The interplay of determinants of network effectiveness: A comparative study of health promotion networks

Running title: Interplay of determinants

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Abstract

Interorganizational networks have become increasingly important as policy tools to address complex social and health problems, such as physical inactivity. However, despite the broad literature on network effectiveness, there is still insufficient insight into the environmental, structural and managerial determinants of whole network effectiveness, and particularly on how these determinants are related. The 13 mature whole networks for local health promotion in Flanders were selected as cases for which data were collected through interviews and surveys. Based on the conceptual model of Parent and Harvey (2009), potential determinants were identified. Cases could be identified as effective or not and key determinants and configurations of determinants could be identified using qualitative comparative analysis (QCA). The overall configuration for network effectiveness including the following determinants: political and exposure motives of network partners, network governance, commitment of the network partners, staff quality, and personal contact with other representatives.

The interplay of determinants of network effectiveness: A comparative study of health promotion networks

Introduction

The potential of networks for addressing complex –'wicked'- social problems has been recognized (Provan, Beagles, Mercken, & Leischow, 2013). Among others, this is one of the reasons that governments and public agencies are engaging increasingly in collaborations, such as networks, alliances, or partnerships with public, non-profit, and for-profit organizations (Chen & Graddy, 2010). As a result, networks are already fully integrated in health and social care, local development and education (Turrini, Cristofoli, Frosini, & Nasi, 2010). At the local level, networks of social service providers have become a popular means for the delivery of publicly funded health and social services (Graddy & Chen, 2006). They have the ability to spread relevant information, offer support and disseminate evidence-based programs to the community through a wide range of organizations (Roussos & Fawcett, 2000). Although research on interorganizational relationships and networks has been expanding (Lewis, 2011), and literature on network effectiveness, in particular, is extensive (Turrini, et al., 2010), there is limited understanding of the determinants influencing effectiveness of networks (Kenis & Provan, 2009). Reasons can be found in the dominant focus of network research on structural features, such as centrality, density, frequency of contacts, types of partnership, and tie characteristics (e.g. Provan, et al., 2013; Rethemeyer & Hatmaker, 2008; Robins, Bates, & Pattison, 2011; Saz-Carranza & Ospina, 2011). Further, there is limited empirical evidence of effectiveness on the network and community level (Provan, Fish, & Sydow, 2007; Raab & Kenis, 2009; Saz-Carranza & Ospina, 2011), and a scarcity of whole network studies with a comparative case study design (Provan, Huang, &

Milward, 2009; Raab & Kenis, 2009; Saz-Carranza & Ospina, 2011; Schalk, Torenvlied, & Allen, 2010). At first sight, our study repeats the research question of many others (M. P. Mandell & Keast, 2008; Provan & Milward, 2001; Willem & Lucidarme, 2013): "What are the determinants of network effectiveness?"; but this study extents the work of others by addressing some of the persistent shortcomings. Firstly, this study adds empirical evidence to the literature on effectiveness of whole networks by means of multiple case study research in which a cluster of mature networks that aim for the same network goal and work under similar conditions are compared. Secondly, a multidimensional approach is used, including different dimensions, namely antecedents (including environmental and structural determinants), managerial determinants, and evaluation. Hence, the often understudied management dimensions receive proper attention. Thirdly, the study distinguishes itself by using objective effectiveness measurements at the network and community level.

In the next paragraphs, the research context is broadly sketched and an outline of the theoretical background is given, based on the conceptual model of Parent and Harvey (2009). In the methodology section, the different networks under study are described and the research methods used to answer our research question are explained. We then document our results in a qualitative manner and elaborate on the configurations of the most important determinants of effectiveness of health promotion whole networks. Finally, in the discussion, we discuss the configurations found and conclude by highlighting the study's contributions, practical implications and limitations.

Collaborative public networks

Public networks are long-term relationships of intersectoral, governmental agencies at different levels – central, regional, and local -, and non-profit organizations that collaborate in public policy-making or act as an structural entity through which information, public goods or

services may be planned and realized (McGuire & Agranoff, 2011). Here the focus is on collaborative networks (Rethemeyer & Hatmaker, 2008) whereby the collective action or general network goal exceed the individual organizations' goals. Typically, collaborative public networks are mandated and intend to implement policies or provide services (Agranoff, 2003; McGuire & Agranoff, 2007). Many professionals, policy-makers, and researchers are convinced that collaborative networks have the potential for effective policy implementation while still maintaining satisfactory organizational and professional autonomy. Network collaboration can facilitate information sharing, mobilize additional resources, reduce gaps and overlaps in existing services that result in better client services, and can improve coordination of services leading to a more effective and less expensive system and, thus, more positive outcomes (Poole, 2008; Provan & Milward, 2001; Turrini, et al., 2010).

According to Provan and Kenis (2008) three basic governance forms exist to govern collaborative networks; namely, shared governance among network members, the network governed by one lead member, and delegation of its governance to a Network Administrative Organization (NAO). The NAO is a separate entity established for the sole purpose of governing and managing the network, which implies that the network is governed externally. This study focusses solely on the NAO-governed network form, whereby here the NAO is a government mandated agency.

Effectiveness of networks

Turrini, et al. (2010, p. 529) described network effectiveness as the effects, outcome, impact and benefits that are produced by the network as a whole and that can accrue to more than just the single member organizations in terms of increasing efficiency, client satisfaction, increased legitimacy, resource acquisition, and reduced costs. This perspective on network effectiveness has been adhered by a lot of researchers in the public management and public

policy field (McGuire & Agranoff, 2007; Milward & Provan, 2003; O'Toole & Meier, 2004; Provan & Milward, 1995), and we also want to endorse this definition of network effectiveness.

Assessing network effectiveness is more complex than evaluating a single organization (Shonk & Bravo, 2010). Numerous researchers agree that the traditional outcome measurements are insufficient to assess network performance (Flynn, Pickard, & Williams, 1995; Mayne, Wileman, & Leeuw, 2003; Ryan & Brown, 1998). As a result, many different approaches to assess network effectiveness have been suggested (Turrini, et al., 2010). A first approach on network effectiveness is measuring the extent to which a network achieves its goals (McGuire & Agranoff, 2007). A second approach refers to the importance of process measurements (Head, 2008; M. P. Mandell & Keast, 2008) and the multidimensionality of network performance (O'Toole, 1997; Provan & Milward, 1995). Provan and Milward (2001) conclude that network effectiveness largely depends on the stakeholder perspective and suggest three levels of network effectiveness: the community level, the network level, and the organizational level.

Adding further to Provan and Milward's framework, Head (2008) made the transition between the levels of evaluation and the actual effectiveness measurements by stating that each of the three levels should be measured by both process and outcome criteria. Recently, Turrini, et al. (2010) conducted a thorough literature review on the determinants of network effectiveness. They found three large groups of characteristics that influence networks effectiveness: network structural characteristics, network functioning characteristics, and network contextual characteristics. However, most studies that were included in their review only measured some of these characteristics and did not take potential interaction effects among the different determinants into account. There is, thus, a need for more multidimensional models of effectiveness that include among other network characteristics,

managerial actions in the network, the environment in which the network operates, and outcome measures of the whole network (McGuire & Agranoff, 2007). Hence, despite the large amount of literature on networks, very little is known about the determinants and their interrelatedness that influence performance of networks, while many organizations and networks would benefit from more systematic empirical investigations (Chen & Graddy, 2010).

