Socio-material network analysis: A mixed method study of five European artistic collectives

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ABSTRACT

In this paper, I argue that we can better understand the relationship between social structure and materiality by combining qualitative analysis of practices in shared physical space with statistical analysis. Drawing on the two-mode approach, I treat social and material structures together with the relationship between them as a two-level socio-material network. In a mixed method study, formalized ethnographic data on such networks in five European artistic collectives are subjected to multilevel exponential random graph modelling. It sheds light on how different kinds of interpersonal ties condition the engagement of individuals with similar materiality over time.

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1. Introduction

Sociologists are well aware of the role materiality plays in the reproduction of the social order. By creating and using physical objects, social actors draw on the corporeality of the material to reinforce the social with its embodied durability, channel symbolic power, represent socio-cognitive constructs, communicate and reproduce standards for social interaction (Bourdieu, 1984, 1990, 1996; Luhmann, 2000; Mead, 1912). However, little is known about how interpersonal ties affect engagement of individuals with shared materiality in their everyday practice. Understanding this role could shed light on the relationship between social structure and materiality at the micro level.

Up until now, network analysis that traditionally examines concrete structures of social ties, paradoxically, has not considered how these affect the ways individuals utilize physical objects, which are, at least, no less concrete. Qualitative micro-perspectives have covered more ground in empirical investigation of materiality (Berns, 2016; Craig, 2011; Griswold et al., 2013; Jarness, 2015; Maisonneuve, 2001; Newton-Francis and Young, 2015). Using ethnographic data they argued that the relations between material things comprise the texture of materiality just like interpersonal ties constitute the texture of the social and hence should not be neglected, and even that materiality has its own structuring logic (Callon et al., 1986; Latour, 2005). For example, Maisonneuve (2001) analyzes how in the 1920–30s, gramophones, records and catalogues connected by new practices of collecting and listening changed the appreciation of music and created new markets.

To address the relationship between two self-consistent orders, such as social network ties and the structure of materiality, the lens of duality perspective (Breiger, 1974; Simmel, 1955) is useful. Applied in various contexts (Breiger and Pattison, 1986; Martin, 2000; Mohr, 2000; Mohr and Duquenne, 1997; Mohr and Neely, 2009), 'dual' thinking considers pairs of orders jointly, as co-constituting but also self-organizing. The most broadly known application of the duality thinking is, perhaps, the culture and structure duality (Breiger, 2000; Martin, 2000; Mohr and Neely, 2009; Mohr and Rawlings, 2010; Schultz and Breiger, 2010), that "involves recognizing that neither culture nor social structure, system of meaning nor mode of practice, should be privileged in the analysis. Rather these multiple orders of social life need to be given equal weight and each should be seen as being constituted by its embeddedness within the other." (Mohr, 2000).

Given that the distinction between the social and the physical orders is no less explicit, but at the same time the two orders are known as interrelated, it makes perfect sense to extend dual thinking to study the relations between materiality and social structure. Schweizer (1993) has already applied the dual logic to capture the interplay between materiality and social structure in urban communities of French Polynesia, hunter–gatherers in Zaire, and peasants in rural Java. By examining the dual relationship between material possessions owned by community members and their social ranking, he found that the ordering of one was interdependent with the ordering of the other. More recently, Mohr and White (2008) drew on Schweizer's work to analyze the institutional stability of Indian caste systems and found this stability to be based on the dual ordering of social networks and cultural values realized through transactions involving food, everyday items, water, garbage, etc.

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Methodologically, the dual perspective is most frequently operationalized using the two-mode approach, introduced by Breiger (1974), and its generalization (Fararo and Doreian, 1984). Successful in the studies of dualities (Breiger, 2000; Martin, 2000; Mohr and Duquenne, 1997; Mohr and Neely, 2009), and already applied to link individuals and objects (Mohr and White, 2008; Schweizer, 1993), this approach can be used to represent the duality of the social and the material. Namely, the two-mode network of object usage connecting actors to objects captures the relationship between the two orders, represented by two one-mode networks: social ties on the one hand and links between physical objects on the other. We can then analyze 'socio-material networks' (see Fig. 1) that include the three types of relations: (1) social ties, (2) links between material objects as they are combined and collocated in the physical space, thus comprising the structure of materiality, and (3) links between actors and objects they use throughout their material activities.

Such an extension allows a formal representation of specific network patterns showing how socially connected actors utilize objects and, this way, jointly engage with material structure. For example, when two collaborators use certain tools to accomplish their work tasks we can view it as a two-level cycle, where nodes are two objects and two actors, two edges are object usages, one edge is a collaboration tie and one edge represents an association between tools normally used in the course of the work. Examining the relative importance of such patterns enables insight into the specific principles, according to which social ties affect joint engagement of individuals with material structure as they use physical objects in everyday practice.

