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Modes of network governance revisited: Assessing their prevalence, promises, and limitations in the literature

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Abstract

The systematic literature review takes stock of the empirical literature on the governance of organizational networks. The analysis is based on empirical papers citing Provan and Kenis (2008) as the seminal article on the governance of networks. We synthesize key findings on the modes of network governance, contingency factors, and network-level tensions. The review provides insights into how the contingency theory of network governance has developed into an established and recognized research agenda in the last 15 years. We conclude that the governance of organizational networks as a vocabulary has been adopted in the management and organization sciences literature to explain organizational networks' development, functioning, and effectiveness. However, further theoretical development and testing are warranted to inform the practice of network governance, particularly when, how, and why to use institutions and structures of authority and collaboration to allocate resources and coordinate and control joint action of groups of organizations.

Evidence for practice

- Practitioners must be aware of the increasing prevalence of situations where value must be created in concert with other organizations. The organizational network's governance mode is central to the success of value creation.
- The main takeaway for practitioners is that there is no best way to organize an organizational network. Still, we know that network governance modes' adoption and design choices are contingent on the problem/task structure and environmental, structural, and relational conditions.
- Practitioners must become mindful of and competent in reading these conditions when developing appropriate governance for organizational networks.

INTRODUCTION

This literature review focuses on what we know about the different modes or forms of governance of organizational networks and their effects. It, therefore, looks at network governance from an organization and management perspective. Building on Provan and Kenis (2008), Gulati et al. (2012), and Puranam (2018), an organizational network is defined as "a (1) multiagent system of three or more legally autonomous organizations that are (2) not bound by authority based on employment relationships but characterized by (3) a distinct identity derived from a particular boundary and membership arrangement and (4) network-level goals toward (5) which the constituent organizations' efforts are expected to contribute" (van den Oord, 2023, p. 27). Organizational networks have become increasingly prevalent in the public and nonprofit domains (Smith, 2020; van der Weert et al., 2022) but also in various industries and business domains (Ciabuschi et al., 2020; George et al., 2023; Provan et al., 2007; Reeves & Pudin, 2022) because they present an alternative strategy to organizations to deal with

environmental uncertainty and attain a purpose that a single organization cannot easily achieve independently (Nowell & Kenis, 2019; Popp et al., 2014; Provan & Lemaire, 2012).

Each organizational network exhibits a division of labor, meaning its network-level goal can be separated into tasks and allocated among several organizations. Rather than multiple organizations working together independently, serendipitously, or competing, organizations joining a network engage in joint efforts to achieve a set of tasks (Kenis & Raab, 2020). Any organizational network must then find a way of organizing without relying on formal authority to ensure that organizations collaborate, that their activities are coordinated for a given division of labor, that resources are allocated, and that activities are directed toward achieving the network goals (Provan & Kenis, 2008). Only by transforming a group of individual organizations into a goal-directed system of coordinative action can authority be arranged and collaboration be structured to maximize the value of the network for collective and individual outcomes related to the network purpose (Gulati et al., 2012; Provan et al., 2007; Provan & Kenis, 2008).

Different levels of analysis and perspectives are applied to study organizational networks (Berthod & Segato, 2019; Carboni et al., 2019; Lemaire et al., 2019; Nowell et al., 2019). Provan and Kenis (2008) suggested combining the network analytical and governance perspectives to consider the network as the unit of analysis and treat it as a differentiated organizational form. By combining these perspectives, Provan and Kenis (2008) developed a contingency theory of network governance to propose which form of network governance fits best in which situation and context. The basic assumption is that the better the fit between the form of network governance and their contingency factors, the more effective the network is. Network governance concerns the "use of institutions and structures of authority and collaboration to allocate resources and to coordinate and control joint action across the network" (Provan & Kenis, 2008, p. 231). It "entails the structure and processes that enable organizations to direct, coordinate and allocate resources for the network and to account for its activities" (Vangen et al., 2015, p. 1244).

Provan and Kenis (2008) suggest three ideal types of network governance modes: (1) a shared-participant (SP) mode, where network members jointly govern the network (non-brokered/internal); (2) a lead organization mode, in which one network member governs the network (brokered/internal); and (3) a network administrative organization (NAO) mode, where a separate organization is established to govern the network (brokered/external).

Provan and Kenis' network governance modes, first published in a paper in the Journal of Public Administration Research and Theory (JPART), have been widely adopted and cited in the public management and organization sciences literature. The paper has become one of the most cited articles published in a public administration journal in recent years. However, it has also received a strong reception outside this field.[1] The paper by Provan and Kenis (2008) is part of the literature on organizational networks and governance, more broadly developed since the 1980s in organization and (public) management, economics, political science, and sociology. In (public) management, it directly builds on the seminal paper by Provan and Milward (1995) on the effectiveness of networks and has strong connections to questions of network management (cf. Milward & Provan, 2006; Provan & Lemaire, 2012).

Furthermore, it further develops the framework suggested by Milward and Provan (2006), which guides (network) managers on types, purposes, and essential tasks such as accountability, legitimacy, conflict, design, and commitment. Indirectly, it strengthens Agranoff and McGuire's framework, suggesting that decisions on network governance are part of the activation and mobilization tasks and have substantial implications for the framing and synthesizing management tasks for networks (McGuire, 2002). The governance modes of Provan and Kenis (2008) also partake in the broader discussion in public management on how to govern collaborative (organizational) arrangements (Ansell & Gash, 2008). Last but not least, the paper builds on broader questions of the governance of social and economic systems as they have been discussed since the 1970s (Ostrom, 1990; Powell, 1990, 2011; Williamson, 1975), and more recently, are reinvigorated by network scholars that study social-ecological systems to find solutions for grand societal challenges (Bodin, 2017; Vantaggiato & Lubell, 2022). While building on the discussion on governance through markets, hierarchies, and networks, the paper by Provan and Kenis (2008) represents an important further step and a change of perspective, that is, the idea that there are different types of and ways to govern networks that might lead to different outcomes depending on a set of contingency factors.

The broad reception of the network governance framework by Provan and Kenis indicates that organizations jointly produce collective outcomes through network forms of organization (Powell, 2011) rather than markets and hierarchies in more areas of the economy and society. The explanation of collective outputs and outcomes has traditionally been a focus and a strength of public administration (PA) research, which, therefore, becomes increasingly relevant outside the core PA domain. The broad reception of the governance modes enables us to take on a prospector perspective in analyzing network governance across many scientific fields, especially concerning the "blending and merging of literature across fields" (Breslin & Gatrell, 2023, p. 145) and to investigate how network governance functions, how it varies, and what the outcomes are in different settings. This investigation should also be fruitful input for the theory development in Public Administration. For example,

we still lack systematic empirical evidence on which mode is effective under what specific conditions and for what purposes different governance modes achieve integration of effort by a group of organizations working together to accomplish a collective set of tasks. Since governments increasingly use organizational networks as an intervention (cf. Valente, 2012) to cope with complex societal and environmental issues (Gray & Purdy, 2018), it is imperative to develop further and continuously update our knowledge on the governance of these networks. In this context, it is indicative that organizational networks have found their way as the overarching goal 17: "partnership for the goals" into the UN Sustainability Goals (Kapucu & Beaudet, 2020).

We, therefore, propose it is time to take stock of the empirical evidence about how organizational networks govern themselves and further develop Provan and Kenis' network theorem. This article aims to revisit Provan and Kenis' contingency theory of network governance by assessing the accumulated knowledge of the governance of organizational networks as reported in empirical research from 2008 to 2022. More explicitly, we set out to systematically review what network governance modes have been examined in the empirical literature citing Provan and Kenis (2008) because we are interested in what institutions and structures of authority and collaboration organizational networks use to arrange three or more organizations given contingent conditions, manage network-level tensions, and adapt network governance modes over time. Given the prominence of the article, which at the time of writing has been cited 1837 times according to Web of Science and 5166 in Google Scholar, and the establishment of the three modes of network governance, we deem it a valid strategy to take this paper as the seed article for our literature search. The following questions guided our review of the empirical literature:

1. Which network governance modes suggested by Provan and Kenis (2008) have been identified in empirical research?
2. Which other types of network governance modes are described in the empirical research?
3. What factors explain the differences in governance modes?
4. What are the consequences of network governance modes?

We structure the article into three sections. In the first section, we describe the scope and method of the systematic literature review. In the next section, we take stock of the contingency theory of network governance. This section contains three main parts, each centering on a core construct of the theorem. In the third section, we present lessons learned from reviewing the empirical literature on the network governance modes and their evolution, contingency factors, systems fit, network-level tensions, and network effectiveness. We close this last section by outlining implications for practice and a research agenda presenting what future direction research on the governance of organizational networks would be fruitful. We propose to take this review as the starting point to develop an open science database on network governance literature, which forms the basis to continuously update our knowledge on network governance and update the present review every few years. We would also like to open this up to other researchers who want to contribute and thus collectively systematize the existing knowledge and improve the knowledge aggregation process.

SCOPE AND METHOD OF REVIEW

We conducted a systematic literature review on the empirical literature citing the journal article: Provan and Kenis (2008)[2]. We opted for this scope because we are primarily interested in whether and how network governance introduced by Provan and Kenis (2008) has been used and developed since its online publication in 2007. We extracted, mapped, and assessed 1357 journal articles written in English that cited the seed article reported in the ISI Web of Knowledge database (Clarivate, 2019, covering 15 years [2008–2022]). We refined the extraction to the Web of Science database's Social Sciences Citation Index (SSCI). We applied three inclusion/exclusion criteria to determine eligibility based on the core constructs of Provan and Kenis's contingency theory. A formal definition of Provan and Kenis' theorem is shown below in Table 2.

