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The relative effects of diversity on collective learning in local collaborative networks in Belgium

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Abstract

Collaborative networks are horizontal settings of public governance that enhance interactions between a diversity of actors (for example, civil servants, companies or citizens). They can help crosscutting public policies (for example, climate policies) to gain coherence and become more innovative. To do so, collective learning, defined as the broadened and mutual understanding of public issues arising out of repeated social interactions, is critical but not spontaneous. In particular, the diversity of participants creates learning opportunities that do not necessarily transform into concrete learning.

So, how does diversity lead to collective learning in collaborative networks? To address this research question, this article researched two collaborative networks within the city administration of Schaerbeek (Belgium). Based on semistructured interviews, mental models were used to assess collective learning, and social network analysis was performed to understand the structure of interactions between diverse members.

The findings show that the influence of diversity on collective learning was contingent on the collaborative network, but fostered by social interactions, with noticeable links between formal and informal interactions. From these findings, the article makes three scholarly contributions. First, it deepens our understanding of collective learning, with a focus on the development of shared understandings as a condition of consensus formation. Second, it builds on psychology and resource management research to assess collective learning through mental models, and provides a new approach to the measurement of policy learning. Third, it contributes to the debate on the implications of different inclusion levels and conditions for the results of collaborative governance and their transformation in policy innovations.

Key words

collaborative governance • collective learning • diversity • mental model • social network analysis • policy learning • Belgium

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1. Introduction

Many public issues, such as climate change, or public health, do not offer solutions that are single, immediate, definite, or true for every stakeholder. How people from various public services with or without civil society members can address them in a collaborative way has been abundantly researched (e.g., Ferlie *et al.*, 2011; Fisher *et al.*, 2020). This is important, because contemporary public services are pushed to facilitate participation in policy making and implementation. This is challenging, because they have been fragmented by logics of new public management and – in some countries such as Belgium – federalization and decentralization. 'Collaborative networks' (Agranoff, 2006) involve participants with a diversity of expertise, resources, and interests, who are expected to assemble and articulate their beliefs and preferences to produce reasonable solutions. This is called the 'collaborative advantage' (Huxham and Vangen, 2005).

The advantage of collaborative networks is strongly related to learning dynamics. In collaborative networks, participants interact with each other. They share and acquire new information, which, over time, leads to alterations of their individual beliefs and preferences. Collective learning occurs when individual learning curves adjust to each other as a result of interaction. Much like individual learning in policy processes (Sabatier and Weible, 2007) or organizational learning (Argyris and Schön, 1978), collective learning in collaborative networks can be more or less profound. The adjustments can be moderate when network members become more aware of each other's interests, beliefs, and preferences. The adjustments can be stronger when members' preferences converge and transform into consensual decisions. However, moderate adjustments condition stronger ones.

Collective learning is also a crucial output of collaborative governance to address cross-cutting problems characterized by a multitude of actors and points of view. In such situations, mutual understandings are crucial to avoid conflicts and blockades (Klijn and Koppenjan, 2016).

However, collective learning does not always occur in collaborative networks. For example, learning is facilitated by institutional norms (Benz and Fürst, 2002; Pahl-Wostl et al, 2007) or network leaders who are able to effectively disseminate information across the network with all

participants (Pietri et al, 2015) as well as to create adhesion and engagement through frequent interactions (Gerlak and Heikkila, 2011). In this article, we focus on the role of diversity as a lever for collective learning in collaborative settings. Diversity is a key issue in collaborative governance (Ansell *et al.*, 2020), because collaborative governance precisely captures 'cross-boundary collaboration' (Crona and Parker, 2012). In this context, the interactions necessarily occur between actors with a diversity of backgrounds, characteristics, expertise, beliefs and preferences. However, the empirical findings on the role of diversity in collective learning are conflicting. Some works found diversity to be helpful for collective learning (Crona and Parker, 2012; Leach et al, 2014), whereas others suggest that diversity can impede it (Siciliano et al, 2021). Whether and how diversity generates learning remains unclear.

While expertise, beliefs and preferences can be diverse in a network, they do not necessarily circulate nor lead to mutual adjustments. Social interactions are the opportunity for participants to share their views (Wyborn, 2015; Temby et al, 2017). In addition to the intensity of interactions, one may wonder about the structure of interactions, that is, who interacts with whom. In particular, the notion of homophily – the extent to which individuals interact with those similar to them – is investigated to understand the effects of diversity on learning (Golub and Jackson, 2012). Therefore, to refine our analysis, we introduce social interactions as an intermediary variable between diversity and collective learning.

This article explores how different types of diversity, mediated by social interactions, influence the extent to which network members become more aware of each other's interests, beliefs and preferences. To do so, we looked at two collaborative networks in Schaerbeek, a city of approximately 120,000 inhabitants situated in the Brussels–Capital Region in Belgium. The members of these networks worked on plans to promote diversity and implement sustainable public procurements by the municipal administration. We collected data among the participants in these two networks using questionnaires and semistructured interviews. Mental models were used to assess collective learning, and social network analysis was performed to understand the structure of interactions between diverse members.

The added value of this article is threefold. First, it deepens our understanding of collective learning with a focus on the development of shared understandings as a condition of consensus formation. Second, it builds on psychology and resource management research (e.g., Rouse and Morris, 1986; Steger *et al*., 2021) to assess collective learning with mental models and then provides a new approach to the measurement of learning in policy processes (Squevin et al,

2021; Zaki et al, 2022). Third, it contributes to the discussion about the implications of different inclusion levels and conditions for the results of collaborative governance (Ansell et al, 2020). The article reads as follows: after an overview of the theoretical insights, the context, and the methods of data collection and analysis, the results are presented and discussed.

2. Concepts and theory

2.1. Collective learning in collaborative networks

Collaborative governance refers to the "type of public governance system in which cross-boundary collaboration represents the predominant mode for conduct, decision making, and activity between autonomous participants who have come together to achieve some collective purpose defined by one or more target goals" (Baird et al, 2019). In this context, collaborative networks (Agranoff, 2006; Mischen, 2015; Bodin et al, 2017) are stable working groups composed of members from different organizations (or departments) and backgrounds, working together on elaborating or implementing solutions to public issues. Compared to other modes of public governance, such as hierarchical and market governance (Bouckaert, Peters and Verhoest, 2010), collaborative governance is presented as "advantageous" (Vangen and Huxham, 2010). Collaborative networks are said to facilitate exchanges of knowledge, expertise and resources (Sørensen and Torfing, 2011; O'Leary and Vij, 2012), as well as trusted relationships between individuals and, consequently, to reduce conflict (Ran and Qi, 2019).

