuneration of € 12,206 (DT = 10,588).

Procedure

Relational data were obtained through a sociocentric questionnaire that explored different relationships among the 32 organizations represented in the research. We listed participants with the organizations listed in the census, and then asked them to indicate which of the organizations they had recent (e.g., "Indicates the organizations with which you have had formal contacts in the last year") or possible (e.g., "Mention the organizations with which you believe there is a possibility of establishing contacts in the future") contact with. Participants could assess the intensity of the relationship in terms of contact frequency. Once the relational data were obtained, we created an adjacency matrix for each type of relationship with the Ucinet 6.3 software (Borgatti, Everett, & Freeman, 2002). We used said program to calculate the measures of centrality and to carry out the statistical analyses corresponding to the second objective. We visualized networks with the Visone software (Baur et al., 2002), an application designed to represent sociocentric networks.

After processing the relational data and obtaining the visualizations of the networks, we held a discussion group with a selection of organization representatives to investigate the factors that affect the occupation of central and peripheral positions in each of the networks, and to understand the implications that arise from occupying these positions. To do this, we apply a technique known as visual feedback that consists of: (a) showing the group the different networks in which their organizations participate; (b) letting the interviewees try to explain the elements that condition the positioning of the companies in the network; and (c) finally, consensually establish which of these elements best explain the structural configuration of the examined networks. Different studies show the validity of the qualitative contrast to interpret relational data (Hollstein & Domínguez, 2012).

To reach the first objective, we calculate the measures of centrality (degree centrality and intermediation) and cohesion (density, degree centralization, and reciprocity). In the second objective, we apply a multiple regression analysis based on the quadratic assignment procedure (Krackhardt, 1987; Worrell, Wasko, & Johnston, 2013). This technique allows for the

comparison of matrices by using a non-parametric permutation test among the dyads that compose the network (Krackhardt, 1988). We used a technique named double semi-partialling (DSP) that allows for a better adjustment of the regression model in analysis at the dyadic level. This analysis is advisable when there are high levels of collinearity and self-correlation between the variables (Dekker, Krackhardt, & Snijders, 2007, page 572).

Exhibit 1. **Description of measures of centrality, cohesion, and attributes of organizations**

Indicator type	Name	Description	Formula
Cohesion measures	Density	It indicates the proportion of contacts that take place in a network in relation to the total of possible links. The density is expressed as a percentage of effective links on the total number of possible links.	One divides the number of links, *L*, by the number of possible arcs $g\ (g{-}1)$: $\Delta = \dfrac{L}{g(g-1)}$
	Degree centralization (Freeman, 1979, p. 228)	It indicates the degree (also expressed in percentage) in which the relationships that occur in a social network are concentrated in a specific group of players, comparing the real structure with the ideal structure in the form of a star (Freeman, 1979).	n = Number of points $\\$ $C_X(p_i)$ = Average centrality of points $\\$ $C_X(p^*)$ = Higher $C_X(p_i)$ = value for any point in the network $\\$ Max. $\sum_{i=1}^{n}[c_x(p^*)-C_X(p_i)]$ = The maximum possible sum of the differences in the center point of a graph with M points. $\\$ $c_x = \dfrac{\sum_{i=1}^{n}[C_x(p^*)-C_X(p_i)]}{\max\sum_{i=1}^{n}[C_x(p^*)-C_X(p_i)]}$
	Reciprocity	It shows the degree to which the bonds issued are returned to the issuers. As in the case of centralization and density, it is expressed as a percentage.	Considering that v and w are two nodes of a binary network that form a dyad, the reciprocal relationship is considered when the link between (v,w) is equivalent to the relation (v,w) $\\$ As noted by Cheng, Romero, Meeder, and Kleinberg (2011, p. 51), this expression reflects symmetry and is valid for dichotomous networks

Exhibit 1. **Description of measures of centrality, cohesion, and attributes of organizations**   (continuation)