The model of Parent and Harvey (2009) is, to our knowledge, the only specific theoretical model for physical activity community-based partnerships. It is used here as a starting point for this research because it is a holistic model based on a thorough literature review that includes several dimensions of effectiveness, in particular: structure and environment, management, and evaluation of the network (Parent & Harvey, 2009). See figure 1 for a schematic outline of the model. The next section gives an overview of the current state of the public management literature for each determinant.

Insert figure 1 here

Network antecedents

In the antecedents section, three large constructs are included: the project purpose or network goal, the environment, the partnership structure.

Network purpose

The first determinant is the project purpose or network goal. Provan and Kenis (2008) make a distinction between serendipitous networks, which are opportunistic build, and goal-directed networks, which are set up with a specific purpose. In public management, often only the last group, is acknowledged as a real network (McGuire & Agranoff, 2007; Moynihan, 2009; Provan & Kenis, 2008) from the perspective that public managers frequently have to deal with

complex issues that can only be addressed by a collective approach (O'Toole, 1997; van Bueren, Klijn, & Koppenjan, 2003). In the network effectiveness discourse, agreement on the network goals is considered as a crucial determinant (Kenis & Provan, 2009; McGuire & Agranoff, 2007; McGuire & Agranoff, 2011; Provan & Kenis, 2008; Robins, et al., 2011; Saz-Carranza & Ospina, 2011). Especially, conflicts between the individual organizational goals and the network goal hamper performance of the network (M. P. Mandell & Keast, 2008).

Environment

The second determinant, Environment, refers to the global context of the network. As networks are embedded in the real world, political, social, cultural, economic, demographic, juridical, and technological factors of the environment are likely to influence the functioning and, eventually, the effectiveness of the network (M. P. Mandell & Keast, 2008). As a result, a good understanding of the environmental context is essential to analyze network effectiveness (McNamara, 2012; Rethemeyer & Hatmaker, 2008). In the network literature, interactions between the contextual environment and network management, network processes or other network features are mentioned (McNamara, 2012; Meier & O'Toole, 2003; Mohr & Spekman, 1994; O'Toole & Meier, 2003). Environment is a very broad and network specific determinant. What may influence one network, may not be relevant for another (O'Leary & Vij, 2012), therefore, the model recognizes its importance, but doesn't go into depth in the different aspects of the contextual features.

Partnership Structure

All partners bring their own values, aims, governance, resources, knowledge and culture to the network (O'Leary & Vij, 2012). Therefore, a good composition of network partners is required to have both sufficient capacity to address the network goals and enough common ground to enable cooperation (Robins, et al., 2011). Selecting the right partners for the

network is crucial and is included in the determinant Complementarity and Fit (Agranoff & McGuire, 2001). Not only the organizational characteristics and competences are important for network cooperation, also the motivation for network participation is recognized in the literature and encompassed in the model of Parent and Harvey (2009). Organizations enter partnerships when they expect organizational benefits (McNamara, 2012; Provan & Kenis, 2008; Voets, Van Dooren, & De Rynck, 2008), such as higher reputation (Chen & Graddy, 2010), acquiring information or knowledge (Hudson, 2004), for resource exchange (Saz-Carranza & Ospina, 2011), to rely on others as their organizational goals have grown too complex to achieve independently (Rethemeyer & Hatmaker, 2008), or when legislations or regulations encourage network formation (Voets, et al., 2008). In the public service delivery context, Chen and Graddy (2010) made a distinction between two broad motivations: to obtain resources to meet programmatic needs, and to achieve individual organizational goals.

Next to bringing the right partners together with the right motivations, network partners and administrators need to select the most appropriate type of partnership and governance to achieve the desired network outcomes. A sustainable collaboration can only be achieved if a network arrangement is build that can manage diversity and builds on the existing skills in the network (Head, 2008). In the public management literature, all sorts of typologies can be found that sort networks according to divers elements, such as their governance mechanism (Provan & Kenis, 2008), structural organization (Jordan & Schubert, 1992), the lifecycle of networks (M. P. Mandell & Keast, 2008), action level (Agranoff, 2003), and functional roles (Head, 2008).

Closely related to the network type and also an important determinant of network effectiveness, is the way the network is governed (Provan & Lemaire, 2012). Central in this is the delineation of roles, responsibilities and decision-making among the partners (Provan, Beagles, & Leischow, 2011) to ensure that participants engage in the network, that conflicts

can be addressed, and that network resources are used efficiently (Provan & Kenis, 2008). The form of governance is likely to be influenced by the network structure, the network goals or purpose and required network processes (Head, 2008; McGuire & Agranoff, 2007). Governance can be formalized in contracts and written guidelines or can be made informal. Mandated networks or networks with public agencies as members are likely to lean on formal documentation to specify rules, responsibilities, and accountabilities for expenditure (Head, 2008). However, some authors are convinced that the need for formal agreements evolves over time as personal relationships and trust increasingly supplement formal roles and psychological contracts substitute for formal legal contracts (Ring & Vandeven, 1994).

Network management

Parent and Harvey (2009) have identified three parts in the management dimension of the model: the attributes of the partnership, communication and decision-making.

Attributes of the partnership

In this section, determinants that characterize the relations in the partnership are included. The first determinant is commitment which covers the willingness and belief of network partners that the relationship is worth the efforts (Mohr & Spekman, 1994; Morgan & Hunt, 1994). According to M. P. Mandell and Keast (2008), commitment among participants is the glue that keeps the network together. Hereby, leadership plays an important role in establishing and maintaining commitment (McNamara, 2012; Meier & O'Toole, 2003; Rethemeyer & Hatmaker, 2008). The next partnership characteristic is Coordination which refers to the set of tasks and information sharing required to steer network efforts towards the network goals (Mohr & Spekman, 1994) or making the connection between resources and processes to achieve desired outcome (Jennings, 1994). Some examples of coordination tools are regular meetings, workshops, joint planning, or training programs (Jennings, 1994).

The third characteristic is Trust which is a well-discussed determinant in the public management literature. It can be defined as the confidence of each partner in the abilities and the intentions of the other network partners. Trust is known to play an important role in facilitating the network dynamics and steering the network (Provan & Kenis, 2008) by helping to maintain cohesion among network members (Agranoff & McGuire, 2001), to avoid potential conflicts and to achieve collaboration (Ring & Vandeven, 1994). Trust cannot be taken for granted, it needs to 'grow' through a confidence-building process, a process of mutual learning or through progressive accomplishments (Agranoff, 2003; Head, 2008). Having a good level of trust contributes irrefutable to network effectiveness (R. Keast, Mandell, Brown, & Woolcock, 2004).

Network identity includes core values, mission and ideals of the network (Parent & Harvey, 2009). A strong network identity is an unifying factor just as a common network goal (Saz-Carranza & Ospina, 2011). However, organizations may fear that collaboration in a network will result in a loss of their own organizational identity (Lee, et al., 2012). Literature shows that a collective identity is easier to obtain in networks that achieve objectives that each individual partner could never have produced on its own (McNamara, 2012). Having a clear network identity is crucial for the functioning of the network.

Organizational learning is considered to be a determinant of network effectiveness because through partnerships, organizations learn to work with others which may increase their capacity to compete effectively for future contracts and improve the ability to achieve missions and goals (Chen & Graddy, 2010). During partner interactions, they learn to develop and review common goals, adjust strategies, build long-term relationships, avoid a culture of blame, provide sufficient time for processes to work, and deal with the dual identity of the partners (Head, 2008). Agranoff and McGuire (2001) draw a parallel between 'organizational learning' and the 'learning organization' (Senge, 1990, p. 3) whereby learning occurs during

the discussion processes and collective aspirations drive people to ‘expand their patterns of thinking’ and ‘learn how to learn together’.