Given our scope and interest, we excluded articles that did not consider the network as the unit of analysis (Provan et al., 2007; Raab et al., 2013), were primarily conceptual or descriptive, or mainly contributed by methodological considerations and measurements. Simultaneously, we checked whether articles focused on "network governance" as a topic in the title and abstract using Provan and Kenis's definition of network governance. We have summarized our approach in Table 1. Ultimately, the scope and method of review led to a final selection of 184 articles that we classified on the seven core constructs of the network-level structural contingency theory of network governance by Provan and Kenis as defined in Table 2.

RESULTS

In this section, we take stock of the contingency theory of network governance. This section consists of three main parts. In the first part, we identify which network governance modes we have found in the literature. In the second part, we explain the differences in these network governance modes by focusing on Provan and Kenis's original contingency factors. The third part centers on the consequences of network governance modes. Based on these parts, we present what lessons we learned from reviewing the empirical literature on the network governance modes and their evolution, contingency factors, network-level

TABLE 1 PRISMA statement.

Phases	Steps
Identification[a]	1357 records were identified through database searching. No additional records were identified through sources. No duplicates were found.
Screening	1357 records were screened on title and abstract. 1057 records were excluded.
Eligibility	300 records were assessed on eligibility. 198 records were cross-referenced with 120 records in the 2018 version of this paper. 116 records were additionally excluded.
Included	184 records were included in the qualitative synthesis

Note: Web of Science Electronic Database was latest accessed on June 21, 2023. We conducted a default search on the article of Provan and Kenis (2008). The database was refined to the Web of Science database's Social Sciences Citation Index (SSCI), article as document type, and English as language. Based on this setting, we collected all citations from 2008 to 2022—3 articles listed from 2023 (see Table 3).

[a]In an earlier version of this article presented at PMRC 2015, we also included the Google Scholar Database. However, we decided to opt solely for the Web of Science Electronic Database, considered this database to be more accurate and reproducible and used by others as one of the standards.

tensions, systems fit, and network effectiveness. However, before we elaborate on the results, we start by briefly presenting the descriptive findings of the review.

Descriptive results

Table 3 shows the number of included articles cited per year by Provan and Kenis (2008). The number of articles examining the governance of organizational networks has increased over time compared to the latest systematic literature review of network research by Provan et al. (2007). This finding is not surprising given the increasing number of citations by Provan and Kenis (2008) since its publication and the recent attention the topic has received with the symposium on purpose-oriented networks published in the Journal of Perspectives on Public Management and Governance (see the special issue in PPMG; Nowell & Kenis, 2019) Online supplement E (Tables E1 and E2).

Most of the articles included in the review were published in public administration journals (online supplement D), with the top 5 consisting of JPART ($n = 19$), Public Management Review (PMR) ($n = 18$), The International Public Management Journal (IPMJ) ($n = 8$), Public Administration (PA) ($n = 7$), and Public Administration Review (PAR) ($n = 7$). Even though the article of Provan and Kenis (2008) was published in JPART, we observe that scholars devote substantial attention to the governance of networks in journals of management and organization sciences, health-related journals, and other journals (see the online supplement D). Therefore, it is fair to state that the governance of organizational networks has developed into an established and recognized research agenda in PA over the last 15 years. For an overview of network categories and network cases please visit Online Supplement E. However, this research agenda is geographically biased (cf. Nohrstedt et al., 2018). Online supplement F (Tables F1-3) shows that studies are underrepresented in Africa, Asia, the Caribbean, Oceania, and South America. Specifically, we found that the top 10 network studies reporting a single country were biased toward the United States (and Canada), Europe (Belgium, the Netherlands, Italy, Switzerland, and Germany), the UK, Australia, and Brazil (See Table F2). Promising in this regard is the presence of Brazil in the top 10 and China, Israel, Kenya, Singapore, and Columbia in the top 20. Focusing on the top 10, Europe (including the UK and Switzerland, 59 articles) dominates North America (the United States and Canada, 42 articles). Another finding reported is that 42 studies examined networks in two or more countries, with nine studies having an intra-regional focus and 14 studies even portraying a global scope (See Table F3).

Regarding the sector,[3] we find similar findings previously reported by Provan et al. (2007). The online supplement G (Tables G1 and G2) shows articles with a single-sector classification ($n = 17$). The sector of human, health, and social work activities is the most prominent (68 articles, 40%), followed by the sector of PA, defense, and social security (33 articles, 20%), the tied sectors of manufacturing (12 articles, 7%) and professional, scientific and technical activities (11 articles, 7%), agriculture, forestry, and fishing, eight articles (9 articles, 5%). We also found 16 studies examining networks in multiple sectors. The online supplement G portrays eight combinations of various sectors.

Comparable to Provan et al. (2007), case study research is the most common type of network study conducted. With 77 studies adhering to a single case study research design (42%) and 11 and 69 to a comparative or multiple case study research design (44%). Also, we found 27 studies with a survey research design (15%). See online supplement H (Table H1 G. Unlike Provan et al. (2007), the selection of empirical research was unevenly distributed with cross-sectional data in favor of studies with longitudinal data (142 articles, 77% vs. 42 articles, 23%, see Table H2). Online supplement H shows that most empirical studies employed qualitative analysis to examine networks. One hundred eighteen studies used a qualitative analysis approach such as thematic (i.e., 632), content (i.e., 457), narrative inquiry (i.e., 26), framework analysis (i.e., 731), pattern analysis (i.e., 432) or matching (i.e., 528), comparative analysis (i.e., 319), (network) ethnography (i.e., 636), process tracing (i.e., 240), research-oriented action research (RO-AR) (i.e., 398), or another form of action research (i.e., 206).[4] We also observed that 18 studies employed Qualitative Comparative Analysis (QCA), of which seven studies conducted a crisp-set QCA (i.e., 39) and 11 studies used a fuzzy-set QCA (i.e., 441) (Tables H3).

Compared to these qualitative data analysis techniques, only 34 studies consorted to quantitative data analysis, including various types of regression analyses

TABLE 2 Formal definition of Provan and Kenis' network-level contingency theory of network governance.

Core constructs	Definition
1. Organizational network	Groups of three or more legally autonomous organizations work together to achieve not only their own goals but also a collective goal (Provan & Kenis, 2008, p. 231).
2. Network effectiveness	The attainment of positive network-level outcomes that could not normally be achieved by individual, organizational participants acting independently (Provan & Kenis, 2008, p. 230).
3. Network governance	The use of institutions and structures of authority and collaboration to allocate resources and coordinate and control joint action across the network as a whole (Provan & Kenis, 2008, p. 231).
4. Two key factors and three ideal types of network governance modes	The network governance mode is determined by two key factors: brokered/non-brokered governance and participant (or internal)/external governance. Combining these factors leads to three ideal types of modes. 1. *Shared participant mode* is a non-brokered form of network governance characterized by a network without an administrative entity in which all or majority of network members participate in the governance of the network. 2. *Lead-organization mode* is a brokered form of network governance characterized by a network member in the role of a lead organization, which acts as an administrative entity in the governance of the network and participates as a service provider in the network. 3. *Network administrative organization mode* is a brokered form of network governance characterized by a distinct administrative entity that is specifically set up to govern the network.
5. Four contingency factors	1. *Trust*: the level of trust density that occurs across the network as a whole; that is, the distribution of trust and whether it is reciprocated among network members (Provan & Kenis, 2008, p. 238). 2. *Network size*: the number of network participants: 3. *Goal consensus*: the degree of consensus on broad network-level goals, both regarding goal content and process (Provan & Kenis, 2008, p. 239). 4. *Need for network-level competencies*: the needs that arise of the nature of the task being performed by network members and the external demands and needs faced by the network (Provan & Kenis, 2008, p. 240).
6. Systems fit	Consistency between four contingency factors and a particular mode of governance (both in terms of the number of consistent factors and the extent to which these factors are consistent with characteristics of the governance form) (Provan & Kenis, 2008, p. 241; see also Drazin & Van de Ven, 1985).
7. Three network tensions	1. Efficiency versus inclusiveness 2. Internal versus external legitimacy 3. Flexibility versus stability

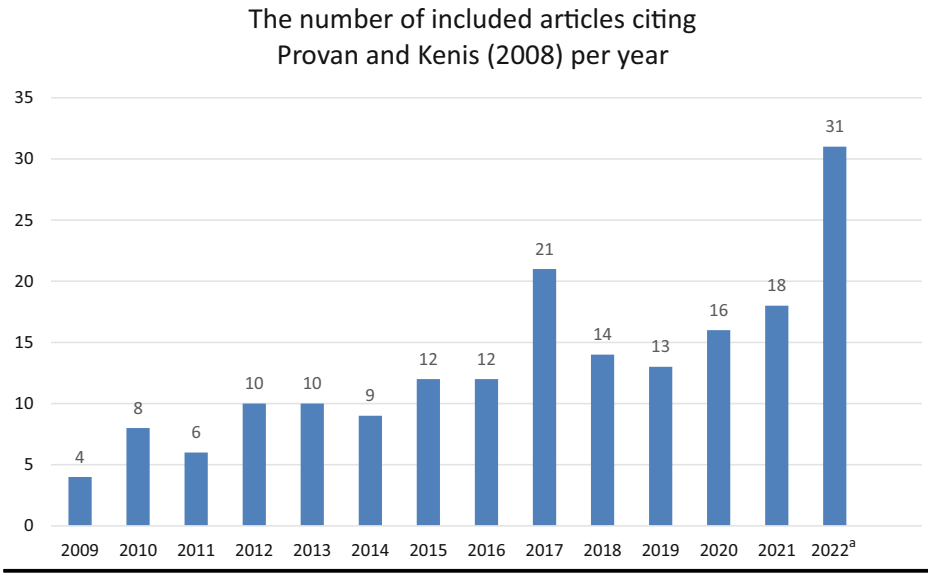
(i.e., 446), co-variance analyses (i.e., ANOVA, see 527), structural equation models (i.e., 594), and Bayesian statistics for regression modeling (i.e., 429). Often, these analyses are complemented with descriptive, confirmatory factor analysis and bi-variate or correlation analyses. Although network research is tied to Social Network Analysis (SNA), the selection of empirical research only included 14 studies using SNA. This result is surprising, given that network structure has received increasing attention in public administration (Hu et al., 2016) and strategic management and organization studies (Shipilov & Gawer, 2020; Tasselli et al., 2015).

