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Introduction

Network Perspectives – Content Meets Structure

Lydia Repke & Filip Agneessens

We often assume that people's behaviors, values, and beliefs are their individual choices. When we consider our own behavior, values, and beliefs, we are particularly tempted to assign quite a bit of agency to ourselves. For example, when we look at our decision to buy a specific product, we often think we make a rational and independent decision. In other cases, we might be inclined to explain a person's behavior and beliefs as the consequence of that person's characteristics, such as his or her age, personality, capacities, education, income, or occupation. For example, when we see people commit a crime, such as stealing, we might think of this as being the consequence of their own rational decision to commit that crime because - given their economic situation - the benefits outweigh the possible negative consequences of getting caught for that crime. Hence, we might explain their behavior to be the result of their situation. Alternatively, we might interpret their criminal behavior as being related to their personality ("they could not resist the temptation") or lack of ethics ("they do not know the differences between good and evil"). In sum, when we try to understand human behavior or beliefs, we might be tempted to either see these as the outcome of an individual's free choice or as the result of individual characteristics.

However, humans have a need for social contact (i.e., to interact with others; Crosier, Webster, & Dillon, 2012). This social compo-

nent offers a third type of explanation for why people behave in a specific way or why they tend to hold a specific belief. That is that their behavioral decisions and beliefs are linked to how they are connected to others. In the case of deciding whether to buy a product, we might purchase this product because our neighbors or friends have bought it. Similarly, when thinking of criminal behavior among adolescents, a feasible explanation could be that a person is "hanging out with the wrong crowd" (i.e., they are more inclined to commit crimes because their friends commit crimes). Hence, such an approach focuses on the social (network) relations that people hold. The core idea of this perspective is that social relations impact our behavior and shape our beliefs and views on life, while at the same time, we might be selective about who we form relationships with. For example, there is growing evidence that we tend to live in our own social bubble, surrounded by people with similar beliefs, especially on the Internet. That creates an echo chamber effect, which reinforces our own ideas and belief systems, and might even strengthen our dislike for people with different beliefs.

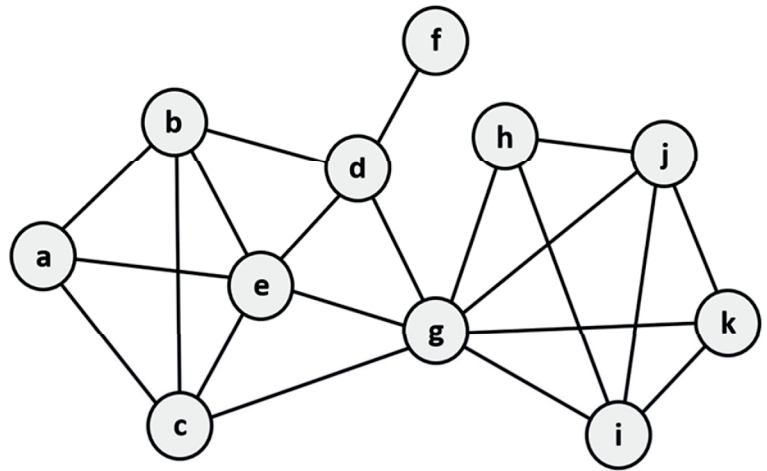
Such a relational perspective might not only be useful to explain individual behavior and beliefs but might also help explain how cooperation and coordination come about between people, organizations, or even nations. Since organizations and nations are made up of indi-

viduals, their coordinations can, in essence, be seen as complex aggregations of individual behavior. Hence, a social network analytical perspective might not only help explain individual behavior but also those of organizations and countries. Central to this third type of explanation is the idea of looking at the world like a social network. This *easy_social_sciences* issue consists of four papers that take up this idea and highlight different research areas from a social network perspective. However, before going deeper into how network analysis helps understand specific research topics, we first introduce some basic concepts and ideas about social network analysis.