Mutuality describes mutual dependence or interdependence of the network partners. Lipnack and Stamps (1994) identified five key features of mutuality: unifying purpose, dependent members, voluntary links, multiple leaders, and work at integrated levels. One type of mutuality is resource interdependency, which is commonly observed in partnerships with government funders and private social service providers whereby the public organizations depend on social service organizations for their service delivery capacity, and providers depend on public organizations for clients and revenues (Graddy & Chen, 2006).

The next determinant, Synergy, describes the complementary character of the participants so ‘more is done with less’(Parent & Harvey, 2009). By combining their efforts, partners in the network realize more meaningful programs, increase their power because the outside world sees the network members as one large group (R. Keast, et al., 2004). Agranoff and McGuire (2001) stated that synergy arises from commitment and interaction between organizations that stimulate alternative thinking. Synergy was also found to be closely related to leadership effectiveness and partnership efficiency (Weiss, Anderson, & Lasker, 2002).

The last attribute of partnership is Staffing. Although the networks are composed of organizations, the daily and real-life interactions between these organizations go through representatives of each individual organization. The individual competences (e.g. expertise, skills, …) and commitment of each of the representatives of the network partners influence the overall effectiveness of the partnership (Robins, et al., 2011). Not only the objective quality of the staff is important, but also the way representatives perceive each other has influences (Hudson, 2004). If individuals get the chance to gradually learn to know each other through open and frequent communications, the perception of other representatives evolves

positively (Hudson, 2004; McNamara, 2012). Selection of the representatives is considered to be crucial (Todeva & Knoke, 2005).

Communication

The second part within the management section of the model of Parent and Harvey (2009) covers the quality, information sharing, and participation in the communication within the network. These three determinants answer respectively the how, what and who in network communication. Mohr and Spekman (1994) consider accurateness, timeliness, adequacy, and credibility of information as features of communication quality. Information sharing is seen as the production and distribution of information necessary to accomplish the collective objectives (McNamara, 2012). Participation is conceived as the presence of joint planning and goal setting (Parent & Harvey, 2009). Since communication underpins all actions of coordination and integration in the network, it is considered crucial in network effectiveness (Mohr & Spekman, 1994; Turrini, et al., 2010). The public network literature emphasizes open and frequent communication to foster mutual understanding, knowledge creation, organizational learning, and to reduce power imbalances; while at the same time, it is recognized that, joint procedures, alignment of collective and individual interests, and high levels of trust may be needed to enable open communication (Jackson & Stainsby, 2000; Robyn Keast, Brown, & Mandell, 2007; M. Mandell & Steelman, 2003; Morgan & Hunt, 1994).

Decision making

Participation in decision making is very important for partnership effectiveness (Graddy & Chen, 2006). Therefore, Decision making is included as the last part of the management section of the conceptual model. The construct consists of four variables, namely Structure, Conflict resolution, Power balance and Leadership.

Caudle (2007, p. 42) described decision making structure as the whole of "*processes and capabilities that govern partnership decisions, allocation of resources to implement the decisions, and resolution of the unavoidable conflicting priorities and concerns within the partnership*". In brief, the decision making structure can be described as the way a complete set of decisions is reached. It was shown that this structure varies according to the form of governance of the networks (Provan & Kenis, 2008).

Bringing together different representatives of divers organizations for joint decision making and goal attainment, implies several perceptions and expectations of the network from both inside as outside the collaboration (M. P. Mandell & Keast, 2008). The differences are sources of potential conflicts, which is intrinsic to the very structure of the network system (Borzel, 1998). Although positive effects of conflicts, or even its necessity, is advocated in the network literature (Hudson, 2004; Provan & Kenis, 2008), clear agreements for conflict resolution are necessary (Head, 2008; M. P. Mandell & Keast, 2008). Mohr and Spekman (1994) identified five different methods for conflict resolution: joint problem solving, persuasion, smoothing, domination, harsh words, and arbitration. They found joint problem solving to enhance partnership effectiveness. If relations between members are poor, the use of persuasion and influence is often adopted (M. Mandell & Steelman, 2003). Research revealed that this is generally less detrimental than the use of domination or other negative forms of problem solving (e.g. ignoring the problem) (Mohr & Spekman, 1994). Finally, the use of arbitration through a third party can be helpful for a particular conflict episode but cannot be considered as a long-term solution (Mohr & Spekman, 1994).

The search for a good conflict resolution method is affected by the absence of the typical forms of power in network structures (R. Keast, et al., 2004). Although core features of networks are the egalitarian structure and absence of formal authority, this does not eliminate the influence of power (Agranoff & McGuire, 2001). Formal types of power, such as

representing scarce resources or organizational size, are supplemented with informal power based on interpersonal relations (Agranoff & McGuire, 2001; R. Keast, et al., 2004; Provan & Kenis, 2008). At the interpersonal level, network relations can be affected by differences of race, age, sex and class (Hudson, 2004). In the network literature, a distinction is made between 'power to', referring to the ability to getting things done, and 'power over', which implies controlling the other (Agranoff & McGuire, 2001). The first type of power is most related to network cooperation, although some 'controlling power' might be necessary too (Heen, 2009). A general assumption is that smaller power differences will foster network cooperation (Huxham & Beech, 2002).

The last variable that is included in the decision making construct, is Leadership. This is one of the most discussed subject in the interorganizational network research (for an overview, see Muller-Seitz, 2012). Because leadership has been discussed in many research domains from different perspectives, it is important to give a description of what is meant here. One part of the literature refers to leadership as the facilitating role of the network manager for whom specific personal characteristics and interpersonal skills are described (Heen, 2009; O'Leary & Vij, 2012; Turrini, et al., 2010; Weiss, et al., 2002). Another part of the literature sees leadership as a form of coordination that shapes the overall conditions under which the network operates and guides the activities of the independent organizations (Muller-Seitz, 2012). In this research, leadership will only be interpreted as this coordination form.

Method

We explored the key determinants of network effectiveness and their interrelatedness based on the model of Parent and Harvey (2009). A qualitative research strategy was chosen to collect data in a multiple case study setting. Cases were health promotion networks and data were collected through interviews with several partners in the networks. The unit of analysis

was the networks and data were analyzed using NVIVO and Qualitative Comparative Analysis (QCA).

Study population

To pursue governmental health objectives, such as vaccination and alcohol- and substance abuse, the Flemish government mandated in 1998 the Local Health Platforms (LHPs). These networks' main tasks were to implement governmental developed health programs based on collaboration between the community, local service providers and other interested organizations. Initially, 25 networks were created in defined geographic areas throughout the entire region of Flanders. However, the number of LHPs was reduced from 25 to 13 geographically connected networks in 2009. The daily management of each LHP was under control of a coordinator and a team of professional staff members which made up an autonomous non-profit organization. According to the network governance typology of Provan and Kenis (2008), the 13 LHPs were managed and governed by Network Administrative Organizations (NAOs). Intrinsic to this governance type, activities and key decisions were coordinated through the NAOs although network participants may interact with each other (Kenis & Provan, 2009). Further, a distinction had to be made between network members and project partners. The network members were organizations that had an enduring commitment in the LHP and were principally represented in the executive board of the LHPs. Those network members were to a large extent mandated by the government, such as local municipalities, local social services, or primary health care circles. The project partners were organizations that only collaborated in the LHP for specific health objectives or programs, because of their expertise, work area or organizational aims. Some LHPs had a more or less stable network with for the greater part network members and a few project partners, while other LHPs had a large group of really specialized project partners for each

health objective. In summary, the LHPs were all mandated based on the same regulations, basic funding, and conditions concerning network member selection. At the same time, the networks were very divers due to geographical differences, but also due to the selected partners, or way the networks were managed. This diversity made the LHPs an interesting context to explore network effectiveness.