Part 1: Taking stock of network governance modes

In this part, we describe which network governance modes suggested by Provan and Kenis (2008) have been identified and which other types of network governance modes have been described in the literature.

We classified the 184 network studies into articles with a single mode of governance and articles with multiple modes of governance in the online supplement I (Tables I1 and I2). This highlights three key findings. The first finding is that the network governance modes suggested by Provan and Kenis (2008) are adopted in the empirical body of network literature. Furthermore, it shows that of the original modes, 12 articles exhibited a SP network governance mode, 35 a lead-organization (LO) network governance mode, and 50 a NAO. The second finding is that the empirical literature shows hybrid and other network governance modes. The former involves a network governance mode that combines different elements of the original modes (i.e., 521; 435; 836; 822), respectively, the SP, LO, and NAO. At the same time, the latter denotes other modes that are different or distinct from the original modes (i.e., 808; 824). Third, we still

TABLE 3 The number of included articles citing Provan and Kenis (2008) per year.



[a]Three articles from the year 2023 are added to 2022.

find network studies that do not (or only implicitly) mention the network governance mode, making it difficult to describe and explain network governance (cf. Provan et al., 2007).

From the classifications, we can derive the beginnings of several patterns of network governance modes. First, we find combinations of the original modes grounding Provan and Kenis's (2008, p. 233) thesis that "networks vary concerning their structural patterns of relations." Specifically, the review yields 11 studies that exhibit all three original modes, 14 combinations of non-brokered and brokered network governance modes, and one study that describes the development of a network governance mode. Also, in articles showcasing multiple network governance modes, we find hybrid combinations and other modes of network governance.

Although the main aim of the systematic literature review centered on the original modes, examining articles with other network governance modes revealed several interesting findings. For instance, we discovered the label of a new governance mode, the so-called "network constitutional organization" (3). Kilfoyle and Richardson (2015)—analyzing the Universal Postal Union (UPU) governance structures and the use of management accounting and control systems by network-level administrators—identified two governance layers with four organizational bodies in the UPU. Building on the earlier work of Provan (1983), they defined "the bodies through which members set policy (the UPU Congress and its standing committees) as the "network constitutional organization" (Kilfoyle & Richardson, 2015, p. 552)," while the NAO implements these policies within the network. Typically, we found descriptions similar to Wiktorowicz et al.'s (2010) corporate structure, mutual adjustment, or an alliance governance model in other network governance modes. While such depictions often resemble the ideal types of Provan and Kenis (2008), other modes of governance differed more in terms of the level of analysis and labels (i.e., 5; 266) termed with concepts like governance roles (i.e., 661; 872), leadership (i.e., 895), the managerial activities and strategies used to coordinate the joint efforts of network members (770; 545; 653; 666; 644).

Part 2: Variations in network governance modes

In this part, we examine what explains the differences in the presence of a particular network governance mode by assessing the contingency factors of network trust, size in terms of the number of network participants, goal consensus, and network-level competencies. We sorted the 184 network studies into articles exhibiting single or multiple modes. Accordingly, we classified the original and hybrid modes of network governance, mentioning one or more contingency factors. In doing so, we can synthesize existing knowledge of each mode into cohesive summaries and identify research gaps.

Table 4 summarizes the findings of 148 network studies with a single network governance mode, with 97 network studies exhibiting an original mode, eight studies a hybrid mode, 37 studies another mode, and six studies not mentioning the network governance mode. Table 5 shows the results of 36 network studies displaying combinations of multiple original, hybrid, or other network governance modes. This table shows 25 combinations of original modes of governance, eight combinations of hybrid modes, and two combinations of original and other modes.

Based on Tables 4 and 5, we can assert several main findings. Although we could identify the network governance modes in most studies, explaining their variations

TABLE 4 Classification of network governance modes and contingency factors in articles with single modes.

Articles with a single-mode	Modes	*N* (articles)	Trust	Size	Goal	Network-level competencies	Fit	Articles ID
Original modes	SP	12	1	5	3	4	2	464, 724, 663, 456, 249, 472, 336, 319, 441, 17, 847, 897
	LO	35	12	8	5	10	-	320, 743, 535, 662, 152, 406, 316, 597, 341, 210, 200, 503, 542, 604, 47, 654, 624, 458, 661, 196, 565, 658, 632, 602, 809, 814, 826, 841, 842, 852, 863, 872, 887, 890, 901
	NAO	50	10	6	11	11	2	772, 692, 253, 528, 584, 148, 404, 727, 195, 296, 24, 621, 429, 158, 446, 39, 48, 333, 123, 650, 79, 455, 655, 457, 684, 295, 26, 671, 262, 233, 206, 445, 619, 450, 652, 410, 337, 636, 91, 804, 810, 813, 844, 849, 850, 856, 883, 886, 898, 899
Hybrid modes	HYBRID: LEAD NETWORK	1	-	-	-	-	-	876
	HYBRID: Multiple LOs	1	-	-	-	-	-	825
	HYBRID: SP/LO	4	-	2	-	-	-	244, 885, 889, 891
	HYBRID: SP/LO, but not formal	1	-	-	-	-	-	836
	HYBRID: SP/LO/ NAO	1	-	-	-	-	-	843
Other		37	6	10	4	6	2	557, 219, 541, 5, 399, 33, 3, 770, 666, 644, 223, 673, 545, 240, 266, 731, 729, 548, 656, 300, 657, 805, 808, 812, 819, 824, 828, 851, 853, 854, 855, 858, 861, 879, 884, 894, 895
Not mentioned		6	1	2	2	-	-	527, 335, 653, 426, 448, 873
Total		148	30	31	26	31	6	

with the original contingency factors remains challenging because the evidence is small and primarily anecdotal. For instance, we classified only six studies considering all four contingency factors (17; 123; 262; 266; 300; 658) and six studies with a combination of three of them (378; 445; 548; 661; 886; 896). Based on these studies, we find partial evidence for the trust density factor of the shared network governance contingency proposition [P_2] (17). In addition, we find partial confirmation for the trust and size factor (661) and partial rejection of trust and goal-consensus factors of the lead organization governance contingency proposition [P_3] (658). Vasavada (2013) attributes this divergence to the resource dependence dynamics in the developing country setting. For the NAO governance contingency proposition [P_4], we find explicit (123; 886), implicit (445), and mixed (262) evidence that it holds. Finally, we found three studies examining all the original contingency factors but for other network governance modes (266; 300; 548). In summary, few network studies examined trust distribution, network size, goal consensus, and network-level competencies related to network governance modes. When scholars did, they often studied them in isolation or not in relationship to the network governance mode. Consequently, a gap still appears in the literature in understanding what explains the differences in network governance modes. Despite these results, we are observing that the more recent literature examines network governance modes as the phenomenon of interest and outcome (i.e., 807; 825; 837; 838; 846; 849; 850; 858; 866; 876; 896; 901).

Table 4 shows that in studies demonstrating a single "original" mode of network governance, the explanatory factors of trust, size, goal consensus, and the need for network-level competencies are less addressed in non-brokered (SP) than in brokered modes of network governance (LO-NAO). This pattern is striking to us since the configurational proposition of the SP mode—trust is widely shared, goal consensus is high, and the need for network-level competencies is low among relatively few network participants (Provan & Kenis, 2008)—is perhaps closest to the original conception of what an organizational network entails (Powell, 2011).

In the same table, we find that trust is examined more for brokered modes of network governance. One explanation for this may be the characteristic configurations in which a network member (LO) or a separate organization

TABLE 5 Classification of network governance modes and contingency factors in articles with multiple modes.