However, collaborative governance is not a panacea: it can lead to unsatisfactory results when issues such as conflicts of interest, power asymmetries, cultural differences, lack of political will or lack of communication are not addressed properly (Ansell and Gash, 2008; Sørensen and Torfing, 2011; Doberstein, 2016). Despite ambitions of horizontality, collaborative governance remains a social space with possible power dynamics playing out (Purdy, 2012). If it works, it is a very costly solution. Many times, collaborative governance fails to create the expected advantages and becomes stuck in inertia (Huxham and Vangen, 2005).

Learning lays at the heart of collaborative governance, as the coordination between actors is expected to occur along a process of mutual adjustment. By voluntarily exchanging information and expertise, network members update their views and beliefs on the issue at hand and learn from each other. Individually, the concept of learning refers to the enduring acquisition or modification of an individual's cognitive constructs (VandenBos, 2015; Nowlin, 2021) or beliefs. In the context of collaborative networks, in line with Dunlop and Radelli (2013) as well

as Gerlak et al. (2018; see also Heikkila and Gerlak, 2013), learning is concerned with and can result in changes in policies, public services or governance outcomes. To do so, it must be social, which involves (1) cognitive changes at the individual level (2) that extend to the group (3) through social interactions (rather than only through readings, for example) (Reed *et al.*, 2010).

Collective learning occurs in a collaborative network when actors' beliefs about the dimensions of the public issue and about the possible solutions to it (e.g., van der Wal *et al.*, 2014) align or converge over time. It does not necessarily imply that these actors agree on a preferred solution. In this view, we adopt a relatively loose understanding of collective learning as the development of shared understandings or a mutual "agreement on a common framework, through which the diverging values, perceptions and goals of the participants can be integrated" (Herrero et al, 2019, p.753). The growing awareness of other members' beliefs (Muro and Jeffrey, 2012; van der Wal et al, 2014; Gerlak et al, 2018) is part of this movement of shared understanding, and as such, is considered a minimal form of collective learning.

Collective learning on its own is not sufficient for policy to change, but, defined as the development of shared understandings, collective learning facilitates consensus formation about policy or governance changes (Ansell and Gash, 2008; Klijn and Koppenjan, 2016) and is a steppingstone for decision-making (Heikkila and Gerlak, 2013; Leach et al, 2014; Koebele, 2019). Also, collective learning is not desirable *per se* under all circumstances. Indeed, the development of shared understanding can sometimes emerge in a way that favours the views of dominant participants at the expense of peripherical positions of marginalized participants. This is a reminder that power dynamics are not absent in collaborative networks (Agranoff, 2006; Ran and Qi, 2019).

Theoretically, collaborative governance builds on the foundation of diversity. Collaborative governance is about 'cross-boundary collaboration' – specifically about mixing categories of actors (Crona and Parker, 2012): "participants start with diverse views of the world and the problems they face. As they try to understand the problem and each other's interests, they develop a more nuanced and complex understanding of the problems from various perspectives" (Booher and Innes, 2002, p.227), producing collective learning. Yet, nature and role of diversity in collective learning remain unclear (Riche et al, 2021): some works found diversity to be helpful for collective learning (Crona and Parker, 2012; Leach et al, 2014),

whereas others suggest that diversity can impede it (Siciliano et al, 2021). In the next section, we define diversity and review the diverging results on diversity–learning relations.

2.2. Diversity and collective learning in collaborative networks

Diversity, at its most general level, is a way to think the relations between categories (Baird et al, 2019). Objective (or visible) diversity (in terms of profiles) and subjective (or invisible) diversity (in terms of beliefs and opinions) may be distinguished (Milliken and Martins, 1996; Siddiki et al, 2017). Objective diversity is essential to capture the composition of the collaborative network whereas subjective diversity is necessary to look at learning. Diversity is a situation; it is the composition of a group at a certain point in time. In collaborative networks, it is also the result of a specific selection process. For instance, the coordinators might choose to convene participants based on their own social network; or they might organize a relatively complex selection process based on voluntary application or election. The selection process depends on the available resources, the institutional constraints, the purpose of the collaboration (Sabatier et al, 2005; Margerum, 2011; Scott and Thomas, 2017) and more generally, on the assessment of the coordinator. There are two competing views on diversity–learning relations in collaborative networks. The "value in diversity" approach (Cox et al, 1991) finds clues that diversity increases perspectives and knowledge exchange: "when members with diverse opinions and backgrounds share and constructively debate their unique viewpoints, groups will be able to achieve more creative and innovative solutions than would have been possible with a homogeneous group" (Jehn et al, 2008, p.130). Accordingly, diversity would be conducive to collective learning in various contexts, such as participatory research (O'Brien, Marzano and White, 2013), environmental governance of biospheres (Baird et al, 2019) and top management teams (Boeker, 1997). In a similar vein, a variety of perspectives increases the chance for individuals to learn new information and for collective learning products to represent all interests (Benz and Fürst, 2002; Cundill and Fabricius, 2010; Yamaki, 2016). According to the "value in diversity" approach, we expect that diversity is associated with more collective learning.

According to the second view on diversity–learning relations, diversity exerts a negative influence on trust and can create relational issues. Trust is well established as a crucial factor conducive to learning (Leach et al, 2014; Juerges et al, 2017; Siddiki et al, 2017; Newig et al, 2019; Riche et al, 2021) because "trust helps participants to open up and share insights and

information" (Ernst, 2019). However, diversity affects trust. The interaction between diversity and trust stems from fundamental interpersonal dynamics of homophily: individuals tend to engage more with those who resemble them (McPherson et al, 2001). Similarly, they tend to be reluctant to interact with individuals who appear different. Therefore, in a situation with diverse collaborators, individuals can develop a feeling of identification with an in-group (composed of similar others) and a feeling of suspicion towards an out-group (dissimilar others). In-group homophily can result in defensive attitudes towards the other groups and burst into conflict (Jehn, Greer and Rupert, 2008). Even if the situation does not escalate to conflict, the 'in-group and out-group bias' (Tajfel, 1981) impedes learning, as individuals tend to accept information from the in-group more readily. Conversely, one tends to negatively evaluate and distrust information provided by the out-group. For those reasons, diversity can make social interactions, and thus collective learning, more complicated.