Data Collection

Network effectiveness

To be able to assess the outcome of the networks, we focus on one specific program that was mandated to all LHPs, namely the evidence-based physical activity program '10,000-Steps'. This program was developed to stimulate people to be more physically active in their daily life by encouraging them to take 10,000 steps a day (Van Acker, De Bourdeaudhuij, De Cocker, Klesges, & Cardon, 2011). This program was chosen because it was a delimited program with a clear start date for which outcome could, thus, be assessed more easily than for other more vague or long-term programs. To get this program broadly implemented, most LHPs attracted additional project partners with experience in the PA domain. The most common PA partners were the local sport services - which are located in each municipality - and local sport clubs. However, the '10,000 Steps' program also attracted less obvious partners, such as tourist offices, large companies, cultural organizations, or community centers.

The assessment of the network outcome included measurements on both community level and network level. At community level, we used two output measures, namely A*wareness* and C*hange in awareness*. The variable *Awareness* indicated the percentage of inhabitants that knew the program after one year of implementation and the variable *Change in awareness* indicated the difference in percentage of people knowing the program after three years in

comparison with the percentage of awareness after one year. The awareness of the '10,000 Steps' program was measured in 2009 and in 2011 in completion of the project (see results in: Cardon & De Bourdeaudhuij, 2011; Ragnar Van Acker et al., 2011). All data of these studies were available for us to use. It was proven that the general implementation strategy of '10,000 Steps' was considered effective in the entire region of Flanders with an overall score on program awareness of 59.2% after three years (De Cocker, De Bourdeaudhuij, Brown, & Cardon, 2011). However, differences between the networks were found between the regions of the LHPs which might be explained by the network effectiveness in implementing the program.

At the network level, *City participation*, *Municipal actions* and *Regional actions* were included. C*ity participation* was chosen as an indicator for the geographical distribution of the partners in the network and was defined as the percentage of cities, located in the network region, where at least one partner was located. We assume that the larger the spread throughout the region, the more likely people got in touch with the program. *Municipal actions* was calculated as the proportion between the amount of local actions delivered by the network and the number of municipalities in the LHP. The variable *Regional actions* gives the number of regional actions that were organized by the LHP. The more municipalities participated in these regional actions and the more actions organized, the more successful the network in mobilizing its partners.

We combined the five outcome measures to make a distinction between high effective and less effective LHPs for the implementation of the '10,000-Steps' program by use of the median of all five outcome measurements. As a result we subdivided our sample in 7 high effective and 6 less effective networks.

Network characteristics

We developed an original template to collect data on the descriptives of the LHP's and their network partners. The template contained sections on the NAOs and on the partner organizations. The template data were supplemented with information from official documents and websites (Belgian Federal Government, 2010; Flemish Institute for Health Promotion and Ilness Prevention, 2012) and financial information on the LHPs obtained from the VIGeZ, the Flemish umbrella organization for all LHPs. The template was emailed to each LHP and all 13 templates were completed and returned.

Network measurement

An interview scheme was comprised based on the conceptual framework of Parent and Harvey (2009) and an additional thorough literature review of the included determinants (e.g. K. M. Babiak, 2009; Hausman & Johnston, 2010; Head, 2008; R. Keast, et al., 2004; M. P. Mandell & Keast, 2008; McAllister, 1995; Mohr & Spekman, 1994). Data on the determinants were obtained through semi-structured interviews with both the NAOs and network partners. Information on the NAOs was collected in 13 face-to-face in-depth interviews, attended by at least two employees; mostly the network coordinator and the responsible employee for the 10,000 Steps' program. The average duration of the interviews was 1 hour and 15 minutes. Data on the network partners was gathered through 39 telephone interviews with three randomly selected partners involved in the 10,000 steps program of each LHP. The initial questions in the interview guide of the NAOs were reformulated to semi-open questions to keep the telephone interviews as concise as possible. The interviews had an average duration of 17 minutes. All personal and telephone interviews were recorded with the approval of the participants and transcribed to the letter.

Data Analysis

Firstly, all interviews were coded in NVivo 9. Hereby, most of the variables were deductively coded based on the conceptual framework of Parent and Harvey (2009). But, also new determinants were added during coding when new elements recurred in several interviews or when certain variables needed some refinement. For example, the original variable *Partners motives* was subdivided into *Exposure motive*, *Policy motive*, *Means motive* and *Political motive*. An example of a new determinant is *Spaciousness* - namely, the size of the geographical working area -, which was not included in the model, but was observed as a relevant determinant. In total an exhaustive list of 42 variables with potentially explanatory power was constructed.

Our research is a multiple case study with a natural limited study population - there are only 13 LHPs – while the number of potentially explanatory and condition variables was relatively large – see model of Parent and Harvey (2009). Under these circumstances, De Meur, Bursens, and Gottcheiner (2006) suggest the application of two qualitative comparative techniques: MDSO/MSDO and Crisp-set QCA. This method is already frequently applied in the literature (e.g. Baltzer, Westerlund, Backhans, & Melinder, 2011; Basurto & Speer, 2012; Crawford, 2012; Soda & Furnari, 2012). Both techniques allow only binary variables. Continue variables were dichotomized at the median.

The MDSO/MSDO method was used to detect those determinants that contribute to a high effective or less effective implementation. Thus, the technique reduces the number of determinants by only selecting those variables that influence the outcome, both positively and negatively.

After reducing the determinants with MDSO/MSDO, we used QCA method to reduce the complexity and find general patterns in the remaining variables related to a certain outcome.

With this method, determinants are explained as interconnected structures that lead to a certain outcome (Rihoux & Grimm, 2006). All antecedents and management determinants that showed their relevance in the previous minimizations were used for further analyses which eventually resulted in a single minimal configuration of determinants.

Both MDSO/MSDO and QCA were used to reduce the complexity of the cases. However, the richness of the data is important here and we continue with the limited set of determinants and configurations to explore these and their interrelatedness more in-depth.

Results

Descriptives

In total 78 full time equivalent employees (FTE) were employed in the NAOs of the LHPs with a range from 1 to 10 FTEs (μ = 6). We also found large differences in the available budgets for the 10,000 Steps program; the mean budget was € 38,000 with a minimum of € 23,768.43 and a maximum of € 76,566.31. The global number of partners for the 10,000 Steps program, both the network members and project partners, ranged from 7 to 60 with a mean of 30. The LHPs had a total of 387 partners for the 10,000 Steps program of which 160 were network members and 227 were project partners. Among them, we could distinguish three main groups; 12.8 percent were health-related organizations, 42.1 percent were social organizations and 20.5 percent were PA organizations. Some examples of the remaining 24.7 percent of organizations were schools, tourist centers, private companies, and leisure non-profit organizations.

During the three years of the program, a total of 871 actions were undertaken by all the LHPs to get the program implemented. For each LHP the number of actions ranged from 6 to 138 (μ

= 67). Some examples of actions are organized hikes, spreading leaflets, installing fixed signposts, or organizing workshops.

Based on the qualitative analyses of the interviews and the document analyses, we composed an exhaustive list of 42 variables that had the potential to explain why some network were more effective in implementing the '10,000 Steps' program than others. We started the MDSO/MSDO-analyses with 42 variables and reduced the shortlist to 24 variables by only selecting those variables that contributed to a certain outcome . This shortlist resembles those determinants that directly influence the outcome of both the high successful and less successful networks.