Articles with multiple modes	Modes	*N* (articles)	Trust	Size	Goal	Network-level competencies	Fit	Articles ID
Combinations of original modes	SP and LO	3	-	-	1	-	-	259, 558, 174
	SP and NAO	4	1	1	1	-		516, 807, 865, 888
	LO and NAO	7	1	2	2	-	-	256, 607, 357, 443, 378, 838, 893
	SP, LO, and NAO	11	3	5	1	2	1	477, 435, 222, 598, 637, 432, 594, 611, 80, 846, 896
	From SP-to-Lead-to-NAO	1	-	-	-	-	-	835
Hybrid modes	SP-HYBRID: NAO	1	-	-	-	-		831
	SP-HYBRID: LO/NAO, and OTHER	1	-	1	-	-	-	803
	SP-HYBRID: LEAD GROUP	1	-	-	-	-	-	811
	LO-HYBRID	1	-	1	1			521
	HYBRID: LO/NAO and NAO	1	-	-	-	-	-	866
	NAO-HYBRID: SP/LO	1	-	-	-	-	-	806
	NAO-HYBRID: LEAD GROUP	1	-	-	-	-	-	837
	NO MODE YET, HYBRID: LO and NAO	1	-	-	-	-	-	822
Other	SP, LO, and OTHER	1	-	-	-	-	-	398
	LO and OTHER	1	-	-	-	-	-	857
Not mentioned	-	0	-	-	-	-	-	-
Total		35	5	10	6	2	1	

(NAO) governing the network must be trustworthy as perceived by other organizations participating in the network. Another finding is that the contingency factor of goal consensus is more often addressed in the NAO mode of governance compared to the other two. According to Provan and Kenis (2008, p. 240), "the critical issue here is how a network governs its relationships." The NAO differentiates itself from the lead organization and the SP mode of governance because it is a separate organization that governs the network and its activities. Consequently, power becomes concentrated in this administrative entity, primarily when it coordinates all major network-level activities and critical decisions through and by a few individuals acting as a governance body.

We also find that the need for network-level competencies is examined more in brokered than non-brokered modes of network governance. This finding may be explained because the SP mode of governance is "the simplest form" in terms of size. Another explanation is that the original two brokered modes create few-to-many interdependencies in which an internal/external single organization needs to govern many other network participants. Combined with uncertain task environments and external, complex demands imposed upon the network explain the need for network-level competencies (Provan & Kenis, 2008).

By now, we have accumulated a body of empirical network studies that provide various snapshots of network governance configurations, giving us a brief idea of the interplay between (original) contingency factors and (original) network governance modes. In this respect, we also note that we found the original contingency factors in 37 network studies with other modes of governance, suggesting their relevance. Also encouraging are the combinations of original network governance modes displayed in Table 5. We found seven network studies with two combinations of non-brokered and brokered network governance modes, seven with a combination of brokered modes of governance, and 11 studies with all three original modes of network governance. The review yielded one study with two brokered modes of governance and trust, size, and goal consensus (378) and one study with all the original modes and the factors of size, goal, and network-level competencies (896). These preliminary findings allow us to start testing whether the assertions by Provan and Kenis (2008) about network governance hold throughout a range of network cases, sectors, and countries and further develop the contingency

theory of network governance. The latter may be urgent as both Tables 4 and 5 clearly illustrate a gap between the original contingency factors and the hybrid modes of network governance. We are thus left with a need for more understanding of all the mashing and mixing of network governance modes in practice.

Fitness

In their study, Provan and Kenis (2008) adhere to systems-fit (Drazin & Van de Ven, 1985) to determine the internal consistency of multiple contingencies (i.e., trust density, number of network participants, goal consensus, and the need for network-level competencies) with the structural characteristics of network governance modes (non-brokered/brokered governance and participant/external governance). It is important to note that this "[in]consistency between contingencies and a particular mode is based both in terms of the number of [in]consistent [contingency] factors and the extent to which these factors are [in]consistent with characteristics of the governance form" (Provan & Kenis, 2008, p. 241, between brackets added). Despite Provan and Kenis (2008) defining their concept of fit, this definition needs to be adopted and further developed in the literature. In the 184 network studies, we merely find seven studies in Tables 4 and 5 that address, to various degrees, the concept of fit (5; 17; 80; 123; 464; 673; 813), and only the study of Lubell, Jasny, and Hastings (2017) develop the theoretical mechanism of fit. Lubell, Jasny, and Hastings (2017) proposed the idea of "institutional fit," connecting Provan and Kenis's (2008) contingency framework with specific social-ecological conditions and performance characteristics. In addition, they operationalized fit by using a "fitness" measure that represents the correlation between the empirical network and the best possible fitting "ideal" core-periphery model (Borgatti & Everett, 2000). Like Provan and Kenis (2008), this implies that deviations from the ideal configuration should result in lower performance (Drazin & Van de Ven, 1985, p. 515). In their study, network effectiveness is supported by four critical contingencies in the Spartina case, providing substantive proof that a local collaborative partnership coexists with a centralized governance network (Lubell, Jasny, and Hastings 2017, p. 705). The definition of fit adopted is central to the development of contingency theory in terms of comparison under different circumstances. Still, we also propose fundamental in providing alternative directions to develop further Provan and Kenis's (2008) contingency theory of network governance. The study of Jarzabkowski et al. (2022) makes us inclined to believe that explaining network governance requires a more sophisticated, rather than less sophisticated approach to fit than the current body literature shows. Jarzabkowski et al. (2022) show that fit is a temporary network interaction pattern of coming and going of equilibrium.

Part 3: Consequences of network governance modes

In the final part, we explain the consequences of network governance modes, present findings on network-level tensions, and network governance mode evolution. In Table 6, we have categorized the review findings according to these themes.

We find that 47 studies explicitly focus on network effectiveness. Within this group, brokered network governance modes are more related to effectiveness than non-brokered ones. The review reveals several studies that associate (aspects of) network governance with network effectiveness (i.e., 772; 256; 335; 653; 663; 852; 644; 729; 658; 657; 602). In addition, we also observe some studies in which network governance is a condition that, combined with other conditions, explains whether a network is (perceived as) effective (i.e., 80; 443; 650; 598). These findings suggest that network governance is an important explanatory factor for network effectiveness in isolation or in combination with other conditions. However, with some exceptions in the literature, the review shows that network governance modes are not (yet) commonly used to explain network effectiveness.

Network-level tensions

Provan and Kenis's (2008) basic proposition is that "network managers that operate within a network governance mode must recognize and respond to three basic network-level tensions, or contradictory logics (paradoxes), that are inherent in network governance" (Provan & Kenis, 2008, p. 247). As shown in Table 6, network studies exhibiting single or multiple modes of network governance recognize the network tensions of efficiency-inclusiveness, internal-external legitimacy, and flexibility-stability. Note the gaps found for the SP mode and combinations of original network governance modes.

In addition to the original network-level tensions proposed by Provan and Kenis, we also found other network tensions. Ospina and Saz-Carranza (2010) and Saz-Carranza and Ospina (2011) introduced the tension of "unity-diversity" (see also 772; 841). This tension "holds that network participants can both be in a state of being in accord while at the same time having diversity in their properties and processes" (Saz-Carranza & Ospina, 2011, p. 328). The diversity here resembles the interrelated tensions that pertain to the management of cultural diversity examined in the study of Vangen and Winchester (2014). The studies of Berthod et al. (2017) and Bayne, Scepsis, and Purchase (2017) also found other tensions. Berthod et al. (2017) describe the network tension of accountability-autonomy. The fundamental issue here is establishing appropriate monitoring and control without imposing strong constraints on network members that might limit collaboration or minimize their independence, obstructing involvement. Bayne, Scepsis,

TABLE 6 Classification of network governance modes, network tensions, their development, and effectiveness.

Modes		*N* (articles)	Network tensions					Evolution	Effectiveness *N* (articles)
			EI	IEL	FS	UD	Other		
Original modes	SP	12	-	1	-	-	-	SP > NAO	3
	LO	35	1	1	2	1	1	12	10
	NAO	50	5	2	2	3	4	11	11
Hybrid modes	HYBRID: LEAD NETWORK	1	-	-	-	-	-	-	-
	HYBRID: Multiple LOs	1	-	-	-	-	-	-	-
	HYBRID: SP/LO	4	1	1	1	-	1	-	-
	HYBRID: SP/LO, but not formal	1	-	-	-	-	-	-	1
	HYBRID: SP/LO/NAO	1	-	-	-	-	1	-	
Other		37	1	2	3	1	7	5	9
Combinations of original modes	SP and LO	3	-	-	-	-	1	1	1
	SP and NAO	4	-	-	-	-	-	2	1
	LO and NAO	7	-	1	-	-	2	-	2
	SP, LO, and NAO	11	1	1	2	-	2	1	4
	From SP-to-Lead-to-NAO	1	-	-	-	-	-	SP > LO > NAO	-
Hybrid modes	SP-HYBRID: NAO	1	-	-	-	-	-	-	-
	SP-HYBRID: LO/NAO, and OTHER	1	-	-	-	-	-	-	-
	SP-HYBRID: LEAD GROUP	1	-	-	-	-	-	-	-
	LO-HYBRID	1	-	-	-	-	-	-	-
	HYBRID: LO/NAO and NAO	1	-	1	1	-	-	-	-
	NAO-HYBRID: SP/LO	1	-	-	1	-	-	-	1
	NAO-HYBRID: LEAD GROUP	1	-	-	-	-	-	-	-
	NO MODE YET, HYBRID: LO and NAO	1	-	-	-	-	-	-	-
Other	SP, LO, and OTHER	1	-	-	-	-	-	OTHER>SP > LO	-
	LO and OTHER	1	-	-	-	-	-	-	1