Indicator type	Name	Description	Formula
Centrality measures	Degree centrality	Composite measure that shows the times that a player has nominated (output degrees) or has been nominated (input degrees) by the other players in the network.	$d(n_i)$ = Nº of nodes with which it is connected. g = nº of network nodes (size). $C_D(n_i) = d(n_i) = \sum_j x_{ij} = \sum_j x_{ji},$ Standardized formula: $C_D(n_i) = \dfrac{d(n_i)}{g-1}$
	Intermediation	Examine the extent to which a player is situated on the shortest path (geodetic distance) between two players or sets of players in a network.	G_{jk} = nº of geodetic paths that join j and k. $G_{jk}(n_i)$ = nº of geodetic paths between j and k that pass by i. $C_B(ni) = \sum_{j<k} g_{jk(ni)}/g_{jk}$ Standardized formula: $C'_B(ni) = \dfrac{C_B(ni)}{[(g-1)(g-2)/2]}$
Attributes	Seniority	Average number of years that the organization has been operating in the sector.	Not applicable
	Activity volume	Average number of events and artistic productions that the organization carries out over a year.	Not applicable

We calculated the centrality measures and export the information to the SPSS® 20.0 program to perform hierarchical regression analyses using the stepwise procedure (Cohen, Cohen, West, & Aiken, 2003). In each regression model, the measures of centrality of the network of joint participation in projects and the network of informal contacts were used as dependent variables, and the mean of the organization's years of service in the sector and its average volume of activity and billing were used as independent variables. The selection of these variables is based on the literature that shows that individual indicators are antecedents that can determine the positioning and results of organizations in strategic partnerships (Ebers, 1999; Zajocs & Edwards, 2006). We used the visualization of graphs and the representation of attributes of the organizations to determine the influence exerted by the antecedents and characteristics of the companies analyzed in their positioning in the inter-organizational network. Exhibit 1 describes the indicators.

RESULTS

Table 2 shows the values of the indicators of centrality and cohesion in the four examined inter-organizational networks. The following are the centrality and cohesion indicators of the networks: (a) collaboration; (b) informal contacts; (c) perception of connection; and (d) the future possibility of contacts, which will be used in the regression analysis corresponding to objectives 2 and 3.

Table 1. **Results of the cohesion measures for the four networks studied**

Network type	Cohesion measures		
	Density (%)	Degree centralization (%)	Reciprocity (%)
Collaboration network	17.34	47.51	21.31
Network of informal contacts	41.09	36.43	25.13
Network connection perception	24.39	29.13	26.62
Network of possibility of contacts	28.51	36.18	13.78

Table 1 indicates that the density of networks range from a moderate 17.34% of the collaboration network and a high value of 41.09% of the network of informal contacts. Organizations often have informal contacts, but such links do not seem to be translated into joint artistic projects. If we pay attention to the density value in the networks of perception of connection and the future possibility of contacts, we will find that they present similar values. This may be due to the fact that both types of links are related, as there is a general tendency to establish relationships with players with whom common characteristics are perceived. This phenomenon called "homophily," determines, according to McPherson, Smith-Lovin, and Cook (2001) the processes of selection and influence that condition the formation and co-evolving of social networks.

Another of the analyzed cohesion indicators is degree centralization. This measure shows the percentage in which the relationships that take place in a network are concentrated in a subset of players. This indicator ranges from 29.13% of the connection perception network to 47.51% of the collaboration network. The value of this indicator shows us that there is a group of organizations that are more active in the establishment of contacts, while the rest of the organizations maintain a passive contact strategy. This phenomenon is identified in Graph 4, in which we represent the collaboration network identifying the central and peripheral structure, indicating the central nodes in black and the peripheral nodes in gray. Finally, we examine the value of reciprocity in the four selected networks. Reciprocity indicates the degree of consolidation of relationships and the level of consensus in defining the existence or absence of links (Granovetter, 1985; Baker, 2014). The greater the reciprocity, the greater the consolidation of the analyzed relations. The four scanned networks show values ranging from 26.62% of the connection perception network to 13.78% of the future contact potential network. These indicators show a moderate level of reciprocity in the different relations.

In order to answer the second objective, we checked whether the networks of perception of similarity and future possibility of contacts influence the network of informal relations maintenance. The relevance of raising the second objective lies in identifying the role of elements such as the perception of affinity and intentionality in establishing relationships with other organizations in the sector (Baker, 2014). In Table 2, we present the multiple regression analyses based on the quadratic assignment procedure (Krackhardt, 1987; Worrell et al., 2013), following the DSP model proposed by Dekker et al. (2007).