The variables that had been dropped showed no clear link with any outcome. The most effective networks were characterized by a certain pattern of variables that reoccur in each of them. If we can identify the pattern with the least variables that can clearly distinguish the most effective networks from the less effective, we have found the 'minimal formula' as it is called in the QCA method. Because of the low number of cases (n=13), we cannot analyze all 24 remaining variables at once. Therefore, the classification in the model of Parent and Harvey (2009) was further used for the different QCA analyses. The results of the minimizations are shown in table 1.

Insert Table 1 here

The first QCA analysis on the remaining environmental variables revealed that implementation success was most likely in networks without a large city, with positive merger effects, and with a low population density or with a relative small geographic area. The configuration of structural characteristics that lead to implementation success included the presence of the exposure motive or the presence of political motives and written contracts. When combining the environmental and the structural variables into the antecedents category,

implementation effectiveness was reached in networks with partners that had exposure motives and in networks with written contracts, but without a large city or with partners with political motives.

The analyses of the variables of the attributes of partnership showed that effective networks had high levels of commitment and high quality staff and had good coordination or lacked synergy. The communication variables for effectiveness were reduced to a single variable, namely personal contact. The effective configuration of the decision making variables was more complicated. All effective networks had a horizontal structure, but in effective networks with an equal power balance and shared leadership, the joined conflict resolution was missing; and in effective networks with a joined conflict resolution, the power balance and shared leadership was missing. The global analysis of the management variables indicated that an effective network had high levels of commitment and personal contact or high levels of commitment and high quality staff, but without synergy.

The smallest configuration for a high effective implementation was calculated by combining the antecedents and management variables into the final csQCA analysis. The most effective networks: did not have a large city in their area, had a high quality staff, had high commitment among the network partners of which some had a political and an exposure motive or had a political motive, written contracts, and personal contact between the representatives.

A closer look at the interrelatedness of key determinants

A total of 16 different variables appeared in the different csQCA configurations. In the next paragraphs we illustrate and explain these different minimizations by focusing on the qualitative content (see table 1).

The stimulating and hampering effects of the network environment

The network environment is a constant factor for each organization and collaboration. Most often, the contextual factors cannot be remedied, but nevertheless it is important to detect and manage them as accurate as possible. The environment has been completely changed in 2009 when the initial number of 25 LHPs was reduced to 13. The implementation of '10,000-Steps' started shortly after the reorganization and we found that LHPs that perceived and experienced the merger positively were more likely to have implementation success. All LHPs that benefitted from the merger mentioned that it has given them more scope in terms of staff expansion, and financial means, which resulted in a more efficient deployment of staff and more opportunities to support specific activities. This is illustrated in the following statement of the coordinator of LHP M:

"Previously, we needed to make choices, we had 6 themes to choose from, and so one year we worked on the first three and the next year on the others. But now, after the merger, we have relatively more personnel which means that all themes are handled and each question [from partner organizations] can be answered." (LHP M)

At the same time, some LHPs perceived the merger negatively. Although, we found no direct relation with the implementation success, it is valuable to illustrate what kind of arousal was perceived. Firstly, the differences in cultural background made aggregation difficult. In some LHPs, it took a lot of energy to culturally align the different networks and the people operating in them. In cases where a large network, often with a metropolitan, was merged with smaller networks, the consolidation was perceived as the small ones being wrapped up in the big one. A partner of LHP E put it like this:

"Before the merger, we had our own small LHP. Now, we are absorbed by LHP E, which means we are also dependent on their metropolitan. The consequences are apparent."

Secondly, network partners experienced a shift in involvement of the NAO staff. Before the merger, NAO employees were more present in the field, while afterwards they took a more supporting role. This is probably due to the increase in scale of the LHPs. Finally, the merger also implicated that the connections in the networks changed. Some partners were gone, some personal contacts needed to be (re)built with partners who previously belonged to another LHP or new partners were looked-for.

Next to merger effects, we found that implementation success was most likely in networks without a metropolitan and with a relative small geographic area or with a low population density. The 13 LHPs were geographically very different, for example, one LHP had more than 880,000 inhabitants in 45 municipalities with very rural parts and highly urbanized parts, while another has about 240,000 inhabitants in one regional capital surrounded by 7 smaller urbanized municipalities. During the interviews with the NAO representatives of the networks with a metropolitan, it became clear that they were aware that a large city needs a different approach to get the program implemented, nevertheless, they didn't realize that the different approach for the metropolitan also influenced the implementation in the more rural parts of their region.

"For the metropolitan, we search different approaches. We try to get our message across through less regular channels." (NAO A)

Reasons can be found in the different structural organization of a large metropolitan. They have much more echelons than small municipalities and many more specialized departments, such as the preventive health department and the board of district coordinators. Thus, it takes much more efforts to get a proposal accepted by all parties.

Further, it is shown that when participants are spread out geographically, it is difficult to have regular meetings with all partners, which is perniciously for the efficiency (Provan & Kenis,

2008). Put another way, having a compact area can positively stimulate the effectiveness of the partnership. In our results, the advantages of a small geographical working area were also found, as is illustrated by the quote of LHP L:

"We are very small, but we have the advantage that we can collaborate very intensively with our partners, even with each of them individually…This allows us to do [our job] right."

According to our results, the large size of the network area can be compensated by having a low population density. At first sight, this seems inconsistent since the subsidies are calculated based upon the number of inhabitants, so these LHPs have a large working area but relative fewer means. However, the interviews revealed that municipalities or cities with large populations have their own employees working on health prevention with their own programs, while small municipalities do not have the capacity nor the expertise to organize programs on their own. Consequently, they are more willing and feel more need to engage fully in the LHPs. One of the NAO employees described it as follows:

"In a small municipality, someone is working on special planning, housing bonuses and 5, 6 other things, and on top of that they need to implement '10,000-Steps'. So, those people are looking most for our support…" (LHP J)

And an employee of small municipality supports this: "I was only recently employed as health official in our municipality, so they have invested in personnel, but money is quite a different matter… That's why we collaborate very closely in the LHP, it facilitates us" (partner LHP F)

Network structure influences implementation effectiveness

We noticed variation in the number of partners, in member profiles, and member motivations between the different LHPS. The analyses indicated that implementation success was induced by the presence of members with the exposure motive uniquely and by the presence of members with the political motives combined with written contracts. Although the network

goal is the implementation of the '10,000-Steps' program, network partners also had specific organizational motives to enter the partnership. Two NAO staff members came to the same conclusion that "partners engage in '10,000-Steps' because they believe it can bring some advantage for their organizations or segment…" (NAO E) which is not uncommon, because "…it is a general principle of network collaboration, that you have interests of the partners and individual interests which put some weight on the collaboration."

The exposure motive referred to partners engaging in the program because of the possible positive publicity the program may bring them. The '10,000-Steps' program was promoted in the whole Flemish region, n and received quite some media attention. This was seen by many partners as an opportunity to attach their name to the program. The citation below illustrates that the NAOs directly experienced the presence of the exposure motive: "Local authorities will always do something because of they can present themselves an image, we don't need to have illusions about that." (NAO LHP B) Partners with an exposure motive used the program to show themselves in the best possible light. Therefore, they were highly motivated and made every effort necessary to achieve this.

The political motive refers to the political support or pressure that was experienced by some network partners, especially those connected to municipalities, to engage in the LHPs. We have found a positive effect of political support on program implementation. Below some quotes illustrates the importance of the political motive.