Key		
Original modes		
SP	Evolution = 724	Effectiveness = 441, 456, 663
LO	Evolution = 210, 316, 320, 341, 458, 542, 624, 661, 743, 842, 852, 901	Effectiveness = 458, 535, 542, 565, 602, 604, 658, 809, 826, 887
NAO	Evolution = 79, 148, 158, 233, 295, 333, 450, 455, 457, 528, 584	Effectiveness = 123, 158, 455, 650, 655, 727, 772, 810, 856, 886, 899
Original combo's		
SP and LO.	Evolution = 259	Effectiveness: 25.
SP and NAO.	Evolution = 516, 865	Effectiveness = 888
LO and NAO.		Effectiveness = 256, 443
SP, LO, and NAO.	Evolution = 432	Effectiveness = 80, 432, 598, 637
From SP-to-lead-to-NAO	Evolution = 835	
Hybrid combo's		
NAO-HYBRID: SP/LO		Effectiveness = 806
Other combo's		
SP, LO, and OTHER	Evolution = 398	
LO and OTHER		Effectiveness = 857

and Purchase (2017) mention the effectiveness-efficiency tension in their study of how strategic network processes influence their performance at the network level. In essence, this tension encapsulates the competing demands of producing desired outcomes in a way that wastes the least time, effort, and resources (cf. 884). In addition, van Duijn, Bannink, and Ybema (2022) find two other tensions: the decentralization tension involving centralization versus decentralization (cf. 852) and the collaboration tension involving integration versus differentiation. Their study distinguishes between these tensions based on vertical and horizontal relations, allowing them to clarify how both intersect and what strategies to navigate these tensions and deal with their consequences. Several studies make mention of the various trade-offs between competing demands or logic, often explained in (implicit) terms of paradox (i.e., 813). The study by Vangen and Huxham (2012) elaborates that dealing with a so-called goal paradox is central to the principle and the enactment of collaborative advantage. Vangen and Huxham (2012) examine the underlying nature of goal congruence and diversity in collaborations and how the characteristics of goals in collaborations influence organizations' ability to agree on the joint goals for the collaboration. Many network studies addressing network tensions in one way or another point to balancing these tensions through various properties and processes (i.e., 432; 843) or even cultivating them by managing network behavior (i.e., 450; 865).

Evolution of network governance modes

Finally, we take stock of the empirical literature citing Provan and Kenis (2008) on how network governance modes evolve. Provan and Kenis (2008, p. 247) assumed that if networks survive over time, it is likely that network governance modes will develop according to predictable patterns. More specifically, they proposed that a likely development path is a non-brokered governed network evolving into a brokered governed network. The opposite, an NAO or LO mode developing into a shared participant, was proposed to be more unlikely (Provan & Kenis, 2008).

In Table 6, we show 24 network studies with a single mode of governance that address its evolution and five studies with combinations of network governance modes. After reviewing these studies, we find a few that illustrate the developmental paths of network governance mode. The case study of Mitterlechner (2018) shows how the mode of governance evolved from (1) non-governance (period 1) to a (2) hybrid arrangement characterized by non-brokered governance (period 2), to finally a hybrid arrangement characterized by both a non-brokered and brokered mode of lead organization governance (period 3). In another case study, Provan et al. (2011) found that the network could form and become an entity by first developing a shared identity around a common problem because there was a recognized solution in the community, allowing the network, in turn, to coalesce and form an NAO that could build cooperation and information sharing across many organizations (233). The study of Lacatus (2022) on the European Network of National Human Rights Institutions (ENNHRI) describes the transformation of the network from engaging in a participant governance model as an informal network to a lead organization and, more contemporarily, to a NAO. Finally, the study of Owen and Currie (2022) shows that through two periods of trust repair, the governance form of the network changed from a lead organization to a hybrid between a lead organization and shared participant-led governance. Similarly, Lubell and Robbins (2021) found that the polycentric system for sea-level rise adaptation started with a centralized set of actors, which evolved to a more decentralized structure. Together, these few studies demonstrate a variety of development paths that network governance modes can take.

WHERE DO WE STAND, AND WHERE DO WE GO FROM HERE?

In this study, we took stock of the empirical literature on the governance of organizational networks, citing Provan and Kenis (2008). In Table 7, we portray an overview of the main features of 184 empirical articles on network governance, and in Table 8, we summarize the main findings of the systematic literature review. This section aims to stimulate a research agenda by addressing several gaps in the empirical literature that merit further attention to develop a contingency theory of network governance. These gaps comprise, first, a focus on network governance modes dimensions and practices; second, advancing a better grasp of systems fit based on the consistency and coverage of original and other contingency factors; third, network level tension management; fourth, network governance mode evolution, and finally, network governance as an explanatory factor of network effectiveness.

The network governance modes have been adopted in the empirical literature, and their underlying premises are substantiated by various network studies, at least implicitly. The empirical literature, however, needs more explanations for differences in governance modes and provides even fewer explanations for the outputs or outcomes of network governance modes. The premise of non-brokered internal network governance generally holds in the empirical literature. However, we found other means to support and coordinate network activities in SP modes of governance: governance arrangements such as co-leadership roles (Wister et al., 2014), the appointment of a manager or installment of a management system (Willem & Gemmel, 2013), or a multi-organizational team and a network steering group. Such means allow networks to differentiate their members among governance bodies or roles functionally.

TABLE 7 Overview of the features of 184 empirical articles on network governance.

Features	Overview
Population and sample	Between 2009 and 2022 the core article of this review (Provan & Kenis, 2008) has been cited 1837 times according to Web of Science and 5166 in Google Scholar. A recent analysis of Web of Science showed that of the 1837 publications listed there citing the article, it appeared in a total of 110 different Web of Science categories.
Years and sample	The span of years: 2009–2022. From 1357 we included 184 studies for review.
Source	The main source of articles is in Public Administration journals. The top 5 journals in PA consists of JPART ($n = 19$), PMR ($n = 18$), IPMJ ($n = 8$), PA ($n = 7$), and PAR ($n = 7$).
Country	The top 10 network studies reporting a single country were biased toward the United States (and Canada), Europe (Belgium, the Netherlands, Italy, Switzerland, and Germany), the UK, Australia, and Brazil. 42 studies examined networks in two or more countries, with nine studies having an intra-regional focus and 14 studies even portraying a global scope.
Sector	17 sector classifications. The sector of human, health, and social work activities is the most prominent (68 articles, 40%), followed by the sector of public administration, defense, and social security (33 articles, 20%), the tied sectors of manufacturing (12 articles, 7%) and professional, scientific and technical activities (11 articles, 7%), agriculture, forestry, and fishing, eight articles (9 articles, 5%). We also found 16 studies examining networks in multiple sectors.
Type of study	85% of the network studies adhere to single-, comparative- or multiple-case research design, 15% to survey research.
Type of data	77% of the network studies use cross-sectional data, 23% longitudinal data.
Type of analysis	64% of the network studies conduct qualitative analysis, 18% quantitative analysis, 10% QCA and 8% social network analysis.

Consistent with Provan and Kenis (2008), the lead organization mode is adopted in the empirical literature. However, we also found traits that differ from Provan and Kenis's (2008) original conception. For instance, the lead organization can be temporary (Van Meerkerk & Edelenbos, 2014) with provisional authority (Hermansson, 2016). Moreover, lead organization modes can be mandated through a contract (Chen & Graddy, 2010; Provan et al., 2009) or by governmental assignment (Vermeiren et al., 2020). In addition, we found that the lead organization mode of network governance can change over time (Alvarez et al., 2010; Moretti & Zirpoli, 2016; Provan & Huang, 2012) and, as such, can carry history (Moretti & Zirpoli, 2016; Vasavada, 2013).

Regarding the NAO, we observed that many NAOs are multi-tiered, having multiple levels or bodies arranged in various ways. A neat example of this can be found in studies by Vangen et al. (2015) and Cornforth et al. (2015). Iborra et al. (2018) even differentiated NAOs based on a board structure, suggesting that these different governance bodies have distinguishing characteristics (cf. Planko et al., 2017). These studies confirm the criticality of being neutral. For instance, Fedorowicz et al.'s (2018) study depicted an NAO as an independent governing body allowing public safety networks to attain public safety goals and improve data sharing and communication. In addition, Gibb et al. (2017) described the NAO as a neutral body created to govern the interests of its members and provide strategic and innovative guidance and a skill set to its network members. Being neutral does not mean NAOs lack control, authority, or influence over others. Rather, NAOs can be known for their power dependencies impacting their design and governance (Saz-Carranza et al., 2016).

The analysis showed that network governance modes are different, affecting network effectiveness (cf. Provan & Milward, 1995). Moreover, findings on network governance modes suggest that they differ not only in kind based on brokered/non-brokered and internal/external governance dimensions but also in degree within each kind. These findings necessitate that we classify under what conditions and for what specific uses a network governance mode is employed to achieve integration of a group of organizations working together to accomplish a collective set of tasks. Specifically, we propose that network governance dimensions need a systematic inquiry to elucidate how organizational networks are governed. Related to this, focusing on network practices of how networks govern themselves is another promising avenue (Mueller, 2021).

The analysis also demonstrated that despite the many citations Provan and Kenis received in the last 10 years, we still need more evidence on what explains the differences in outcomes of network governance modes. For instance, the review indicated that the SP mode in general and the original contingency factors in specific should be examined more than in brokered modes of network governance. However, the substance of the evidence after synthesizing these studies left us with many open questions. Concerning the shared participant mode, organizational networks consisting of a relatively small number of organizations working together as a network but with no distinct governance entity may be less preferred as a form of organizing despite being depicted as the simplest form of a network (Kenis & Provan, 2009). In practice, having the governance residing entirely with the network members themselves is more complex than organizing it around a focal network member or a distinct, formal administrative entity (cf. Lindencrona et al., 2009; Raeymaeckers, 2015; Raeymaeckers & Kenis, 2016).