Table 2 indicates that there is a dependency relationship between the networks of affinity perception and future possibility of contacts and the network of informal contacts. The summary of the regression model shows that both dependent variables together account for 15% of the variance of the dependent variable at the highest level of significance. This indicates that certain links, in this case intentional or perceptive, have a significant influence on the establishment of informal contacts. This implies that organizations tend to establish partnerships with entities with which they perceive that there is an affinity for their objectives and their idiosyncrasies. Therefore, in the inter-organizational partnerships in the performing arts sector, the same homophilic process is produced by which perceived players prefer to establish contacts (McPherson et al., 2001).

Table 2. Multiple regression following the procedure of quadratic assignment, taking as independent the networks of perception of connection and the network of future possibility of contacts and as dependent the network of informal contacts

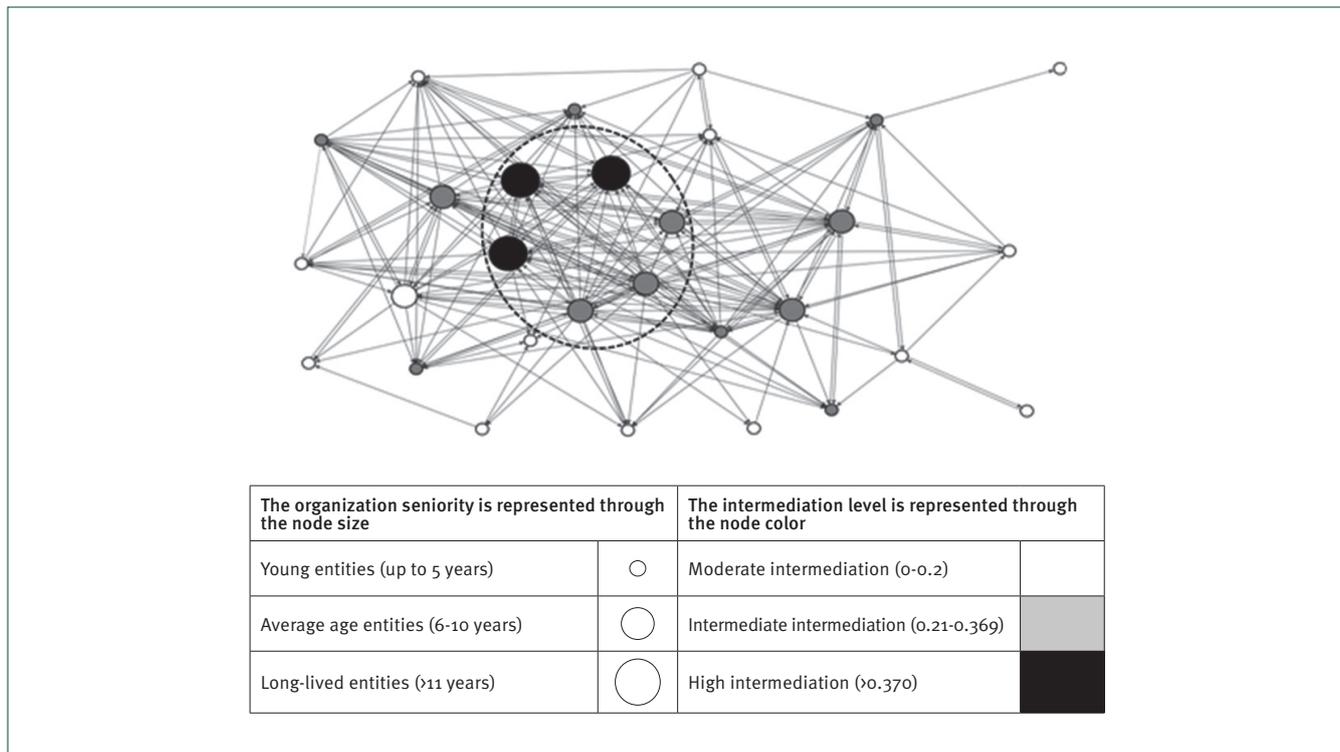| Independent variables		Dependent variable		
		Network of informal contacts		
		Error est.	β	p
Network of connection perception		0.0693	0.3255	0.0005
Network of future possibility of contacts		0.0797	0.1304	0.0415
R	0.154**			
ΔR^2	0.153**			
No. of permutations	992			

Note: ** $p < 0,0000$

This points to the importance of background and reputation to identify preferred organizations, and for engaging in real contacts beyond the strict perception of affinity. Lange, Lee, and Dai (2011) argue that in assessing an organization's reputation, three dimensions come into play: (a) familiarity with the organization; (b) beliefs about what is expected of the organization in the future; and (c) factors that presage a favorable long-term development of the organization. In practice, we observe that the perception of similarity develops a key function in the selection of organizations that form the framework of social relations of an entity. Indeed, the only information available to managers in the formation of strategic partnerships—prior to the establishment of informal contacts—are often external references or the reputation of the company. This seems to reflect that reputation is one of the factors that defines the intention to maintain contact with other organizations in the network, beyond other factors such as the reduction of costs, the acquisition of competitive advantages, or the avoidance of uncertainty (Granovetter, 1985; Provan et al., 2009).