"The engagement of local politicians is important, do they support the engagement, and do they think it is relevant." (NAO LHP L)

"It [network participation] is also a political choice, the alderman or mayor who is supportive…" (Partner LHP F)

"If they [politicians] are convinced that '10,000-Steps' brings added value, … then the chance exist that they will have a longstanding attention for the program, or will also engage in other programs." (NAO LHP B)

Next to the reasons why partners were involved in the LHPs, also the delineation of their involvement in the network was essential for implementation effectiveness. This was shown in the determinant governance, which was narrowed down in our research to the existence or absence of a formal agreement. It was revealed that the LHPs with the lowest success rates were most often lacking formal partnership agreements. In the networks where formal agreements were largely absent, we observed a poorer division of responsibilities, a less clear task delineation and differing expectations of the collaboration. This is demonstrated by a partner of LHP E: "Cor, sometimes it [division of tasks] got blurry, depending on who… but eventually, we strived for clarity."

One LHP experienced the difference between having written and oral agreements within their network. "For the metropolitan, we have our tasks well-defined, and written down, but with our municipalities, it was not always clearly put on paper, and then, you notice often, not often, occasionally that there are different expectations… as long as there are no official agreements, everything is goodwill." (NAO LHP A).

It is clear that efforts and energy spend to align tasks, responsibilities and expectations, once the collaboration has started, cannot be invested in the real network collaboration and eventually hampered implementation success.

Influencing attributes of partnerships

The attributes of partnership are located in the core of network collaboration. The included determinants reflected how the reciprocity between network members and the NAO make the network operational. The perception of the NAO and network members about each other and

the network functioning plays an important role. The analyses of the attributes of partnership showed that successful networks had high levels of commitment and high quality staff and had good coordination or lacked synergy. *Commitment* referred to willingness to exert efforts on behalf of the partnership. The level of commitment is often seen as one of the basic pillars of network working (M. P. Mandell & Keast, 2008). Overall, we have found high levels of commitment which revealed itself in different ways. Firstly, the extent to which partners were prepared to invest organizational means to make to program succeed. Interviews with the NAOs showed that supplementary investments of the partner organizations were necessary in the LHP for '10,000-Steps', often by means of personnel. The NAOs bring the relevant partners together, but that does not mean that the program can be carried out immediately. There is a need for money to engage in the program and on top of that, partners need to exempt some staff members to participate in the network, shape their participation and carry out some actions. So, large investments were asked from LHP members, as is illustrated by a partner of LHP G: " I think we are a nice example of '10,000-Steps', we have invested €60,000 and, for some time, employed two people full-time on the program, so,… We have definitely showed some engagement." For other partners, these high demands hampered their commitment to the LHP.

"It [engaging in the LHP] remains a difficult story, we had difficulties to contribute financially to the program because their suggestions were not achievable for us, and, a general point of criticism, shall we say, the NAO does suggestions, but they are not involved in the execution, let's say, they take a back seat, and in that sense, it takes a lot of efforts from us… (partner LHP I)."

Secondly, commitment was shown in the dedication towards the program. Some organizations really believed in the success of the program and this contributed eventually to the implementation success. We have heard expressions like: "It is always a voluntary

participation from us which indicates that we are committed, if not, our organization wouldn't engage in the program." (Partner LHP H) and "Of course, we are devoted, otherwise we wouldn't have entered the partnership. Being the local sports administrator, we need to belief." (Partner LHP L).

Finally, we saw the commitment to the LHP through the willingness to collaborate again in the future. In LHPs were partners were pleased with the collaboration, we saw that they were enthusiastic for future cooperation. Some partners told us that the collaboration in the LHP was entered in their long-range plan which means that continuation is guaranteed.

Nevertheless, commitment alone is not sufficient for implementation success. This determinant needed to be accompanied with the determinant S*taffing.* In this determinant, the perception and experiences of the overall quality of all representatives involved in the network was enclosed. While analyzing the interviews, we immediately noticed that the NAO employees had a key role in the partnership. The quality of the staffing was perceived as, the staff is always friendly and enthusiastic, they are hardworking and engaged, they are quick to offer help, they work very professional, and have a lot of knowhow. Further, we can state that enthusiasm and staff quality cannot compensate for the necessity of sufficient manpower to get the work done. A shortness of staff, for both the NAO and partners, was often considered as one of the pitfalls of good collaboration.

Finally, our analyses displayed that commitment and staffing needed to be supplemented with a good coordination or the absence of synergy. Coordination included, among other things, a stimulating meeting culture, mutual goodwill, and living up to appointments. Although coordination was good in ten of the thirteen networks, we observed that even very small coordination issues can cause frictions in the collaboration. Recurring subjects of annoyance

were receiving no reply to emails or answers to questions, canceling appointments, waiting for meeting reports, and other practical misunderstandings.

The synergy in the partnerships was interpreted in this research as the creativity of the participants by means of interactions resulting in new alternatives that otherwise would not have been considered by the individual partners and were subsequently used in other contexts. Synergy is often seen as the creation of something that makes the "whole more than the sum of its parts" which is undeniably perceived as a good feature of network collaboration (Weiss, et al., 2002). For the '10,000-Steps' program, some clear examples of synergy were found, such as "Our engagement in the partnerships has learned us to do things differently, more thematic, involving the target group, doing things step by step, thus, things we were not thinking of ourselves." (Partner LHP M). However, our analyses indicated that the absence of synergy contributed to implementation success.

Communication determinants

The next group of determinants within the management section relates to communication in the partnership. Communication is seen as a critical mechanism for network coordination (Turrini, et al., 2010). Our analyses revealed that out of the three remaining communication determinants, a single variable, namely personal contact, is sufficient to explain effectiveness. *Personal contact* comprised the development of personal relationships between people that were involved in different organizations within the network, mostly between the NAO employees and the different representatives of partner organizations. The NAOs often assign certain project to one specific employee, which means that partners for '10,000-Steps' commonly got in contact with the network through this one person. In this study, we could conclude that representatives of partners, that have a good interpersonal relationship with their contact person in the NAO, generally are very positive about the quality of the staffing. In the interviews, we have heard expressions like "it all depends on the person" (NAO LHP A), "it

all depends on who you need to work with...” (NAO LHP B) or “we have a good relationship with the NAO because we know the people…” (Partner LHP L). The NAO leader of LHP G recognized that personal contact plays a crucial role in network collaboration: “Networks are very labor-intensive, and that requires a broad staff. Communication based solely on emails, newsletters and websites, does not work. Therefore, in networks, personal contacts are essential, and yes, that takes a lot of staff efforts".

The justification that was often heard for the lack of personal contact was that the LHP had insufficient employees to maintain direct contact with all representatives. This was, for example revealed in the interview with an NAO staff member of LHP J: “No, absolutely not, we don’t have the time for a lot of personal contact. You see, we have X cities in our region, but unfortunately municipalities with not many citizens. Our subsidies are calculated upon the number of inhabitant, so, we have only four employees. But whether a municipality has 100 or 10,000 citizens, it takes the same time to convince the local government to join the program.”

The influence of the decision making structure

Although networks are often seen as self-regulated, horizontal forms of coordination, networks can include both vertical and horizontal elements of hierarchy (Kenis & Provan, 2006; O'Toole, 1997). In this study, we did not find a pronounced influence of the decision making structure on implementation success. Furthermore, the effective configuration of the decision making variables was complicated. We could define two types of decision making in the successful networks: LHPs with shared leadership, equal power balance, but lacking a joined conflict resolution and LHPs with an NAO leadership, unequal power balance, but with a joint conflict resolution. This implies that successful decisions can be reached by following different pathways.