What surprised us was that only a few network studies focused explicitly on what, how, and when of network

TABLE 8 Overview of the main findings of 184 empirical articles on network governance.

Key constructs of the contingency theory of network governance	Main findings
Network governance modes	The three network governance modes, (1) Shared participant mode, (2) Lead organization mode, and (3) NAO mode, are all present in the empirical body of network literature. There is a clear focus on NAO over SP and LO, both in single-mode studies (50 articles on NAO, 35 on Lead and 12 on Shared) and in multiple-modes studies (80% of the articles include NAO). The focus in the empirical literature remains at the three original modes (64% of the single modes studies; 72% of the multiple modes studies), but hybrid (7% for single mode, 27% for multiple modes) and other network governance modes (25% for single mode, 3% for multiple modes) are studied as well. A small number of studies (3% or 6 articles) do not (or only implicitly) mention the network governance mode.
Contingency factors	The main finding here is that explaining the variations of governance modes with the original contingency factors remains challenging because the evidence is small and primarily anecdotal. The original contingency factors are present in 37 network studies with other modes of governance. Seven network studies focus on two combinations of non-brokered and brokered network governance modes, seven others on a combination of brokered modes of governance, and 11 studies on all three original modes of network governance. There are no articles that focus on the original contingency factors in combination with hybrid modes of network governance.
Fit	Seven studies address, to various degrees, the concept of fit and 1 study develops a theoretical mechanism of fit.
Network tensions	Network studies exhibiting single or multiple modes of network governance recognize the network tensions of efficiency-inclusiveness, internal-external legitimacy, and flexibility-stability. In addition to the original network-level tensions proposed by Provan and Kenis, other network tensions can be found as well (in single articles): unity-diversity, accountability-autonomy, effectiveness-efficiency, centralization versus decentralization, integration versus differentiation.
Network governance mode development	24 network studies with a single mode of governance address its evolution and five studies with combinations of network governance modes do the same.
Network effectiveness	47 studies explicitly focus on network effectiveness (either in isolation or in combination with other conditions).

governance modes under conditions of interdependence and uncertainty, making corroboration on what explains the differences and outcomes of network governance modes challenging. For instance, many studies addressed network trust in studies exhibiting the lead organization mode. However, we still cannot confirm if this mode is most effective for achieving network-level outcomes when trust is narrowly shared among network participants, goal consensus is moderately low, and the need for network-level competencies is moderate among a relatively moderate number of network participants (Provan & Kenis, 2008). We call for more network studies that compare multiple network governance modes and, that is, their different needs for network-level competencies since a distinction in which contingency factor explains what is being coordinated and with which mode under certain circumstances is critical for understanding whether networks work.

Another issue worth investigating further is examining fit and network effectiveness. Consistent with earlier critiques of contingency theory in management and organization sciences (cf. Donaldson, 2001; Schoonhoven, 1981), we propose that Provan and Kenis (2008) may need more clarity in assumptions regarding the systems approach toward establishing fit. With system-fit as its primary theoretical mechanism (Drazin & Van de Ven, 1985), a contingency theory posits, on the one hand, that there is no one best way to organize and, on the other hand, that any form of organizing is not equally effective under all conditions (Donaldson, 2001; Galbraith, 1974). Systems-fit emphasizes the need to adopt a type of analysis that allows examining patterns of consistency (both in terms of the number of consistent contingency factors and the extent to which these factors are consistent with network governance modes properties) as well as determining coverage (in terms of cases between the network governance mode and the set of contingency factors, and network effectiveness as the outcome) among network configurations, practices, and outcomes under particular circumstances (Drazin & Van de Ven, 1985; Miller, 1981; Raab et al., 2013, 2015; Willem & Gemmel, 2013).

Despite Provan and Kenis (2008) being explicit in their assumptions and boundary conditions under which conditions modes of network governance are adopted and proposed to be effective, they draw primarily on broad

network conceptualizations, which the literature hesitates to adopt. Examples are the concept of network trust density or the aspects of the content and process of network goal consensus (Provan & Kenis, 2008). Similarly, network-level competencies and network size must be more precise about operationalizing these contingency factors, especially if we move away from the monolithic view due to differentiating in network domains (Steelman et al., 2021). Consequently, the overall explanation of why network governance modes are adopted is accepted in the literature. However, the underlying substance regarding how networks govern themselves under which circumstances remains open for discussion. As of today, all of the eight propositions of Provan and Kenis are still to be verified, calling for network studies focusing more on network governance practices and mechanisms to explain what happens inside an organizational network (Berthod et al., 2017; Mueller, 2021; Vermeiren et al., 2020).

Other often-heard critiques of contingency theory are simplifying the underlying core elements, viewing the fit between these elements as static rather than a dynamic equilibrium, or suggesting singular associations and linear relationships (Van de Ven et al., 2013). In a certain sense, these criticisms also apply to the theorem of Provan and Kenis. We found little evidence of managing network tensions across governance modes and even fewer studies examining the development paths of network governance modes. Hence, there is a clear need to study organizational networks not only during a more extended period (Reypens et al., 2019; Siciliano et al., 2021) at different levels of analysis (H. Yang & Lemaire, 2022) but also incorporate the idea that states of fit and misfit are temporary in nature and alternate when the context, structure, or performance of the network changes (Sedgwick et al., 2022).

The few studies investigating network governance mode development show we might need to revisit network developmental paths. This is timely since, recently, Nowell et al. (2019) proposed that networks are in some manner interdependent as part of a broader (network) ecology in organizational fields. This carries consequences for network governance explanations as environmental conditions and population dynamics are placed at the center of how networks are shaped and constrained (Nowell & Albrecht, 2023; van den Oord et al., 2020; Z. Yang & Nowell, 2021). The literature on the governance of organizational networks has not surprisingly focused mostly on "intra-" network mechanisms and dynamics rather than mechanisms and dynamics between networks or at the level of communities and organizational fields. Such explanations require other theoretical traditions than contingency theory (Raab et al., 2015).

Finally, we need more systematic research to substantiate network governance as an explanatory factor of network effectiveness. A relative lack of work on network governance mode outcomes may be ascribed to studying organizational networks as the unit of analysis. Not disentangling the governance mode as an essential variable in the network governance mode-network interface prevents advancing our knowledge of network governance modes' performance as a subpart of overall network effectiveness. Studying organizational networks requires a multi-level focus on effectiveness, examining the mode of governance as a network property and outcome, like studying interactions among various organizations participating in the network (Tasselli et al., 2015). Future research requires more systematic research to substantiate network governance as an explanatory factor of network effectiveness, including a multi-level focus on effectiveness.

CONCLUDING REMARKS AND OUTLOOK

Based on the systematic literature review findings, we provide insights into how the contingency theory of network governance by Provan and Kenis has been developed into an established and recognized research agenda since 2007. We offer means to summarize and synthesize key findings on the modes of network governance, contingency factors, and network-level tensions.

We conclude that the governance of organizational networks as a vocabulary has been adopted in the management and organization sciences literature to explain organizational networks' development, functioning, and effectiveness. However, further theoretical development and testing are warranted to inform the practice of network governance, particularly when, how, and why to use institutions and structures of authority and collaboration to allocate resources and coordinate and control joint action within and between organizational networks.

Based on our assessment, the findings on the contingency factors as explanatory factors are suggestive and circumstantial. Most studies neglect to examine them, and only a few studies implicitly used them as explanatory factors, providing anecdotal case evidence. We, thereof, need explanations about network governance modes and their outcomes. This systematic literature review shows that the original premise of Provan and Kenis (2008) is substantiated by a diverse body of work examining network governance in various ways and contexts. However, no study comprehensively validated Provan and Kenis' network governance contingency theory.

From a practice perspective, the paper offers important insights. First, by presenting the breadth and depth of empirical literature on the governance of organizational networks, it becomes clear that practitioners should consider participating in organizational networks and developing a serious organizational design addition to their strategic portfolio. In his classic publication "Structures in Fives," Mintzberg (1993) presented five organizational structures, each of which were *ego*centric (from the perspective of the single organization), based on a contingency and configuration hypothesis. In his recent book "Understanding Organizations…Finally" (Mintzberg, 2023), he introduces the *eco*centric perspective, that is,

organizations producing value in concert with other organizations. The present study, therefore, provides rich evidence of when and where this form of organization flourishes. Secondly, the study demonstrates that the "governance" of organizational networks needs to be put at the center of attention. This is a result of the article chosen as a starting point for the review. Still, the fact that the article is so widely cited and used in practice proves that the governance of this form of organizing is most difficult to grasp in practice. It is so different from what practitioners know from their experience in independent organizations with their unity of ownership and unity of command. The paper presents different options of how governance for the specific situation of organizational networks can take form or develop. A recent study (Reeves & Pudin, 2022) reported that "wrong governance choices" accounted for 34% of the relative primary share of failure modes of business ecosystems (being by far the highest single factor). This means that practitioners should pay particular attention to their governance when participating in or developing organizational networks. Third, the paper presents ample evidence on which type of governance is the most appropriate. The paper also shows, however, that good advice is hard to come by when it comes to this question. The existing research is rather messy and incomplete at this point. The advice from our research would be to move slowly and deliberately when it comes to developing the appropriate form of governance. What is clear is that no governance is not an option, nor is copying governance as you know it from your independent organization.