That said, learning in collaborative settings can only be the result of an extremely complex web of entangled factors and conditions (Armitage, 2005; Ansell and Gash, 2008; Gerlak and Heikkila, 2011; Emerson et al, 2012). In particular, diversity of actors implies differences between them in terms of interests and resources, which in turn can translate into power asymmetries (Crona and Parker, 2012; Kulundu, 2012; Purdy, 2012; Herrero et al, 2019). If not managed properly, power dynamics can persist and allow some actors to capture the process at the expense of more marginalized ones. In such scenario, peripherical beliefs from marginalized participants have fewer chances to be learned, compared to the beliefs of dominant participants. Following Puwar (2004), "space invaders" can be suspected to learn how to adapt to dominant beliefs rather than to diffuse their own positions. In other words, who learns what from whom in contexts of diversity is important to account for (Agranoff, 2006; Purdy, 2012; Ran and Qi, 2019). To the opposite, deliberative contexts are found to favour learning. Such constructive contexts are characterized by face-to-face interactions, consensus-oriented discussions, and the deliberation of diverse information (Leach et al, 2014; Koebele, 2019; Newig et al, 2019). The extent to which the collaborative process becomes a space of domination or of deliberation, which respectively hampers or fosters learning, depends a lot on the capacities of the coordinator to acknowledge and reduce power imbalances. Finally, the transformation of diversity into collective learning depends on social interactions. A first element to consider is the frequency and intensity of social interactions. Intuitively, frequent contact with dissimilar participants increases the opportunity for individuals to exchange information, to justify their positions and to be confronted with alternative points of view (Gerlak and Heikkila, 2011;

Crona and Parker, 2012; Newig et al, 2019). Consequently, a limited level of learning is expected if opportunities to interact are restricted (Gerlak and Heikkila, 2011; Muro and Jeffrey, 2012; Newig et al, 2019). Frequency of interactions depends on the number of meetings that are organized in the framework of the collaboration (e.g., Riche, Aubin and Moyson, 2021). Beyond formal meetings, participants in a collaborative network are likely to interact informally - e.g., during random encounters at the office, chats in the hallway or on phone calls. During such informal interactions, they might also exchange views on the issue treated by the collaborative networks. Informal interactions are also conducive to learning (Keikotlhaile et al, 2015; Temby et al, 2017). Interestingly, informal interactions might be able to better capture the dynamics of homophily (Kleinbaum et al, 2013) and the quality of social interactions in the network. Indeed, as everyone is invited to participate to formal meetings, we can only capture the extent to which some pairs of actors interact more than others when looking at informal contacts.

3. Research design

This study is based on the analysis of two collaborative networks in Schaerbeek, a city of 130,690 inhabitants located in the north–east of the Brussels-Capital Region in Belgium. The city administration is composed of approximately 1,500 civil servants. (IBSA, 2022; Schaerbeek, 2022)

The first collaborative network examined in this study was organized to elaborate a plan promoting diversity and fighting discrimination within the administration ("Anti-discrimination network"). It is a legal obligation[1] for the municipalities in the region to adopt, in consultation with the employees, a plan to promote the representation of all components of the population in the local administration and to fight against discrimination based on gender, age, origins, or disabilities. In Schaerbeek, the process was launched in 2017 with the recruitment of a diversity manager in charge of steering the plan in a collaborative way. A committee composed of 13 members from 8 different departments was created to support the project. They had nine meetings to discuss measures and to follow their implementation. The final plan comprises 19 measures (14 were effectively implemented) related to the process of recruitment in the municipality (e.g., encouraging the validation of experiences not validated by a diploma), internal and external communication (e.g., awareness-raising campaign,) and daily life at work (e.g., reasonable accommodations for the disabled).

The second collaborative network worked on the sustainability of public procurements ("SPP network") of the municipality. In 2017, Schaerbeek joined a European network of 6 cities exchanging good practices on public procurements. A coordinator from the Subventions and Partnerships department quickly gathered a team of twelve members from six departments. During the first part of the project, a spending analysis was performed. Based on this analysis, the team elaborated a Strategic Plan for Sustainable Public Procurements that was adopted by the municipal executive in March 2021. Three trips for some of the participants were organized in the cities participating in the Making Spend Matter network.

Both networks are composed of a similar number of agents from a similar number of departments working within the city administration of Schaerbeek on a voluntary basis on projects steered by upper-level authorities. Furthermore, all collaborative projects, in Schaerbeek, are managed following a relatively common methodology that standardizes, to some extent, the leadership and norms that govern them. In other words, there are many theoretical reasons (Riche et al, 2021) to believe that contextual variables could influence learning in similar ways in the two cases. At the same time, the results will show that the variables of interest – that are levels of collective learning, diversity and social interactions between the participants – differ in various respects in the two cases. This configuration is typical of most similar system designs (Anckar, 2008).

Qualitative and quantitative data were collected in December 2021 and January 2022, when both the antidiscrimination and SPP networks were dissolved. Contacts were made with the coordinators of the networks who then transmitted our request to the other members. This strategy proved successful, as all members answered positively: in total, 25 semidirected interviews were conducted, recorded, and transcribed by the first author – 18 in person and 7 online (4 in the SPP network ; 3 in the Anti-discrimination network). They lasted approximately 50 minutes (30 to 93 minutes). The encounter started by completing a questionnaire of 15 items covering basic demographics (4 items), social interactions (2 items) and perceptions of the network (9 items). Then, questions were asked to elicit the individual mental model of the participant as well as their perceptions of the collaborative network and process. This intensive collection of quantitative and qualitative data generated a comprehensive view of the network and its participants. Moreover, the minutes of the meetings, as well as the content of the antidiscrimination and SPP plans and their evaluations, were used to document the functioning of the network more objectively (e.g., timeline, presence rate).

4. Measures

4.1. Dependent variable: collective learning

Collective learning is conceptually operationalized with the notion of the "mental model", which is one's internal representations of his or her environment (Johnson-Laird, 1983). Mental models are (necessarily incomplete) internal structures that mirror the external environment of the ego (Halford, 2014). In the literature, mental models are a well-established way of assessing individual learning in the field of education (Mumford et al, 2012; Batlolona and Souisa, 2020; Vogt et al, 2021). Management research has relied on mental models to assess team learning (Chang et al, 2021; Steger et al, 2021). Mental models are webs of concepts. When individuals are confronted with new information – e.g., through social interaction – mental models can evolve through the (dis)appearance or adaptation of (some) beliefs or the links among them – which is a learning process (Rouse and Morris, 1986; Vandenbosch and Higgins, 1996; Halford, 2014).