It is shown that even powerful network members cannot simply assert their authority, they have to rely on mutual understanding of all partners (Moynihan, 2009). In agreement with this, we found a clear link between an unequal power balance and a joint problem solving mechanism. Thus, although not all partners considered themselves equal, they felt comfortable enough to address conflicts that were detrimental to the collaboration. Two illustrations below of network partners demonstrate that problems are immediately dealt with:

"…If there are real problems, we try to solve them directly. We feel comfortable enough in the LHP to address issues, we know the people well enough..." (Partner LHP L)

"Oh, we have it out straight away, down at the table, certainly not by email of telephone, right down together. That's the case for everything, we don't let it simmer." (Partner LHP G)

In the LHPs were the power balance was equal and the leadership shared, the link with conflict handling was not that clear. Interviews revealed that these LHPs needed more time to reach a consensus. Consequently, the decision making was adjusted to the situation. "When an urgent issue needed to be solved immediately, it was not possible to consult with each other, but not urgent matters were decided in consultation." (Partner LHP B)

Further minimizations

Table 2 gives an overview of the further minimizations of the QCA analyses. When combining the environmental and the structural determinants into the antecedents category, effectiveness was reached in LHPs with partners that had exposure motives and in LHPs with written agreements, but without a large city or with partners with political motives. The influence of the environmental determinants: positive merger effects, the low population density, and small geographical working area were undone by the power of the structural determinants.

The global analysis of the management section -which encompasses the attributes of partnership, communication and decision making-, indicated that effective LHPs had high levels of commitment supplemented with personal contact or high quality staff without synergy. In this minimization, all decision making determinants were absorbed. That does not mean that decision making is not important for network functioning, but rather that these determinants had not sufficient power to distinguish between high and less successful collaborations. This also implies that different decision making strategies can lead to success, as well as the same strategies may be less effective for other networks.

The smallest configuration for a high effective network was calculated by combining the antecedents and management variables into the final csQCA analysis. The most effective networks did not have a large city in their area, had a high quality staff, had high commitment among the network partners of which some had a political and an exposure motive or had a political motive, written contracts, and personal contact between the representatives. In this last minimization only the absence of synergy disappeared in the final formula. When considering all possible determinants for effectiveness, there remain four antecedent determinants and three managerial determinants.

Discussion

In the literature, network effectiveness is often defined as the attainment of positive network level outcomes that could not normally be achieved by individual organizational participants acting independently (Provan & Kenis, 2008). In this research, the Flemish government aspired to spread the '10,000-Steps' program. Therefore, 13 NAOs were mandated to form project networks with different partner organizations within their geographical region. Nor the Flemish government, nor any other single organization could achieve this goal on its own, but together they were successful. However, regional differences in success of implementation

were found between the 13 networks. Rutten (2012) suggested that explanations for regional differences in program effectiveness might be found in differing intermediate policy processes, while Chen and Graddy (2010) put forward that the nature of the partnership is also likely to influence its ultimate effectiveness.

The methods that we have used in this study, the QCA-analyses, adhere the configuration theory. By use of different configurations, we reduced the complexity of network collaboration in order to detect logic patterns that add to the understanding of how network effectiveness can be realized (Lamothe & Dufour, 2007). Initially, we searched for the most successful configurations of variables of the environment, structure, partnership, communication and decision making separately. Secondly, we clustered the remaining determinants according to their origin: antecedent or management. Since all determinants act as a whole, interrelate and complement each other, eventually, we searched for the most successful configuration by combining all determinants. Our final configuration contains seven unique determinants of which four refer to antecedents of the network (*Exposure motive, Political motive, Metropolitan and Governance*), and three of them are managerial variables (*Commitment, Staffing and Personal Contact*).

Results show that two types of partner motives contribute directly to the level of implementation success. We found that the presence of *Political* and *Exposure motives* among the project partners were related with the most successful networks. The connection between network effectiveness and the motivations to form a partnership have already been described in the literature. Eglene, Dawes, and Schneider (2007) and Head (2008) concluded that public sector collaborative networks benefitted from political support. In agreement, Shortell (2002) noticed that successful health community partnerships intentionally sought for political support. The *Exposure motive* refers indirectly to image building of the partner organization. The organization's motive to improve its own reputation, image, or prestige has already been

widely recognized in the literature (e.g., K. Babiak, 2007; Chen & Graddy, 2010; Dimaggio & Powell, 1983; Hudson, 2004).

Further, we could conclude that the absence of a large city was related to the successful implementation of the program. This points implicitly towards the homogeneity or diversity of the partner organizations. It is shown that diversity can make collaboration difficult (Provan & Lemaire, 2012). We can only put forward that the presence of a metropolitan adds complexity to the network, which makes network management more challenging.

Next, the positive influence of formal partnership agreements was revealed in our study. This finding is similar to those of Parmigiani and Rivera-Santos (2011) who concluded that relationships run more smoothly when standardized contracts are in place. Written agreements clearly outline roles and responsibilities and give insights in the commitment of all partners whereby participants are less likely to adopt a short-term view or act opportunistically (Frisby, Thibault, & Kikulis, 2004; Hudson, 2004). Further, rules bring a set of minimal agreements which fosters interaction, simplifies collaboration and stimulates the development of policy processes (Jackson & Stainsby, 2000; Klijn, Edelenbos, & Steijn, 2010). Against this, downsides of contracting can be found in the literature, especially in relation to the flexibility, innovation capacity and the group dynamics of networks (Head, 2008; Provan, et al., 2009).

Commitment is the first managerial key determinant that showed a positive relation with the most effective LHPs. Also this corresponds with the network literature. Already in 1994, Morgan and Hunt (1994) have recognized that commitment is essential for relationship satisfaction and network continuation. M. P. Mandell and Keast (2008) believed that commitment is a basic pillar in network cooperation. When it comes to the next two variables, *Staffing* and *Personal contact,* we discuss these together since they were strongly intertwined

in our research. In the literature, the relevance of the quality of the representatives in the network and the benefits of personal contact have been extensively discussed. Our study showed that the quality of staff was essential for good network collaboration, and hereby, *Personal contact* had not only a positive influence on success when it was present, but it also had a clear negative influence when it was absent. Representatives show a preference for interacting not with complete strangers but, rather, with acquaintances or even personal friends (Kilduff, Tsai, & Hanke, 2006). Next to the preferences of people involved, Hudson (2004) found that, when dealing with network partners, individuals gradually gain better information about, for example, their partners' competencies, capabilities, intentions, needs, limitations and personal qualities, which had a positive effect on the attitude towards each other. Another positive feature is that informal interpersonal relationships facilitate the active exchange of information and the development of trust, which fosters interorganizational cooperation (Gulati & Gargiulo, 1999). Regular meetings to discuss issues and continue valuable face-to-face contacts strengthen those relationships (Caudle, 2007). Also Sherer (2003, p. 339) recognized that "personal relations are important", moreover, she has found that honesty and reliability were more important than the capabilities of the people involved in the network. Head (2008) stated that enhancing the relationship skills and social capital of participants increases the potential for success.

In summary, we can agree with Agranoff (2007) who concluded that the staff has a crucial role in the network and that they not only bring their resource-based power (e. g., knowledge, expertise) to the network, but also their willingness to make the network succeed. In this way, all three management variables are intertwined. Commitment entails the sense of emotional or intellectual connection to certain aspirations, which may include a person's personal relationship with another person, group, or organization (Eisenberger, Huntington, Hutchison, & Sowa, 1986). Personal contact stimulates interpersonal relationships between

representatives, and the better these contacts, the more positive they perceived each other's qualities and, again, the larger their commitment is to the network (Hudson, 2004).