The evidence presented in this study is limited in multiple ways. First, the identified empirical studies are biased toward the United States, Canada, Australia, and Europe. Although we designed the systematic literature review with clear and focused objectives and predefined explicit criteria to prevent selection bias, some articles might have yet to be included even though they might be relevant. Second, we scoped this study to use Provan and Kenis (2008) as the seed article for citations in the Web of Science database, but this may hamper the external validity of this study since other theoretical models and definitions are used in the literature to explain the governance of organizational networks (Ansell & Gash, 2008; Emerson et al., 2012; Gulati et al., 2012; Jones et al., 1997; Kapucu & Hu, 2020; Kickert et al., 1997). By supplementing the database in which we provide an overview of which articles we have in/excluded in the review, we aim to increase transparency and provide scholars the means to assess the quality of the study. We believe we have reviewed most studies devoted to Provan and Kenis' theoretical model. Based on the review, we determine that their model is preliminary at best but still provides fertile ground for reimagining and rejuvenating theorizing on the governance of organizational networks.

To generalize the findings and validate Provan and Kenis' network governance theorem, future research should replicate this literature review periodically and systematically to make our understanding of the governance of organizational networks complete and more in-depth. We propose to prototype a PA research platform that provides common features and services for open peer review and open data sharing across multiple journals and knowledge networks. This makes the knowledge available and accessible to everyone who uses Provan and Kenis' network governance theorem for research or practice purposes. However, this requires developing an open science collective knowledge aggregation project that is open-source and community-driven to create new and innovative ways to test and validate Provan and Kenis' theorem without taking stock of the empirical literature from many fields alone or reinventing the wheel each time. By allowing others to use, adapt, and share the content, we hope to encourage scholars and practitioners from many different backgrounds to engage with each other and communicate their research findings and experiences in a clear and accessible way with the ultimate goal of advancing our scientific knowledge on the governance of organizational networks for the benefit of society as a whole.

ENDNOTES

[1] A recent analysis of the Web of Science showed that the 1837 publications that cite the article are distributed over 110 different Web of Science categories.

[2] In the online supplement, the Methodological Supplement describes the article selection process and analysis approach. We also provide details of each study in the Summary Table in the online supplement [A]. The database of the systematic literature review is available online in the online supplement [B] or upon request by email. To reduce the word limit of the article, we opted to use the ID numbers of the included articles that cite Provan and Kenis (2008) in the reported Tables and Figures. When deemed necessary, we report references to authors. The online supplement [J] provides the key to all the references included.

[3] Coding based on classifications derived from Eurostat Ramon - Reference and Management of Nomencalutes. International Standard Industrial Classification of All Economic Activities, Revision 4 (2008). Broad structure is applied (p. 42). Retrieved from: https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf.

[4] To limit the number of words, we use numbers to refer to specific papers as data in the literature review in the results section. Please find the respective bibliographic information in online supplement B (separate Excel document) or online supplement J (now still at the end of the manuscript).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX

Online Supplement:

A = Summary table (MS word file)
B = Analysis table/database (MS excel file)
C = Methodological supplement
D = Sources/journals
E = Network cases
F = Geographical classification
G = Sector classification
H = Type of study, data, and analysis
I = Key for references

Online supplement A: Summary table

Separate Microsoft Word Document given as Supporting Information.

Online supplement B: Analysis table SLR modes of network governance revisited (database)

Separate Microsoft Excel Spreadsheet given as Supporting Information.

Online supplement C: Methodological supplement

Scope and method of review

We conducted a systematic literature review on the empirical literature citing the journal article: Provan and Kenis (2008). We opted for this scope because we are primarily interested in whether and how network governance introduced by Provan and Kenis (2008) has been used and developed since its online publication in 2007. From the ISI Web of Knowledge database (Clarivate, 2019), we extracted all academic publications.

Review approach and data management

In Table 2, we have displayed our review approach (cf. Liberati et al., 2009). The review approach consisted of three sequential steps. The first step was data extraction of articles in the Web of Science database. We extracted, mapped, and assessed 1357 journal articles written in English that cited the seed article reported in the ISI Web of Knowledge database (Clarivate, 2019), covering 15 years (2008–2022). Next, we refined the extraction to the Web of Science database's SSCI.

The second step was screening all titles and abstracts of identified articles and assessing which articles were eligible for further processing. We applied three inclusion/exclusion criteria to determine eligibility based on the core constructs of Provan and Kenis's contingency theory displayed in Table 3. First, given our scope and interest, we excluded articles that did not consider the network as

the unit of analysis (Provan et al., 2007; Raab et al., 2013), were primarily conceptual or descriptive, or mainly contributed by methodological considerations and measurements. Simultaneously, we checked whether articles focused on "network governance" as a topic in the title and abstract using Provan and Kenis's definition of network governance. Finally, we downloaded and fully screened journal articles if the title and abstract were found to be insufficient to assess the article's eligibility. The screening and assessment of eligibility resulted in the exclusion of 1057 articles. Because of this, we omitted the works of Emerson and Nabatchi (2015), Kelman and Hong (2015), Koliba et al. (2011), Leroux et al. (2019), Page et al. (2015), and Vangen (2017) despite being aware of their relevance in the field of public management. In addition, we did not include articles that studied leadership in networks, that is, Cepiku and Mastrodascio (2021), McGuire and Silvia (2009), and Silvia and McGuire (2010), and excluded articles focusing on "collaborative governance" as an alternative to government, state, market, or hierarchy (see Vangen et al., 2015 for an apt distinction between collaborative governance and governing collaborations).

The remaining 300 eligible articles were downloaded, read, indexed, and classified in the third step. We built an Excel database that adhered to the same standard as Provan et al. (2007). Each article was indexed and summarized by ID (author, title, abstract, year of publication, and source), topic (research question, type of study, unit of analysis, type of data, type of analysis, country, sector, and key findings), and network governance themes (network description, network governance mode, network contingency factors, network-level tensions, network evolution, and network effectiveness).

In this last step, we performed four checks to determine if articles were eligible for the review. First, each article was classified on (1) the presence or absence of the three ideal types of network- and other governance modes. When a network governance mode was not described, only implicitly specified, or not mentioned, an article needed to address (2) one or more of the original contingency factors, (3) network tensions, or (4) network governance evolution to be included in the review. When in doubt regarding the inclusion of an article, the first author consulted the second and third authors.

Following this review approach, we excluded another 116 articles, classifying 184 articles on seven core constructs of the network-level contingency theory of network governance by Provan and Kenis. In the online supplement, we have supplemented the database [B] in which we provide an overview of which articles we have in/excluded in the review. Also, the summary table can be found in the online supplement A or by emailing the first author.

Analysis

We prepared, integrated, and coded text accounts from included articles for the analysis and descriptive findings. This allowed us to identify and assess the state of knowledge and remaining gaps in the key constructs of the Provan and Kenis theorem. To be able to conduct the analysis, we coded articles on topics (eight variables: year, country, sector, research question, type of study, type of data, type of analysis, and key findings) and network governance themes (seven variables: network description, network governance mode, network contingency factors, fit, network-level tensions, network evolution, and network effectiveness). For the network governance themes, we focused on coding the main emphasis of Provan and Kenis's theorem in each article (Table 3).

Each variable was further analyzed to unpack the substantive content and dimensions. We synthesized (1) network governance modes' properties, (2) what explains their differences, and (3) what—if any—are the consequences of network governance modes. More specifically, we examined how—if at all—network governance modes are related to certain contingency factors, how fit is established, how network tensions are managed, how network governance modes evolve, and whether we can ground the relationship between network governance and network effectiveness based on the included articles.

We studied patterns that repeatedly occurred within and between variables to answer these questions. We aimed to explore why found patterns existed and applied the theoretical explanations of Provan and Kenis (2008) to account for the review's findings if applicable. This involved going back and forth between the patterns of association within and between variables and theoretical explanations. In case the theoretical reasoning of Provan and Kenis (2008) did not suffice, we juxtaposed rival explanations derived from the review to establish the closeness of fit.

Online supplement D: Table on sources

Journals of articles that cite Provan and Kenis (2008).