The third research objective is to determine the relationship between the characteristics and antecedents of the organization and the influence they can exert on different types of relationships. To do this, we first present the correlations between the study variables in Table 3 and, secondly, we perform hierarchical regression analyses (Cohen et al., 2003) using the centrality measures of the players as a dependent variable and the characteristics of the organizations (seniority, volume of activity, and billing) as independent variables.

Graph 3. **Network for participation in projects indicating the seniority in the sector and the degree of intermediation**

The organization seniority is represented through the node size		The intermediation level is represented through the node color	
Young entities (up to 5 years)	○	Moderate intermediation (0-0.2)	
Average age entities (6-10 years)	◯	Intermediate intermediation (0.21-0.369)	(gray)
Long-lived entities (>11 years)	◯	High intermediation (>0.370)	(black)

Graph 4. **Network for participation in projects indicating the volume of activity and the degree of intermediation**

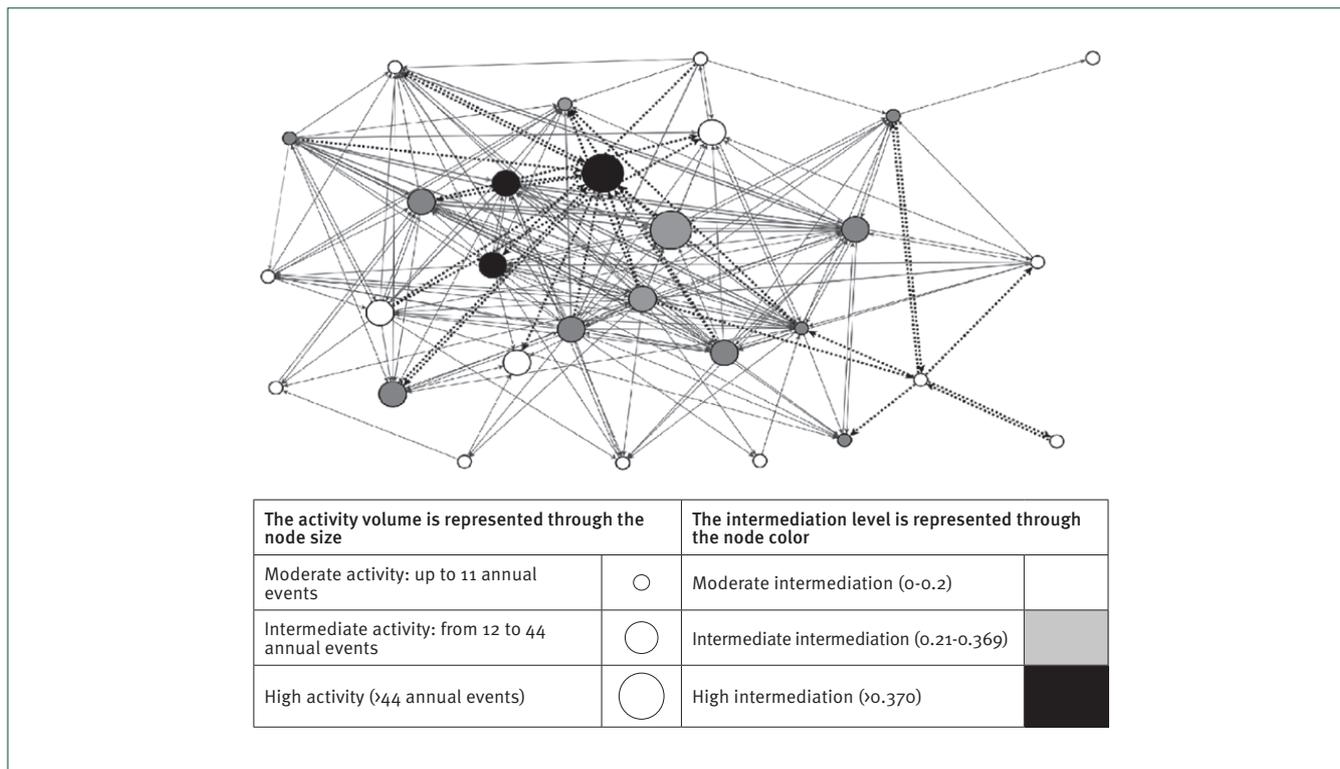| The activity volume is represented through the node size		The intermediation level is represented through the node color	
Moderate activity: up to 11 annual events	○	Moderate intermediation (0-0.2)	
Intermediate activity: from 12 to 44 annual events	◯	Intermediate intermediation (0.21-0.369)	(gray)
High activity (>44 annual events)	◯	High intermediation (>0.370)	(black)