We relied on Özesmi and Özesmi's (2004) approach to elicit individual mental models during the interviews. Depending on the network in which they participated, members were asked starting questions: "How can diversity be improved in Schaerbeek?" and "What are the drawbacks to making public procurements more sustainable in Schaerbeek?" The respondents openly shared their thoughts on the topic while the researcher reported these thoughts in the form of a mental model under the supervision of the respondent. The researcher encouraged the respondent by asking for clarifications. The mental model was complete once the respondent deemed that it was and had no more elements to add. An example is presented in Appendix A.

Then, collective learning was measured using two approaches corresponding to its two dimensions: the newness of information and the emergence of a shared vision. On the one hand, the respondent was asked to point to the beliefs that appeared or were adapted throughout the process. Beliefs are subjective associations between an object and an attribute (Fishbein and Ajzen, 2010), for example, "the market [object] is not mature enough for sustainable public procurements [attribute]". Per network, the average percentage of beliefs declared as learned by the participants (out of all beliefs cited) gives an indication of the extent to which members assimilated new ideas. On the other hand, since collective learning implies that individuals align their beliefs, the commonalities between participants' mental models are measured. Specifically, a table is built for each network with, in columns, all interviewees of the network and, in lines, all the beliefs they shared in their mental models. Citations, i.e., the number of

times a belief is cited by the participants, as well as the citation score, i.e., the number of citations normalized by network, are calculated. Collective learning is thus operationalized through two scores ranging from 0 to 100%. To conclude that collective learning indeed occurred in a network, both metrics need to be meaningful. In both cases, null numbers are the indication that no learning occurred in the network, while 100% is the indication that the whole mental model results from a learning dynamic.

4.2. Diversity

Objective (or visible) diversity (in terms of profiles) and subjective (or invisible) diversity (in terms of beliefs and opinions) are distinguished (Milliken and Martins, 1996; Siddiki et al, 2017). The objective diversity of the network members is operationalized with several quantitative and qualitative indicators: in addition to basic demographics such as gender, age, and educational background (Siddiki et al, 2017; Siciliano et al, 2021), we look at the hierarchical level and departments of the participants as important professional factors to account for in an administration. A Blau heterogeneity index (Siddiki et al, 2017) is calculated for each of these characteristics; the larger the Blau heterogeneity score, the greater the diversity – with the exception of the departments because they differ from one network to another.

The subjective diversity of the network members is operationalized with a questionnaire item and with interview analysis. The respondents reported on a Likert scale from 0 to 10 whether they were confronted with new ideas during the collaborative process. In interviews, they were also asked whether they were satisfied with the composition of the network and the extent to which all perspectives were represented in the discussions and meetings.

The level of diversity in the collaborative networks is not random, but rather the result of a selection process. This phase is important to account for the processual dimension of diversity. It also allows to understand the motivations of the coordinator to broaden or to limit inclusion, and the openness or reluctance of the participants towards diversity. The selection process was documented and discussed during the interviews.

4.3. Social interactions

Objective and subjective formal interactions are distinguished. The former refers to the number of meetings between all or (a significant) part of the members. Subjective formal interactions

relate to the discussions during the meetings and are assessed with a Likert-scale item ranging from 0 to 10 reporting whether the participants had the opportunity to listen to everyone's ideas during the meetings. During the interviews, the participants were also asked about dynamics of the group, in order to identify potential conflicts, tensions or distrust, or whether deliberation was the norm.

To measure informal interactions, a social network analysis (Knoke and Yang, 2008) was performed. The nodes are the network participants, while the edges are the informal relationships operationalized by asking all respondents with whom they had informal discussions, e.g., hallway talks, email exchanges, coffee room discussion, etc., about the project outside of organized meetings. These links are directed because A may have declared talking with B without B declaring discussing with A. We looked for clusters and checked for potential central individuals. At the cluster level, cliques are subsets of nodes that are all bidirectionally connected to each other. To account for the relations between social interactions and diversity, assortative scores or the extent to which clique members are alike, compared to the rest of the network, were calculated. Assortative scores are between -1 (maximal heterophily) and 1 (maximal homophily). At the node level, we looked at degrees (the number of connections a participant has), closeness centrality (how likely a participant is to be the most direct route between two other participants), eigenvector centrality (how fast a person can reach everyone in the network), and betweenness centrality (how well this participant is connected to other well-connected participants). Together, these individual measures point to the key participants of each network. Informal interactions were also discussed during interviews.

5. Results

5.1. Collective learning

Based on the individual mental models of the network participants, we look at collective learning (Table 1). In the SPP network, 26 distinct beliefs were mentioned by the 12 respondents, with a mean of 14.42 beliefs per respondent. On average, one belief is shared by 54% of the respondents. In other words, without prior concertation, more than half of the beliefs spontaneously mentioned by the participants are common to the group. More specifically, three concepts were cited by everyone: the legal constraints of public procurements (free market and choice of the lowest price) are not in favour of local small and medium enterprises; there is a lack of political will to transform good intentions into prioritized actions; and there is a lack of

managers taking the lead in the administration. The mental models of the participants are quite similar, suggesting that, at the end of the process, they were holding similar views on the issues related to sustainable procurement in the municipality and how to possibly solve them. On average, the respondents reported that they had learned 24% of the beliefs they cited throughout the collaborative process (even though experts may be reluctant to admit they learn: Leach *et al.*, 2014).

In the antidiscrimination network, in total, 38 distinct beliefs were mentioned by the 13 respondents, with a mean of 14.31 beliefs per respondent. On average, one belief is shared by 29% of the respondents. No belief was unanimously shared by the respondents. In contrast, some beliefs were quite subversive and critical towards the institution and/or against the main goal of the collaborative network. For instance, some participants reported a cultural laxity towards discrimination or even open racism, as well as clientelism ('string-pulling') in recruitment. Some were sceptical about the main idea of favouring diversity, arguing that meritocracy suffices or that the public servants are already representative of the population in Schaerbeek. On average, 14% of the beliefs elicited by each participant were learned.

Overall, collective learning is higher in the SPP network: the members acquired more new beliefs, and their mental models resemble each other more. They developed a more common vision on the issues of sustainable public procurements and on the solutions that could be implemented than in the antidiscrimination network.