Not only the determinants of final minimization contain essential information about network effectiveness, also the different intermediate configurations itself are important. The antecedent configuration shows that structural choices can overcome environmental issues, since spaciousness and population density of the network area lose their relevance once the structural features were added. This conclusion can have important practical implications. The environmental features that are -at first sight- out of the control of network managers (i.e. population density or the presence of a metropolitan), can be overcome by consider the right network composition and type during future network formations.

In the management minimization, all decision making determinants were absorbed. This does not mean that the decision making system is not important for network effectiveness. On the contrary, it reveals that there is no single decision making system that can guarantee network effectiveness. Also the coordination determinant was omitted in this phase, which shows that coordination issues do not have to be a stumbling block for effectiveness. The remaining managerial variables that were selected relate to the people cooperating in the networks, e.g. their commitment towards the network, personal relations among network members, and the perceived staff quality. M. P. Mandell and Keast (2008) also recognized that human interactions are a core component since a network is centered on developing relationships and processes to facilitate interaction, which in the end establish whether a program will or will not be effective.

When combining the antecedents and the management minimization into the final minimization, only the variable synergy was not included. As previously said, we found the absence of synergy to be related with network effectiveness. This may be a somewhat odd

result, however, the literature shows that synergy only occurs under certain circumstances, for example when there are a lot of interactions among the network members (Agranoff & McGuire, 2001) or only a relative small number of network partners (Roberts, 2000). In our networks, interactions mainly go through the NAO and the number of partners is rather large. Further, the absence of synergy could a result of the new collaboration that was set up for '10,000-Steps'. Since this was the first program that related to physical activity, the traditional LHP partners needed to be supplemented with completely new partners, such as public health services.

Conclusions and limitations

This study revealed a unique configuration of seven determinants: Exposure motive, Political motive, Metropolitan, Governance, Commitment, Staffing and Personal Contact. Thus, the final minimization encompasses environmental, structural and managerial determinants. Kenis and Provan (2009) also acknowledged the importance of exogenous determinants, next to endogenous, in the light of network assessments. We can conclude that the combined action of these determinants eventually lead to network effectiveness. Therefore, it is crucial that the management of a network is tailored to the network structure, which in its turn needs to be a good fit with the environment.

The contribution of this article is threefold. Firstly, we have brought empirical evidence of a substantial cluster of mature networks towards a domain that has been mainly theoretical for a long time. Our research set-up was quite unique. We had on the one hand, 13 different networks with the same goal, under the same regulations, but with the autonomy of choosing their own approaches. On the other hand, we had two large-scale quantitative data sets measuring the awareness of the program in the whole region and other important descriptive information that allowed us to make a strong outcome variable. Together with the 52

interviews providing qualitative data, our study provides an in-depth insight into the functioning of the different networks. Secondly, we contributed to the demands of two theoretical management streams. We met the network management literature's demand to study network governance as a whole (Provan, et al., 2007) and to the configuration theory that urge for a more holistic perspective in organization studies (Zaefarian, Henneberg, & Naudé, 2013). Finally, our study results can be easily translated into practical guidelines for practitioners in the field.

The relative small sample of 13 networks and the unique program and place characteristics limit the ability to generalize the results of this study. Furthermore, our study searched for configurations of determinants of effectiveness within a very specific type of networks, we have studied mandated networks with a NAO structure. It is most likely that these performance criteria will not apply to other network governance types, as already indicated by Kenis and Provan (2009). As we have said previously, the overall implementation of the program was successful. Perhaps, this influenced the composition of our configurations and the inclusion of certain variables which suggests that it might be interesting to include clearly failed networks in our study to compare with. Further research is necessary to value the influence of the network type and the specific environmental factors on our configurations of network effectiveness.

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Figure 1: Theoretical Partnership model for sport and physical activity community-based partnerships of Parent and Harvey (2009).

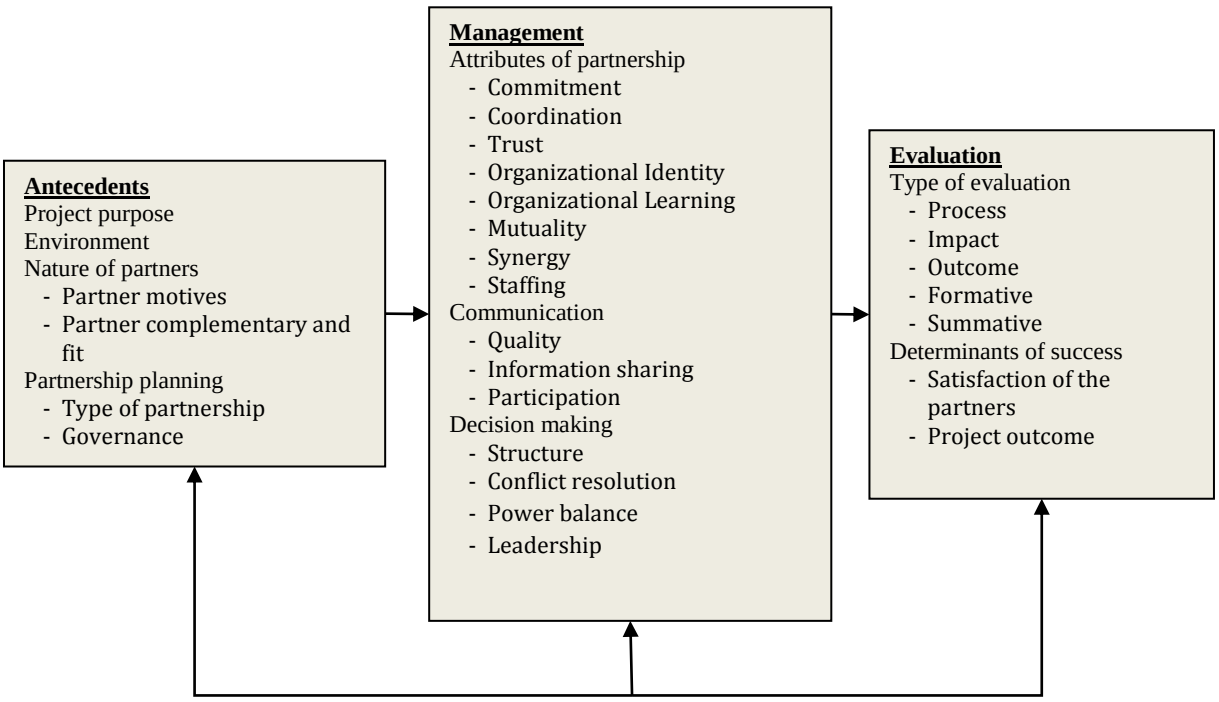

Table 1: Overview of the Boolean minimizations for the different groups of variables of the model of Parent and Harvey (2009).

Type of variables	N°	Boolean minimizations	Coverage	Consistency
Environmental	5	~metropolitan • pos. merger • ~spaciousness + ~metropolitan • pos. merger • ~population density	0.43	1.00
Structural	6	exposure + political • governance	1.00	1.00
Antecedents	7	exposure + governance • ~metropolitan + political • governance	1.00	1.00
Attributes of partnership	6	commitment • ~synergy • staffing + commitment • coordination • staffing	1.00	1.00
Communication	3	personal contact	0.86	0.86
Decision making	4	~conflict resolution • power balance• leadership + conflict resolution • ~power balance • ~leadership	0.43	1.00
Management	8	commitment • ~synergy • staffing + commitment • personal contact	1.00	1.00
OVERALL	9	staffing • commitment • ~metropolitan • political • exposure + staffing • commitment • ~metropolitan • political• personal contact • governance	1.00	1.00