Table 3. **Correlations between the variables used in the regression analysis indicating the Pearson correlation coefficient**

Variables	1	2	3	4	5	6	7
1. Activity	-						
2. Billing	0.438*	-					
3. Antiquity	0.562**	0.155	-				
4. Collaboration network centrality	0.182	0.030	0.267	-			
5. Collaboration network intermediation	0.526**	0.097	0.404*	0.632**	-		
6. Informal contacts network centrality	0.046	0.074	0.168	0.734**	0.444*	-	
7. Informal contacts network intermediation	0.019	0.055	0.111	0.466**	0.369*	0.520**	-

Note: ** $p < 0,001$ * $p < 0,05$

As can be seen in Table 3, the organizational attributes are intensely connected. The level of activity of the organization is positively related to the turnover and the seniority of the organization in the sector. The organizations that have a long history are those that have managed to establish themselves with greater guarantee in the artistic circuits of representation and have managed to acquire a position of reference in the sector. Long-lived organizations have greater opportunities to publicize their artistic creations with advantages to access markets and the general public. However, the centrality indicators present a modest number of significant correlations in relation to the attributes of the organization. The only indicator of centrality that presents significant correlations is the intermediation of the collaboration network. This result is in line with the proposal of Zajocs and Edwards (2006), which indicates that one of the factors that determines the success of organizations in forming strategic partnerships is seniority in the sector.

To test the third objective of the study, we performed four hierarchical regression models in which organizational attributes (volume of activity, level of turnover, and age in the sector) act as independent variables, and centrality and intermediation in project participation networks and the network of informal contacts, as dependent variables. Table 4 shows the summaries of the four regression models.

Table 4. **Coefficients and summaries of regression models**

Step	Independ. Var.	Dependent variables											
		Collaboration networks						Informal contacts network					
		Centrality (Model 1)			Intermediation (Model 2)			Centrality (Model 3)			Intermediation (Model 4)		
		t	β	p	t	B	p	t	β	p	t	β	p
1	Activity	0.997	0.18	0.32	3.32	0.52	0.00	0.24	.046	0.80	0.10	0.019	0.917
2	Billing	1.17	-0.13	0.51	-0.93	-0.16	0.35	-0.55	-0.11	0.58	-0.37	-0.078	0.711
3	Seniority	1.51	0.27	0.14	0.82	0.15	0.41	0.85	.196	0.41	0.59	0.138	0.557
Model		R²		ΔR²		F			p			DW	
1		0.048		-0.020		0.705			0.503			0.996	
2		0.299		0.248		5.958			0.007			1.345	
3		0.013		-0.057		0.186			0.831			0.916	
4		0.005		-0.066		0.075			0.928			2.519	

Note: DW= Durbin-Watson statistic.

The second regression model is the only one with significant values. The model summary shows that the independent variables (activity level, turnover volume, and age in the sector) together account for 24% of the variance of the criterion variable. The Durbin-Watson statistic indicates that both the observations of the variables and the residuals are independent. In the remaining three models, the regression equation yields non-significant values. This result reflects that the independent variables, in particular the level of activity and previous experience in the sector, make it easier for cultural companies to occupy intermediation positions in the network of joint participation in projects. However, these effects do not seem to affect the level of centrality of entities in both types of relationships, nor in the degree of intermediation in the network of informal contacts.