	SPP network (12 members)	Antidiscrimination network (13 members)
Total number of beliefs in the network	26	38
Citations per belief	Mean: 6.46 St. deviation: 3.80 Min: 1 Max: 12	Mean: 3.78 St. deviation: 2.43 Min: 1 Max: 9
Citation score per network (citation/number of members)	Mean: 0.54 St. deviation: 0.32 Min: 0.08 Max: 1	Mean: 0.29 St. deviation: 0.18 Min: 0.08 Max: 0.69
Beliefs declared as learned per member	Mean: 3.33 St. deviation: 3.39 Min: 0 Max: 13	Mean: 2 St. deviation: 1.29 Min: 0 Max: 4
Network average of beliefs declared as learnt (Beliefs declared as learnt/Beliefs recalled/Number of members)	Mean: 0.28 St. deviation: 0.26 Min: 0 Max: 1	Mean: 0.14 St. deviation: 0.10 Min: 0 Max: 0.33

Table 1. Individual mental models in the two networks

5.2. Diversity

The selection process for the SPP network was based on the assessment of the situation by the coordinator. As the call for application for this European project was on short notice, she quickly gathered a team by contacting people she considered relevant on the issue, who were colleagues in charge of public procurements, data management and sustainable development in the municipality. Later on, the team was completed based on the suggestions of the existing members. There was no formal procedure and the main rationale for recruitment was competence.

To the contrary, the selection process in the Anti-Discrimination team was a formal one. The coordinator sent an invite to join a working group on diversity to all the email addresses of the municipality. About 40 people answered positively (on the 1,500 employees of the municipality), with the exception of D or E levels employees (lower hierarchical levels). Contrary to office workers, most of them do not have an email address. The coordinator was aware of this lack of diversity and tried to correct it by calling the field manager who answered positively to join the team himself and proposed names of workers. During a workshop, the 40

people were asked to identify discrimination issues in the municipality and to propose improvement actions. In May 2018, to create a smaller accompanying team, an election without candidate was organized. This specific methodology starts with a collective discussion about the positions to be filled and the expected profiles. Then, each person voted for 6 colleagues and justified they should be part of the working group. After hearing everyone's arguments, people were given the opportunity to update their votes. Someone then made a proposition of 8 people for the working group composition, proposition debated in several roundtables until no further objection. The coordinator was satisfied with the selection process she considered "transparent". That said, a few participants rather judged this process as unnecessarily complex and unclear, or even as "manipulative", "bogus", "very weird and hypocritical".

Diversity of network membership can be objective and subjective. Regarding objective diversity, the Blau indices suggest that the antidiscrimination network is slightly more diverse than the SPP network in terms of age and educational background (Table 3, Annex B), but the differences are very small. The indices overall are higher in terms of gender, hierarchical levels and departments. The SPP network is more diverse in terms of gender but less diverse in terms of hierarchical levels, as it includes only the highest-level officials and departments (six out of eight). Overall, objective diversity seems higher in the antidiscrimination network than in the SPP network.

As far as subjective diversity is concerned, participants' appreciation of the extent to which they were confronted with new ideas and perspectives in the network is relatively high in both networks, with an average of 8.25 for the SPP network and 7.85 for the antidiscrimination network. The responses ranged from 5 to 10 on a 1-10 scale: interestingly, in the SPP network, the lowest score was given by the most experienced participant, who supposedly knew the most about the topic and was thus less likely to hear new information. Even though the mean of this metric is slightly lower in the antidiscrimination network, it is close to eight in both cases, suggesting that most members were confronted with many new ideas and perspectives.

Subjective diversity was also assessed during the interviews. The participants in the SPP network unanimously reported that the required expertise and knowledge were represented.

> *"For this project, we could rely on high-quality professionals who were able to contribute with their experience and expertise […]. And even if they were not experts in the subject, they had their own competence and therefore were able to contribute a lot."* – SPP Network, Participant 5.

The appreciation was far less positive in the antidiscrimination network. The main concerns related to the lack of field workers (levels D and E) compared to office staff (levels A, B and C) as well as the overrepresentation of white and highly educated individuals. Some felt that only converted were preached, as members were already aware of diversity and discrimination issues.

> "*Our group should be more representative of the different grades, there should be workers. The composition was not diverse enough. It was all college level, mostly white.*" – Antidiscrimination network, Participant 2.
>
> "*Often people were already at the same level and shared the same vision. There were differences of opinion, sometimes a little bit. But it was often the same profile anyway*." – Antidiscrimination network, Participant 4.

Overall, these quotations allow us to fine-tune the appreciation of diversity, which was higher in the SPP network than in the antidiscrimination network, according to the participants.

5.3. Social interactions

While there were far more meetings, i.e., objective formal interactions, in the SPP network (30 meetings) than in the antidiscrimination network (eight meetings), participants' perceptions of the extent to which they had the opportunity to listen to everyone's ideas during those meetings, i.e., subjective formal interactions, were high in both networks: on a 1-10 Likert scale, the means were equal to 8.67 (SPP network) and 7.69 (anti-discrimination). While one respondent reported a '2' in the antidiscrimination network, the standard deviations are still relatively weak (2.39) in this network.

The qualitative data gives more insights about the deliberative dynamics of formal interactions. SPP network participants highlighted openness to other ideas and respectful listening abilities of everyone. They reported no conflict.

> *"I think it worked very organically. There was a lot of listening, respect and goodwill within the group. I'd like to stress that because it's not always like that." – SPP Network, Participant 6.*

In the Antidiscrimination network, the participants did not mention open conflicts neither, but the description was less laudatory. Several participants described the interactions as "constructive", "oriented towards mutual understanding" and "respectful", but also mentioned that participants were generally reluctant to change their mind.

> "*Conflicting, certainly not. Respect, listen, that's no problem. But I often get the impression in this kind of discussion that everyone is sticking to their initial idea. Obviously we're talking about a group that has a certain openness and so on, but they have their own interpretation of things. There are exchanges, but I'm not sure whether there are any real changes in thinking. Still, the exchange is interesting, because you get to see other people's points of view. But at the end of the day, if you take each person separately, there isn't someone who has suddenly had a revelation and said 'I used to see things like that, now I see them completely differently'. It's more subtle, it's slower*." – Antidiscrimination Network, Participant 8.