A Social Network Perspective

Social network analysis has a long tradition, and this perspective can be traced back to classic sociologists, such as Georg Simmel and Emile Durkheim. In general, social networks describe the patterns of social relations between specific units, which are often referred to as *actors* (or using more technical terms, *nodes* or *vertices*). Figure 1 provides an example of a made-up network, where the actors are represented by circles, while the relationships are represented by lines (often referred to as *ties* or *edges*).

Figure 1 A Graphical Representation of a Network



These actors can be students in a classroom, employees in an organization, or people in a meeting or protest event. They could even be organizations, countries, animals, or tweets (see Table 1). In popular culture, the concept of social networks is often used to refer to online interactions, such as Instagram, Twitter, or Facebook. However, while these are interesting social networks to study, most social network analysis focuses on “in-person” networks. When focusing on people, these social relations can involve specific interactions, such as helping behavior, transmitting specific resources, asking advice, or gossiping about a third person. Still, they can also apply to negative behavior towards others, such as hindering or bullying another person. Besides interactions (i.e., behavior between people), social relations can also refer to other types of ties, which involve cognitive evaluations of

others (such as whether you can trust a person), affective ways of perceiving others (e.g., whether you like or dislike that person), or ways of describing your relation with another person (such as whether you consider a person a friend; Agneessens & Labianca, 2022).

One way to collect social network data is to look at a specifically delineated group of actors (e.g., all the children in a school class) and gather information on

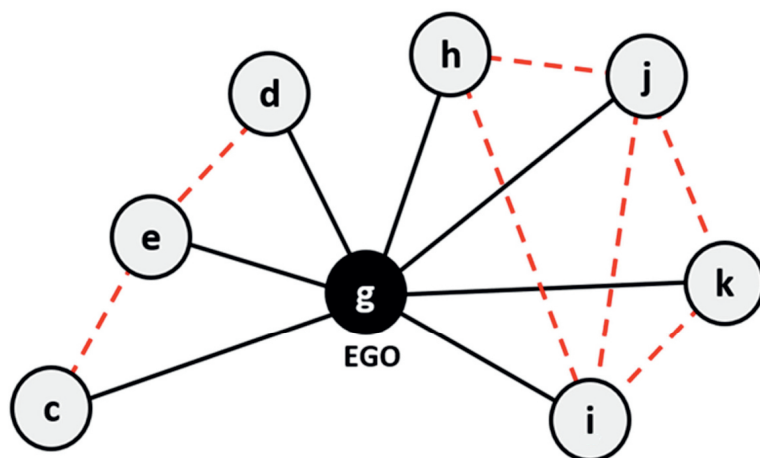
Table 1 Examples of Social Networks

Actors (nodes)	Social relation (Ties)	Context (a specific delineated boundary)
School children	Friendship Bullying	School class
Employees	Asking advice Gossiping about each other	An organization
Bonobos	Grooming each other Cooperative behavior	Troop
Organizations	Coordinating Competing	A sector or region
Countries	Trade Being enemies with each other	A continent or the world

the links between all these actors. In this case, we collect network data among a bounded set of actors (see Table 1). This is often referred to as a *complete network*. Some of the papers in this issue provide examples of complete network analysis. For instance, Gauthier and Bogdan (2021) discuss two cases focusing on interactions among relevant actors to arrive at collective decisions.

In other cases, we might not collect data among all people in a group but instead, select a set of actors and collect the direct connections for these actors. For example, we might ask a person (an ego) about his or her friends or specific interaction partners, and based on this information, build an ego network (see Figure 2, where we focus on ego (g)). Such an approach is particularly useful when you want to collect network information for a larger population of actors, such as all the people in Germany, and you are only interested in the direct connections ego has. In such a case, it is simply impossible to collect information about the links among the whole population of Germany. Instead, we would collect information from a random sample of people (egos) by asking them about their surrounding network (i.e., their relations with alters). We might also ask this sample of people to provide extra information on these alters, such as their gender, age, occupation, or even political views. In some cases, we might even ask people to indicate whether their contacts are connected with each other (the dotted lines among the alters of ego (g) in Figure 2). This is called an *ego-network approach* (McCarty, Lubbers, Vacca, & Molina, 2019), and it differs from a complete network approach in that we do not have network information beyond the direct connections around the selected egos (i.e., beyond their alters). Using an ego-network approach, we can then use this information to study, for example, whether the number of friends is related to the well-being of individuals. The two cases discussed by Repke et al. (2021) and the first case presented in Kriegl et al. (2021) in this issue are studies that rely on an ego-network approach.