This can be done statistically – if we (technically) approach socio-material networks as two-level networks,[2] hence treating the social and the material as distinct orders interconnected by the two mode object usage links. Then, it is possible to apply such a state-of-the-art technique of network analysis as multilevel exponential random graph modelling (MERGM) (Wang, 2013; Wang et al., 2013). MERGMs enable addressing dually co-constitutive orders with the statistical power that was not available before and inquire about particular principles of how social ties affect engagement with shared materiality.

Because the relation between social structure and materiality is not yet transparent, this paper develops a 'full-scale' mixed method approach, both data collection and analysis oscillating between the qualitative and the quantitative (see Fuhse and Mützel, 2011; Godart and Mears, 2009). It starts with gathering a mixed set of data that includes both social network survey data and ethnographic data, such as interviews and visual observations. This mixed data is used to produce the two-level networks subjected to statistical modelling. And then, the modelling results are contextualized using the ethnographic data.

The present paper aims to test the outlined approach and thus open up a research avenue rather than to draw conclusions. With this in mind, I focus my empirical inquiry on artistic collectives. Creatives have been the subject of network analysis before (Basov et al., 2016; Comunian, 2011; Crossley, 2009; De Nooy, 1999, 2002; McAndrew and Everett, 2015). Although the relation between the social and the material is clearly not limited to small groups of visual artists sharing spaces which I analyze, such a setting allows a close ethnographic examination of how social structure molds materiality within a reasonable amount of resources. Firstly, the role of space and materiality for artists, despite the technological changes of the 20th century in communication and transportation,
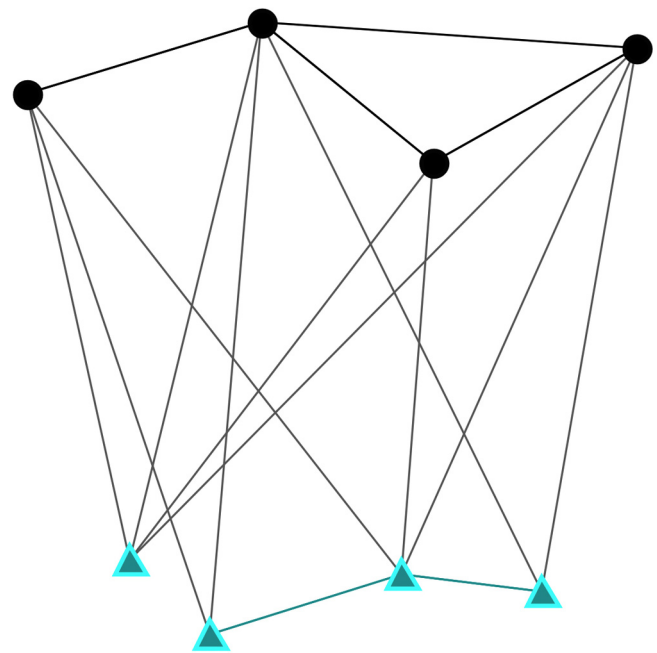

Fig. 1. A socio-material network.[1]
Note: Circles: actors. Triangles: objects. Black lines: social ties. Cyan lines: material links. Grey lines: usages of objects.

is widely recognized (Carlozzi et al., 1995; Griswold et al., 2013; Oberlin and Gieryn, 2015; Peter, 2009) and we can expect artists to be explicit in their material activities. Secondly, in the artistic setting, the social and the material are not constrained much by the formal regulations as they are, for example, in organizations.

To induce generalizability of the findings, I use the data on five collectives of artists located in different European cities – Barcelona, Hamburg, London, Madrid, and St. Petersburg, which are embedded in different social and cultural contexts. Still, I realize that the given setting does not allow for broad conclusions to be made about the overall relationship between social and material structure.

The paper proceeds as follows. I start by presenting hypotheses on the basic principles of socio-material structuring, suitable for the purposes of illustrating the proposed approach. Then, I describe the empirical setting and the techniques of data collection and analysis. After that, results of the analysis are presented. I conclude with discussion of the results and an outlook on limitations and future prospects.

2. Principles of socio-material structuring

While the effect of materiality on interpersonal relations has been widely argued and empirically investigated by the qualitative approaches (Berns, 2016; Callon et al., 1986; Craig, 2011; Griswold et al., 2013; Latour, 2005), the seemingly obvious inverse dependency – the ways in which social ties draw on common materiality – still needs empirical inquiries. Since the material provides the social with a 'body', we need to understand how this embodiment happens. Hence, my hypotheses revolve around the question of how social ties affect engagement of individuals with similar materiality in a shared space over time.

Informed by the previous studies, I distinguish between two types of social ties: collaborations and emotional attachments. Whereas these two kinds of relations are not mutually exclusive (Balkundi and Harrison, 2006), interactions specific for them clearly differ, implying specific goals, relational frames, and expectations. Collaborations rather correspond to joint work and exchange of work-relevant information and advice, while emotional attach-

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[1] ORA NetScenes was used to produce all network plots (Carley et al., 2013).

[2] Note, however, that similarly to Brennecke and Rank (2017) while using this conventional label, I do not think of the social and the material as nested levels.