Two participants were quite critical and considered that the games were already played and the discussion useless. They reported that there was a 'group effect' in which their minority opinion was not really integrated. Interestingly, the presence of one person high in the hierarchy sparked some discomfort about the freedom of speech and the quality of interactions.

> "*When X gave a point of view, it was difficult to counter it. It is a position of strength, and so I think it was trickier to debate with X. With all due respect, I think it's linked to the position."* – Antidiscrimination Network, Participant 13.

> "*I found it a bit confusing, maybe for the freedom of speech. Also, if someone says at the beginning 'It will not work out', it's certainly not going to work.* […]. *Maybe the hierarchy should not be there all the time?* […]. *Or work in a small team, where ideas are not blocked at the start and there is a safe space for people to talk*." – Antidiscrimination Network, Participant 3.

Regarding informal interactions, we conducted an SNA. In Figure 1, the size of the nodes depends on their number of degrees. The colour of the vertices represents the department to which the participant belongs. Several SNA indicators are detailed in Table C1 in Appendix C.

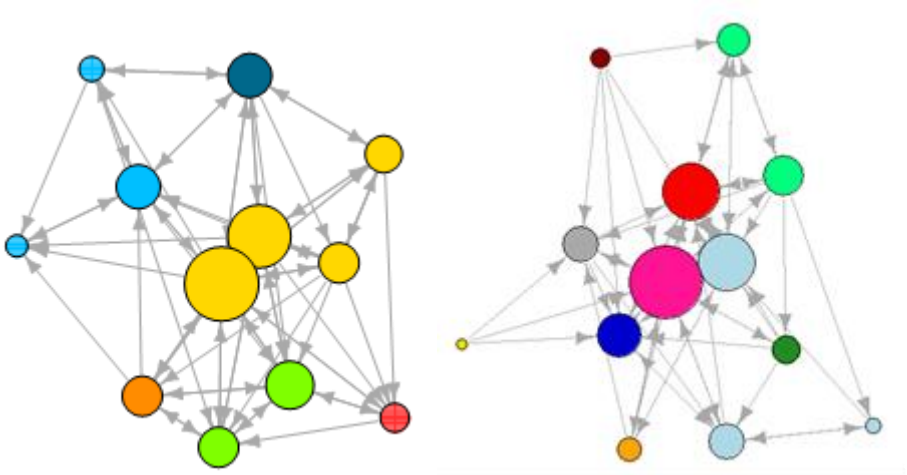

Figure 1. Social network analysis of the two networks: graphical representations

At the cluster level, in the SPP network, we found one clique that corresponds to the department of the coordinators (4 members, yellow nodes in Figure 1). This was confirmed in interviews when the members described the organic functioning of their department and their intense discussions on the project. In the antidiscrimination network, we found five cliques of three members. The members of those small clusters were not colleagues from the same department or working on the same project. The highest assortative scores were for gender. However, this score is still quite low and reflects the unequal composition of the network (3 men and 10 women). The assortative scores on other criteria (Appendix C, Table 5) are close to 0, meaning that ties did not form along similarities. These results at the cluster level indicate that no striking mechanisms of homophily or heterophily was observed in neither network.

At the individual level, unsurprisingly, the network coordinators were the most connected participants in both cases according to all the indicators (degree, eigenvector, closeness and betweenness). The detailed scores can be found in Tables 6 and 7 of Appendix C. Interview quotations reveal how they used informal interactions to facilitate the process.

> *"It was necessary to understand the dynamics between the different people and to grease the wheels. It's within these meetings, but also between them, that we really make all the adjustments that need to be made between people, so that we make one step forward and not two backwards. It's […] more work than we think because it's a discussion here, a phone call there. It's going over a topic with one of the team members to make sure there hasn't been a misunderstanding. You have to smooth it out all over the place, all the time."*
> – SPP network, Participant 10.

In both networks, a few other participants, holding important resources in terms of expertise, were also particularly well-connected. In the antidiscrimination network, another well-connected participant was interestingly the person in charge of the most cited concept of this network: reasonable accommodations for the disabled. That person indeed 'lobbied' for this cause, as stated:

> "*I get the feeling that in the end, the people who speak the best get heard the best, and that their ideas stick around. For me too, I found that there were a lot of [my views] being taken up. But I was close to [the coordinator], so I did a bit of lobbying on these issues*." – Antidiscrimination network, Participant 5.

In the SPP network, participants highlighted the informal interactions that occured during the field trips. They allowed the participants to build trusted relationships, which in turn facilitated professional activities.

> *"[The trips] were a key activity to animate the project. You don't have to do dozens of them either, but 1 or 2 really allows the group to bond and create this more convivial aspect that we can't do otherwise. The informal moments really helped to create cohesion. […] During the international meetings, we work from 9 am to 5 pm. Then you have all the social moments, the visits, the meals together. You get to know the persons beyond their functions. That makes it easier to ask professional questions."* – SPP network, Participant 2.

6. Discussion and conclusion

Collaborative networks are increasingly frequent in public administration, including at the local level. Collective learning is a crucial intermediate mechanism through which mutual understandings emerge among network participants interacting together. In this article, we investigated the interplay between diversity, social interactions and collective learning based on the comparison of two case studies in Schaerbeek (see Table 2).

The results raise three main findings about the relation between diversity and collective learning in collaborative networks. First, diversity creates opportunities for collective learning by increasing the pool of resources. In the antidiscrimination network, increased awareness of poor language mastery by field workers and the innovative idea of organizing dedicated trainings resulted from interactions between a manager working on the field and office workers. Several respondents also complained that a lack of diversity often prevented situations from being grasped or for public issues to be comprehensively highlighted. Similarly, in the SPP network,

several participants declared having learned much about the technical procedures and legal aspects of public procurement thanks to experts on the topic. Thus, the case studies support the "value in diversity" approach which suggests that some degree of diversity is necessary for collective learning to occur (Cox, Lobel and McLeod, 1991; O'Brien, Marzano and White, 2013; Hatmaker, 2015). This confirms the potential of collaborative governance to bring different kinds of expertise together to develop a more comprehensive understanding of the issue at hand and to facilitate decision-making (Ansell and Gash, 2008; Heikkila and Gerlak, 2013; Koebele, 2019).