Figure 2 A Graphical Representation of an Ego-Network for Person (g)



Note. Dotted lines represent ties among alters.

Content Meets Structure: The Benefits of a Social Network Perspective in Four Research Areas

Given the focus on social relations, we might be tempted to think that network analysts concentrate solely on structure among people. There is much to be said for simply studying a network's structure. For example, examining the network as a whole, we might observe that there are some cohesive or dense subgroups in this network (one on the left and one on the right; Figure 1). We might also notice that there is quite some clustering (i.e., closed triads) in this network. Further, we can also observe that node (g) is the only one connecting both subgroups, and so it plays an important role in linking both. This specific position in the network might provide this node with some important leverage since it means information between both groups would need to go through it. This is sometimes also referred to as brokerage or structural holes (Burt, 1992). Other aspects focusing on *network position* include how well connected or central a node is (e.g., how many people a node can reach directly or indirectly through others).

While purely structural aspects, such as the level of clustering in a network or the centrality of nodes in a network, are important when studying social network data, it is often necessary to go beyond a purely structural approach in social network analysis and to also include *content*. In network analysis, content can take on a number of different forms. Here, we discuss three important ways that content can help answer research questions, as illustrated by the studies in this issue: the characteristics of the nodes, the context, and the types of ties being studied.

First of all, it is often important to incorporate the *characteristics of nodes* (usually referred to as nodal *attributes* in social network analysis). For example, returning to the network in Figure 1, we might find that when we collect data on people's political views, those in the left group are politically more left-leaning and those on the right are more right-leaning, which would provide a different perspective on the story. Given this extra information, we might infer that the network structure has come about as a result of a tendency for people to connect to people who are similar to themselves on specific characteristics, such as political views (often referred to as *homophily*; McPherson, Smith-Lovin, & Cook, 2001).

Similarly, from a social capital perspective, when using an ego-network approach to explain individual well-being, it might be helpful to not only consider *how many* friends a person has, but also *what characteristics* these friends have (i.e., to also incorporate information about ego's contacts). In this respect, the contribution by Repke et al. (2021) in this issue takes a closer look at the ethnocultural background of the network contacts of migrants and refugees. When moving to a new country, migrants usually start with few connections in the destination country. However, these networks tend to change over time. The authors argue in their paper that the development of well-integrated networks that include both individuals from the new host country and people from the migrant's own ethnocultural background is essential for psychological and

socio-cultural adjustment in the host society. Hence, as Repke and colleagues argue further, research on integration needs to go beyond looking at migrants and refugees as independent, distinct entities. Instead, it should also incorporate how they are embedded in the broader society by considering how they interact with different types of members of the host society and the country of origin. They illustrate the benefits of combining an individual-level and relation-level perspective using two specific cases: (1) the type of networks that Eritrean and Syrian refugees build as they move to Germany; and (2) the network structure and composition of Ecuadorian, Moroccan, Pakistani, and Romanian immigrants who settled in Barcelona, Spain. The two cases go beyond focusing purely on the network structure. The first case study mainly examines the cultural composition of the networks of these refugees. In contrast, the second case study combines compositional information with relational information of immigrant networks to shed light on intercultural contact from an intergroup perspective.