This differential effect of the organizational attributes can be explained if we examine the two relations analyzed in depth. Informal contacts refer us to a type of relationship in which there is no need for agreement or a minimum level of commitment between the parties. This type of relationship may reflect the disclosure of own shows, personal closeness, or repeated coincidence in specialized events of the sector. Therefore, it is possible that the attributes of the organization may not have such a marked effect on the positioning of organizations in this type of relationship when compared to the impact they have on the positioning in the network of joint participation in projects. This type of relationship describes a link in which the parties have collaborated in joint initiatives, so it is possible that a long career and them having developed a large number of shows will make these organizations more selective when it comes to relating and refining their contacts, based on previous experiences of collaboration. Thereby, the trajectory and the level of activity would allow the entities to make "selective screens" to occupy positions of intermediation, since they are able to benefit from this positioning. In other words, these organizations can sacrifice the occupation of central positions, that is, maintain many contacts, with the objective of preserving strategic positions that allow them to be in contact with multiple groups, accessing resources in conditions of competitive advantages (Uzzi & Spiro, 2005; Burt & Soda, 2017).

To visualize this process, we will use the network of joint collaboration in projects, representing the degree of intermediation through the color of the node and the seniority in the sector through the size of the node. Graph 3 indicates that organizations with medium and high intermediation, represented in black and gray, mainly occupy central positions in the graph, whereas the organizations represented in white for the most part occupy peripheral positions. Larger organizations correspond to larger organizations and tend to occupy central positions.

We have delimited, through a dashed line, the entities that form the central nucleus of the network, showing that the companies that have spent the most time operating in the sector correspond to those that play the role of broker in the network of joint participation in projects. The visualization allows us to verify how the positioning of an organization in the graph is related to its organizational attributes, showing the incidence of these characteristics in the structural positioning of the organization.

In Graph 4, we have again represented the collaboration network, but this time we represented, through the size of the node, the volume of activity, and through color, the level of intermediation, as the degree centrality does not show covariations in relation to organizational attributes. There is a tendency for more active organizations to locate themselves in central positions, while smaller organizations tend to occupy positions outside the central core of the network.

To illustrate these results, we have represented, with a dashed line of discontinuous points, the links that maintain a central company and another one located in the periphery. We can observe the extensive number of contacts maintained by the central node and these contacts are distributed between central and peripheral organizations. For its part, the peripheral entity maintains a modest number of contacts that are located, in most cases, in the external zone of the network.

DISCUSSION

We have analyzed an inter-organizational network composed of dance and theater companies that develop their activity in Andalusia, focusing on the structural determinants and the organizational attributes that can influence the process of forming strategic partnerships. We used multiple regressions by following the procedure of quadratic assignment (Krackhardt, 1987, 1988, Dekker et al., 2007, Worrell et al., 2013) to determine to what extent being immersed in certain types of dyadic relationships, specifically the perception of having characteristics in common (homophily) and the belief of being able to maintain contacts in the future, affect the establishment of informal contacts. The results show that both types of relationships partially explain the decision to establish informal contacts. However, homophily has a greater explanatory power which seems to indicate that those responsible for the organizations see greater possibilities of maintaining informal contacts with organizations that are perceived as similar. This decision can be explained because

the circuits of representation are segmented according to the different disciplines (contemporary dance, theater, classical ballet etc.), so that companies can see greater opportunities for collaboration with other entities that develop activities within the same artistic current.

However, this evidence can also reveal an excessive inbreeding when establishing partnerships which can hinder the generation of creative products with added value. This statement is based on the work that shows that being in contact with organizations that develop different creative styles is a crucial element in the creation of innovations (Uzzi & Spiro, 2005). These findings should be considered by the designers of cultural policies so that they facilitate the creation of circuits of representation in which the different artistic branches of the cultural panorama converge in Andalusia. At the same time, we must consider that the perception of similarity (homophily) constitutes a trigger for relationships. Various proposals in sectors as diverse as ecology and the one formed by technology-based companies show that the decision to establish contacts with other organizations is often facilitated when companies in the sector perceive that they have common characteristics and similar objectives (Calanni, Siddiki, Weible, & Leach, 2015; Capone & Lazzeretti, 2017).