Collective learning	New beliefs Common beliefs	**SPP network**	> > >	**Anti-discrimination network**
Diversity	Objective diversity		<	
	Subjective diversity		>	
Formal interactions	Objective formal interactions		>	
	Subjective formal interactions		=	
Informal interactions	Network level • Density • Centralization Cluster level • Clusters • Assortative scores Individual level		> = = = Well-connected coordinators and experts	

Table 2. Comparison of collective learning, diversity, and social interactions in the two networks

That said, diversity also comes with learning challenges. On the one hand, diversity in a collaborative network is the result of a selection process that can be more or less inclusive. The Antidiscrimination network was formed in an intentionally transparent and formal procedure, aiming for inclusiveness. This method suited office employees with an email address, who are used to sit in meetings and felt legitimate to join such process; to the expense of field workers who were excluded. On the other hand, diversity implies differences in resources that can affect the quality of the exchanges. Also, the presence of actors with higher positions resulted in self-

censorship, hindering freedom of speech. Ideas and new information were less discussed and learning limited. Thus, our results confirm that diversity is an opportunity for learning, to the extent that there is actually room for expression (Crona and Parker, 2012; Purdy, 2012; Herrero, Dedeurwaerdere and Osinski, 2019). Diversity can also bring power imbalances that affect the quality of deliberation. No social space, even a collaborative network, is perfectly equal and inclusive for everyone.

Second, our results sheds light on the type of diversity needed for learning: subjective diversity contributes to collective learning better than objective diversity. Collective learning was higher in the SPP network, where subjective diversity was higher. To the opposite, Blau indexes suggest that the backgrounds were more diverse in the antidiscrimination network. However, these objective measures of diversity seem to be misleading as interviews revealed another diagnosis: the antidiscrimination network suffered from an overrepresentation of white-collar workers, women and white people, whereas the SPP network gathered all the necessary diverse expertise. Thus, we conclude that, regarding collective learning, diversity is a relative factor. Participants' subjective perceptions of diversity matter more than the objective diversity of their profiles (Siddiki et al, 2017). As far as collective learning is concerned, diversity should be appreciated depending on the topics and objectives of the network. For example, in collaborative networks working on the digitalization of public services, IT specialists probably need to meet with users for collective learning to occur, whereas hierarchical levels will matter less. Diversity is leverage for collective learning to the extent that the participants in the network actually hold different expertise, ideas and beliefs related to the issue.

Third, diversity transforms into collective learning through social interactions. Both formal and informal interactions were more numerous in the SPP network than in the antidiscrimination network (see Table 7, Appendix C), which supports the assumption that frequent interactions, in general, facilitate collective learning (Gerlak and Heikkila, 2011; Crona and Parker, 2012; Newig et al, 2019). The interviews reveal that informal exchanges were useful to build trust and cohesion, which is known to foster learning (Siddiki et al, 2017; Huang et al, 2022). This observation suggests that informal relationships support formal ones (Li et al, 2021; Huang et al, 2022). Informal connections also fostered the diffusion of some participants' ideas. For example, Participant 3 in the antidiscrimination network was well-connected, particularly to the coordinator, and lobbied for ideas that were found to be the most frequent in other participants' mental model. Socially active individuals seem to propagate beliefs in the network and thus generate collective learning.

More specific effects of social interactions on the transformation of diversity into collective learning can be derived from SNA indicators. The assortative scores were all close to 0 in both networks, suggesting that the participants did not interact more with similar persons in terms of age, gender, educational background, hierarchical level or departments. Nevertheless, in the antidiscrimination network, we identified clusters of members belonging to different departments. The interviews confirmed that collaborative networks foster meetings and exchanges with colleagues from other departments. Specifically, the field trips organized during the SPP network improved participants' knowledge of their colleagues. In public administrations, network dynamics coexist with silo structures (Bouckaert et al, 2010; Sørensen and Torfing, 2022). At the same time, collective learning, which is an important output and intermediate mechanism for decision-making in collaborative networks, remains more spontaneous among colleagues from similar departments. How collaborative networks can actually break silos is certainly another interesting line of inquiry for public administration research (see, e.g., Scott and Gong, 2021).

These results provide useful insights to practitioners, especially to network coordinators. Regarding the importance of subjective diversity, coordinators should assess network composition before as well as during the collaborative process, considering the objective diversity of opinions and expertise represented in the network, but also participants' subjective perceptions about this diversity, in an inclusion effort. Coordinators should be extremely careful in the way they craft the selection process, especially when targeting diverse actors with different communication means and skills. Beyond their 'boundary-spanning' role (Van Meerkerk and Edelenbos, 2014), coordinators' skills in generating connections inside the network seem to be particularly important for learning. It highlights the importance for coordinators to leave space for informal exchanges and involve themselves in those exchanges.

Empirically speaking, three implications result from the specificities of the cases compared in this research. First, they were only composed of public officials, which limits the levels of diversity compared to collaborative networks with external stakeholders, and in turn limits the external validity of this study. However, this interestingly creates a situation of 'passed least-likely test' (Rohlfing, 2014): even in a limited amount, diversity bears an important learning potential. Second, the networks studied occurred at the local level, whereas collaborative networks exist at other levels of government. This could increase the likelihood of trusted relationships between participants, which is known to favour learning. Third, the issues addressed in the network might play a role (Newig et al, 2023), as learning tends to be more

difficult for sensitive issues. Discrimination touches upon deep core beliefs such as opinions on equality, that are, by definition, more resistant to change (Sabatier and Jenkins-Smith, 1993). In comparison, public procurements issues are more technical and can be considered secondary beliefs, generally easier to update. That said, the frontier between political or technical issues is highly permeable.

Methodologically, there are promising avenues for future research. First, a qualitative analysis does not necessarily control for all other variables which are known to co-influence the dependent variable. For example, in these two cases, the frequency of interactions between participants was different. This variable alone, i.e., independently from diversity, could account for collective learning together with diversity and diversity-interactions relationships. Quantitative research is necessary to confirm the results of this study. Second, the mental model approach to the measurement of learning addresses issues raised by existing approaches (see, e.g., Squevin *et al.*, 2021; Zaki, Wayenberg and George, 2022), because it avoids imposing the cognitive constructs of the researcher to the research participants when examining the nature and evolution of their beliefs. However, our method analyses the emergence of collective learning, not its sources. In other words, it does not measure who learns from who, and therefore why some beliefs were endorsed and others marginalized. It does not make power dynamics visible. An Exponential Random Graph Modelling methodology could be used to make inferences about the drivers of learning operationalized with mental models.