Second, the *context* can provide another important aspect of content. For instance, when we examine the network ties inside a school class, an organization, or within another bounded group, we might need to consider its culture, setting, as well as a temporal dimension. We might wonder to what extent specific social processes found in one context transfer to other contexts. The content is then the specific setting. The contribution by Gauthier and Bogdan (2021) in this issue is exemplary in its exploration of a similar question: How can collective decisions be made towards sustainability? They present their findings for two very different contexts: (1) involving a local-level natural resource management network among three local Canadian communities; and (2) involving the lobbying network at the European Union level. Both cases are about the decision-making processes of elites. Whereas the first case is an example of a decentralized governance approach in Canada, the second one showcases a more centralized approach

to governance within the EU. In the first case, the authors show how collaboration partners interacted to achieve sustainable management solutions by analyzing which actor types engaged in specific activities within the decision-making process. Further, they identify actors in equivalent positions within the network, which facilitates the search for potential collaboration partners who can fill the void if an actor leaves the network. In the second case, they take a closer look at the composition of the lobbying network and identify two different lobbying strategies based on the connectivity of actors.

Another example of context is provided in the paper by Kriegl et al. (2021), which includes a temporal dimension. In particular, the authors focus on the social capital or social support needed to deal with a natural disaster. They look at the networks of fishers and farmers before and after an abrupt environmental change occurred to answer the question as to how nature and humans can recover from natural catastrophes as quickly as possible to survive. The paper by Kriegl and colleagues provide two such examples of how social communities cope with environmental crises: (1) the El Niño event of 2017 that hit scallop farmers particularly hard in the region around Sechura Bay in Peru; and (2) the Cyclone Aila that severely impacted crop farmers in the delta of Bangladesh in 2009. The authors show that the larger and more diverse and better connected the social support networks of the affected individuals were before the crises, the better they could cope with these environmental disturbances. This shows the importance of being able to activate sometimes dormant networks at crucial moments and that those specific contextual situations might require different network relations.

Third, a purely structural approach might ignore the specific *type of tie* that is being investigated. A liking tie, for instance, might not exhibit the same patterns as a communication tie, and specific types of tie can lead to very different structures. The first case presented by Repke and colleagues (2021) highlights the

different functions that ties can fulfill for refugees: some ties might be communication ties that are helpful for discussing personal matters, while other contacts might be more useful for spending leisure time and still other ties might be crucial for providing instrumental support. Another example can be found in the paper by Gauthier and Bogdan (2021). In their study, ties could also refer to different activities actors do together, such as negotiating, discussing, or working together. While their first case highlights cooperative decision-making processes between researchers, community partners, management, and other organizations, the second case focuses more on influence and lobbying within the decision-making process of the European Commission.

Another fascinating and unique perspective on networks comes from using digital information. In an increasingly digitized world, we leave more and more digital behavioral traces. These traces are either left by using digital technology or are harnessed by digital technology and are referred to as digital behavioral data (DBD). These data open up a new avenue for applications in social network research. Lietz et al. (2021) discuss two in particular: (1) mining individual attributes and attitudes; and (2) mining macro behavioral patterns to uncover the micro-macro dynamics of behavior. The authors emphasize the relational nature of DBD and point out that attributes and attitudes can be either inferred from found DBD or, in the case of attributes, also be harnessed directly by applying digital technology, enabling to answer not only how much a node is connected, but what attributes other nodes have.

In closing, this issue is in large part a reflection of the conference “Content Meets Structure: Integrating Different Perspectives on Social Networks” organized at and financed by the Heidelberger Akademie der Wissenschaften on 28-30 September 2020. The lively discussions at the conference have resulted in new collaborations among researchers from different fields and, eventually, in the four papers brought together in this issue. Each of these contributions provides a unique perspec-

tive on how network analysis can be useful in answering their respective research questions. These studies span a variety of disciplines and illustrate how integrating content and structure can provide a richer understanding of the specific topic when using social network analysis. We especially thank the Heidelberger Akademie der Wissenschaften for making this possible and supporting us in the bilingual production of this issue.

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