Although initially the affinity perception allows one to predict the establishment of informal contacts, these types of contacts usually become the appropriate scenario to define collaborative projects of greater impact. The main specialized events in the performing arts sector take place in informal contexts, among which are the Theater Festival at the Port of Santa María and the South and Mercartes Theater Festival which are spaces for informal exchange. In spite of this, a significant portion of the agreements between the sector's commercial agents take place here. Therefore, in this specific context, it is difficult for relationships to flow, as Gulati (1995) proposes, from initial formalism to trust based on the accumulation of positive transactions. In the performing arts sector, it makes sense to think that the decision to establish relationships with an organization is motivated by: (a) the reputation of the organization; (b) the perception of affinity; and (c) the information available about the objectives and the types of activities carried out by the entity.

The literature focused on the analysis of inter-organizational networks indicates that organizations tend to be part of these types of structures and select their contacts within them based on criteria related to reducing transaction costs or improving their situation with respect to direct competitors (Uzzi, 1997; Ma et al., 2009; Jansen, 2017). However, this research shows that there are other types of determinants and organizational backgrounds that influence the positioning of organizations in the sector. We have

verified, through hierarchical regression analysis, that the volume of activity and the time taken by the entities are related to the role of brokers performed by some companies in the collaborative network (in joint projects).

This result implies that the trajectory of the entity in the sector constitutes a key indicator in the possibilities of acquiring prominent positions in the cultural sector, with the organization with greater intermediation having more options to influence the rest of the network. This result is similar to that identified in different organizational contexts, such as that of manufacturing companies and companies that provide health services (Uzzi, 1997, Provan et al., 2009). Therefore, it seems that reputation is a key factor that explains the establishment of links in inter-organizational networks regardless of the activity sector. Organizations that have more experience have greater opportunities to get to know their competitors and carry out joint productions. In practice, this experience together with the level of activity are important factors when selecting organizations with which to establish relationships. The entities with the longest trajectory are identified with those that have managed to acquire a (positive) reputation over the years, reaching stable positions in the representation circuits. This is in line with the work of Granovetter (1985) and Provan et al. (2009) in which it is shown that reputation influences the decision to establish strategic partnerships.

On the other hand, the very characteristics of the performing arts sector in Andalusia, among which are (a) the small number of organizations professionally dedicated to this branch of activity, (b) the geographical concentration of institutions and cultural initiatives, and (c) the high level of dependence on Public Administration, may also be playing a key role in the structuring of the network (Ramos-Vidal & Maya-Jariego, 2013). These processes are related to the background of the organization to the extent that a long trajectory offers opportunities to ascertain the functioning of the bureaucratic and administrative system necessary to obtain subsidies. Older organizations are placed in a preferential position to access public representation circuits that produce greater benefits and provide greater stability to companies in the sector. This fact highlights the crucial role played by informal relationships in understanding the functioning of small businesses and the factors that motivate organizations to establish relationships with other companies (Martin-Rios & Erhardt, 2017). These results show that a large part of the decisions made in the business world, which ultimately define business strategy, arise and crystallize in informal interaction contexts, such as the specialized events just mentioned. This information should be considered by the institutional heads of cultural policies in order to understand that, beyond the role

that these spaces fulfill as a means of cultural diffusion, there are contacts that end up defining the direction that the sector takes in relation to the type of cultural events that take place and to the public and private circuits in which cultural creations are represented.

It is necessary to point out the limitations of the study to understand the actual scope of the results. The characteristics of the performing arts sector in Andalusia make it difficult to extrapolate the results to other business contexts without previously taking into account these particularities. On the other hand, the influence of public policies on the distribution of subsidies and the organization of circuits of representation may be influencing the structuring of the collective.

It would be desirable to increase the number of organizations in order to obtain a more complete vision of the structure of the inter-organizational network and to extend the research to other subsectors of activity, such as groups dedicated to flamenco singing, in order to have a comparative base. Although it is true that the coverage was broad, given the fact that we reached 75% of the organizations in Andalusia., during the process of obtaining information we found out that some organizations included in the census had ceased their activity while some informants identified cultural groups that did not appear in the census. As suggested by Knoke and Yang (2008), it would be advisable to combine different strategies, such as interviewing key informants and using different name generators, to better delimit the size and composition of the inter-organizational network.

To summarize, in this paper we focused on analyzing multiple relationships that denote positive links. It is necessary to examine the negative relationships (e.g., unfair competition, plagiarism or negative gossips), as the evaluation of this type of relationship, despite posing problems of measurement and interpretation, has begun to draw the attention of experts in SNA (namely, Everett & Borgatti, 2014). Labianca and Brass (2006) have also pointed out that negative links display a great capacity to determine the behavior of players inside social networks.

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