To conclude, diversity creates potential for learning in a collaborative network, but that link is far from automatic. It must be meaningful to the objective or topic of the network to create real learning opportunities, and it requires intense and equitable formal and informal interactions to transform these opportunities into concrete collective learning.

Notes

[1] Regional law of the 4th of September 2008 aimed at ensuring diversity within the public services of Brussels.

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Conflict of interest statement

The authors declare that there is no conflict of interest.

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Appendix A. Example of a mental model as elicited during an interview

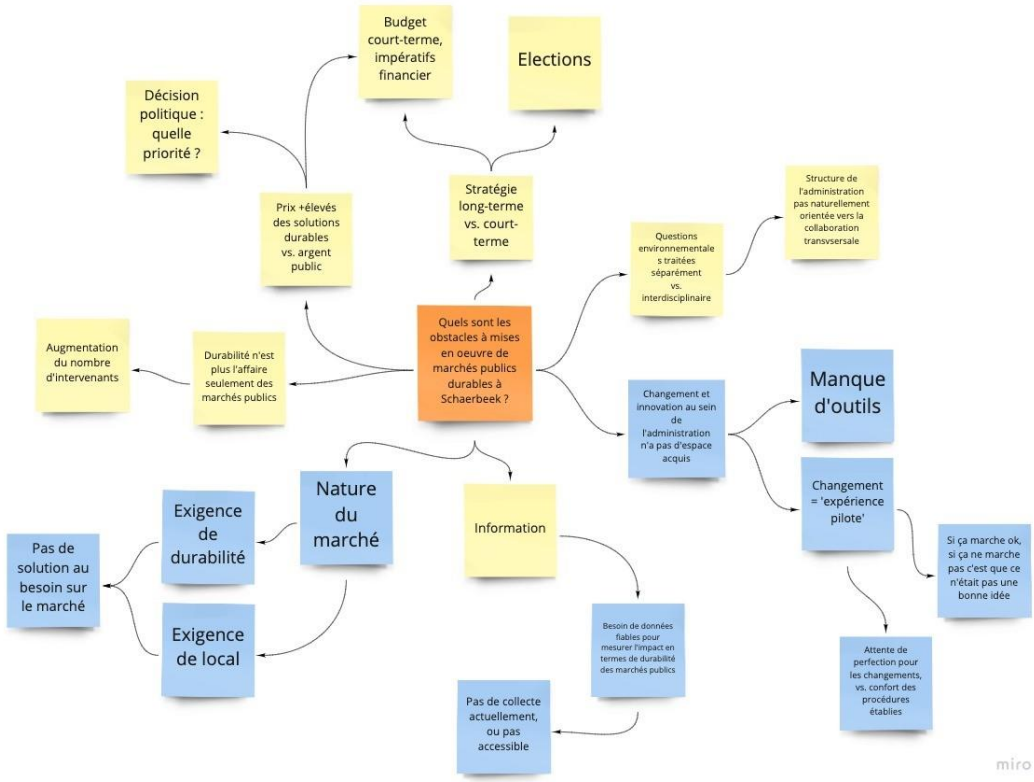

Figure A1. Mental model of Participant 10 in the SPP network

Appendix B. Objective diversity in the two networks

	SPP network (12 members)	**Antidiscrimination network (13 members)**
Gender	5 Male – 7 Female – 0 X ***Blau index = 0.49***	3 Male – 10 Female – 0 X ***Blau index = 0.35***
Age	Younger than 20 yo.: 0 20-29 yo.: 1 30-39 yo.: 6 40-49 yo.: 5 50-59 yo.: 2 Older than 60 yo.: 0 ***Blau index = 0.54***	Less than 20 yo.: 0 20-29 yo.: 1 30-39 yo.: 5 40-49 yo.: 2 50-59 yo.: 3 Older than 60 yo.: 0 ***Blau index = 0.73***
Educational Background	Social sciences: 7 Law: 1 Literature/languages: 1 Sciences: 2 Field work: 0 Other: 1 (Architecture) ***Blau index = 0.61***	Social sciences: 7 Law: 2 Literature/languages: 1 Sciences: 2 Field work: 1 Other: 0 ***Blau index = 0.65***
Hierarchical level	A: 12 B: 0 C: 0 D: 0 E: 0 ***Blau index = 0***	A: 9 B: 2 C: 2 D: 0 E: 0 ***Blau index = 0.47***

Table B1. Objective Diversity in the two networks

Appendix C. Tables of Social Network Analysis indicators

	SPP network	Anti-discrimination network
Density of the network	0,52	0,38
Degree centralization	0,42	0,40
Closeness centralization	0,55	0,52
Eigenvector	0,44	0,50
Betweenness centralization	0,11	0,15

Table C1. Social network analysis: network-level metrics

Assortative scores:	SPP network	Antidiscrimination network
Gender	-0,08	-0,19
Age	-0,11	-0,10
Department	0,04	-0,05
Educational background	-0,11	-0,09
Hierarchical level	0	-0,16
Seniority	-0,08	-0,02

Table C2. Assortative scores in the two networks

	Closeness	Eigenvector	Betweenness
Individual 1	0,07	1,00	0,06
Individual 2	0,05	0,66	0,01
Individual 3	0,05	0,36	0,01
Individual 4 (Coordinator)	0,07	0,90	0,09
Individual 5	0,08	0,90	0,25
Individual 6	0,05	0,00	0,00
Individual 7	0,06	0,51	0,06
Individual 8	0,05	0,19	0,005
Individual 9	0,06	0,23	0,006
Individual 10	0,06	0,60	0,03
Individual 11	0,06	0,35	0,003
Individual 12	0,04	0,00	0,00
Individual 13	0,06	0,46	0.07

Table C3. Table of most connected individuals in the antidiscrimination network

	Closeness	Eigenvector	Betweenness
Individual 1 (Coordinator 1)	0,09	1,00	0,22
Individual 2 (Coordinator 2)	0,08	0,93	0,12
Individual 3	0,07	0,81	0,08
Individual 4	0,07	0,80	0,07
Individual 5	0,07	0,74	0,05
Individual 6	0,07	0,66	0,03
Individual 7	0,07	0,61	0,02
Individual 8	0,07	0,59	0,01
Individual 9	0,06	0,56	0,01
Individual 10	0,06	0,47	0,01
Individual 11	0,06	0,47	0,003
Individual 12	0,06	0,38	0,00

Table C4. Table of most connected individuals in the SPP network