Times cited	Number of journals	Journals
19	1	*Journal of Public Administration Research and Theory*
18	1	*Public Management Review*
8	1	*International Public Management Journal*
7	2	*Public Administration*; *Public Administration Review*
4	6	*Administration & Society*; *American Review of Public Administration*; *American Review of Public Administration*; *BMC Health Services Research*; *Industrial Marketing Management*; *Organization Studies*; *Social Science & Medicine*
3	5	*British Journal of Management*; *Business & Society*; *International Journal of Integrated Care*; *Journal of Management & Governance*; *Nonprofit Management & Leadership*
2	13	*Accounting Auditing & Accountability Journal*; *European Management Journal*; *European Sport Management Quarterly*; *Governance-An International Journal of Policy Administration and Institutions*; *Health Promotion International*; *Human Service Organizations Management Leadership & Governance*; *International Journal of Public Sector Management*; *Journal of Business & Industrial Marketing*; *Journal of Health Organization and Management*; *Nonprofit and Voluntary Sector Quarterly*; *Policy and Politics*; *Production Planning & Control*; *Public Performance & Management Review*
1	60	*Academy of Management Journal*; *Acta Clinica Belgica*; *Agricultural Systems*; *Annals of The American Academy of Political and Social Science*; *BMC Public Health*; *Business Ethics The Environment & Responsibility*; *Chinese Public Administration Review*; *Community Development Journal*; *Conservation Letters*; *Creativity and Innovation Management*; *Educational Assessment Evaluation and Accountability*; *Educational Management Administration & Leadership*; *Electronic Markets*; *Environmental Innovation and Societal Transitions*; *Environmental Policy and Governance*; *Evaluation and Program Planning*; *Experimental Agriculture*; *Global Governance*; *Health Care Management Review*; *Health Policy and Planning*; *IJISPM-International Journal of Information Systems and Project Management*; *Implementation Science*; *Industry and Innovation*; *International Journal of Innovation Management*; *International Journal of Operations & Production Management*; *International Journal of Public Administration*; *International Relations*; *Journal of Asian Public Policy*; *Journal of Business Research*; *Journal of Destination Marketing & Management*; *Journal of Information Technology*; *Journal of International Business Studies*; *Journal of Knowledge Management*; *Journal of Management & Organization*; *Journal of Management Studies*; *Journal of Risk Research*; *Journal of Social Service Research*; *Journal of Sustainable Tourism*; *Management Accounting Research*; *Measuring Business Excellence*; *Natural Hazards and Earth System Sciences*; *Netherlands Journal of Critical Care*; *Pacific Asia Journal of The Association For Information Systems*; *Perspectives on Public Management and Governance*; *Policy Sciences*; *Policy Studies Journal*; *Public Administration and Development*; *Public Money & Management*; *R & D Management*; *Regional Studies*; *Regulation & Governance*; *Science and Public Policy*; *Social Networks*; *Social Policy & Administration*; *Supply Chain Management-An International Journal*; *Technovation*; *Third World Quarterly*; *Tourism Recreation Research*; *VOLUNTAS*; *World Development*

Online supplement E: Tables on network categories and cases

TABLE E1 Categories of networks.

Categories of networks	Number of articles	Percentage
Collaborative network	105	57%
Emergency crisis response network	11	6%
Governance network	51	28%
Network governance mode	6	3%
Network management	6	3%
Policy network	5	3%
Total	184	100%

Note: Definitions of networks derived from Isett et al., 2011.

TABLE E2 Network cases.

	Network case	Number of articles	Percentage
1	A cross-sector partnership	1	1%
2	A high-reliability network	1	1%
3	A hybrid disaster management network.	1	1%
4	A large not-for-profit (NFP) inter-organizational partnership	1	1%
5	A multi-academy trust (MAT)	1	1%
6	A not-for-profit (NFP) partnership	1	1%
7	A policy network on school safety	1	1%
8	A regional major trauma network (MTN)	1	1%
9	A regulatory network	1	1%
10	A textile manufacturing alliance (TEXALL)	1	1%
11	A university-industry knowledge network	1	1%
12	Action/advocacy networks	2	1%
13	Agricultural development policy networks	1	1%
14	Agricultural food network (innovation network)	1	1%
15	Boston Career Center networks	1	1%
16	Broker organizations	2	1%
17	Business and public networks	1	1%
18	Clusters	5	3%
19	Collaboratives	1	1%
20	Community networks	3	2%
21	Consortium	1	1%
22	Crime and Disorder Reduction Partnerships (CDRPs)	1	1%
23	Crime prevention networks (Safety Houses)	1	1%
24	Cross-sector gobal health partnerships	1	1%
25	Cross-sector partnership	3	2%
26	Cross-sector partnership climate Net	1	1%
27	Cross-sector partnerships	3	2%
28	Disaster liquidity insurance pool (interorganizational system)	1	1%
29	Disaster response networks	1	1%
30	Eco-compensation networks	1	1%
31	Emergency crisis response network	1	1%
32	First Steps, a child education and development (CED) network	1	1%
33	Global cross-sector partnership	1	1%
34	Global cross-sector partnerships	2	1%
35	Health and social care delivery network	10	5%
36	Health and social care delivery networks	31	17%
37	Healthinnovation (innovation network)	1	1%
38	Hospital networks	1	1%
39	Innovation network	2	1%
40	Innovation network of the EMIF project	1	1%
41	Innovation networks	2	1%
42	Inter-governmental network	1	1%
43	Knowledge discovery networks	1	1%
44	Lead organization	1	1%
45	Multi-organizational international non-governmental organization families	2	1%
46	Municipal networks	2	1%
47	NAO	1	1%

(Continues)

TABLE E2 (Continued)

	Network case	Number of articles	Percentage
48	Network managers of educational Collaborative Networks (ECNs)	1	1%
49	Network managers of health and social care delivery networks	2	1%
50	Network managers of network organizations	1	1%
51	Network managers of public service delivery networks	1	1%
52	Network managers of various networks	1	1%
53	Network of networks	3	2%
54	Network orchestration organizations	1	1%
55	North American Quitline Consortium (NAQC)	1	1%
56	Partnerships	2	1%
57	Policy network	1	1%
58	Port network	2	1%
59	Project goal-directed networks for natural hazards	1	1%
60	Public health network	1	1%
61	Public safety network	1	1%
62	Public sector network	1	1%
63	Public service delivery network	1	1%
64	Public service delivery networks	3	2%
65	Purpose-oriented network	1	1%
66	Purpose-oriented networks	1	1%
67	Regional networks	1	1%
68	Regional transmission networks	1	1%
69	Regulatory networks	4	2%
70	Spatial projects	2	1%
71	State-based advisory clinical networks	1	1%
72	Strategic networks	9	5%
73	The apprenticeship network	1	1%
74	The British Columbia Network for Aging Research (BCNAR)	1	1%
75	The buyer network within the Dutch medical supply network	1	1%
76	The City Local Safeguarding Children's Board (the CLSCB)	1	1%
77	The crisis response network in Hurricane Katrina	1	1%
78	The ERZgesund—Gesunde Unternehmen im Erzgebirgskreis	1	1%
79	The European Coalition for Vision (ECV)	1	1%
80	The European Network of National Human Rights Institutions (ENNHRI)	1	1%
81	The farm-to-process industry network	1	1%
82	The Flemish elite sport network (FESN)	1	1%
83	The Global Outbreak Alert and Response Network (GOARN)	1	1%
84	The Global Partnership for the Prevention of Armed Conflict (GPPAC)	1	1%
85	The Global Partnership to Stop tuberculosis (TB)	1	1%
86	The Gujarat disaster management network	1	1%
87	The humanitarian aid network responding to Syrian refugees within Jordan	1	1%
88	The Incident Command Systems (ICS)	1	1%
89	The National Alliance for Broader Impacts (NABI)	1	1%
90	The National Industrial Symbiosis Programme (NISP)	1	1%
91	The National Program for Youth at Risk in local authorities in Israel	1	1%
92	The Nestlé Nespresso AAA Sustainable Quality Program	1	1%

TABLE E2 (Continued)

	Network case	Number of articles	Percentage
93	The North American Quitline Consortium (NAQC)	1	1%
94	The Rapid Alert System for Feed and Food (RASFF) network	1	1%
95	The sea-level rise governance network for San Francisco Bay	1	1%
96	The SEMiconductor MAnufacturing TECHnologies (SEMATECH)	3	2%
97	The Southern Alberta Child and Youth Health Network (SACYHN)	2	1%
98	The Venice Film Festival and its local hospitality system	1	1%
99	Tourism networks	2	1%
100	University network	1	1%
101	Urban projects	2	1%
102	Value chains	1	1%
103	Water regional planning networks	1	1%
104	Wildfire response networks	1	1%
	Total	184	100%

Online supplement F: Geographical classification

TABLE F1 Continents of the world.

Continents	Number of articles
Africa	2
Asia	10
The Caribbean	0
Europe	73
North America	43
Oceania	9
South America	5
Total[a]	142
Intra-continental	12
Inter-continental	30
Total[b]	42

[a]Based on single-country studies.
[b]Based on multi-country studies.

TABLE F2 Single countries reported in the included articles.

	Single country	Number of articles	Percentage
1	The United States	36	25%
2	Belgium	16	11%
3	The Netherlands	14	10%
4	The UK	9	6%
5	Australia	8	6%
6	Italy	7	5%
7	Switzerland	7	5%
8	Canada	6	4%
9	Germany	6	4%
10	Brazil	4	3%
11	China	3	2%
12	England	3	2%
13	Sweden	3	2%
14	Ireland	2	1%
15	Israel	2	1%
16	Kenya	2	1%
17	Norway	2	1%
18	Singapore	2	1%
19	Spain	2	1%
20	Columbia	1	1%
21	France	1	1%
22	Haiti	1	1%
23	India	1	1%
24	Jordan	1	1%
25	New Zealand	1	1%
26	Portugal	1	1%
27	Turkey	1	1%
28	Total	142	100%

TABLE F3 Number of articles that reported combinations of multiple countries.

Multi-country or global	Number of articles	Combinations
2	11	Italy and Brazil, the UK and Ireland, England and Wales, the Netherlands and China, the United States and Canada (3), Canada and Sweden, France and Australia, Romania and China, and Germany and the United States
3	3	The Netherlands, Spain, and Taiwan (2); Finland, Spain, and the United States
4	1	The Netherlands, Denmark, Estonia, and the Czech Republic
5	1	Germany, Austria, the United States, the UK, and Switzerland
5+	4	Switzerland, Costa Rica, Colombia, Guatemala, Mexico, and Brazil; Germany, the United States, Canada, and 11 countries in the Baltic Sea Region; Australia, Canada, China, Germany, Finland, Iceland, Iran, Lithuania, Norway, and the UK; the Netherlands, the UK, Sweden, the United States, Turkey, Spain, Pakistan, Italy, and Germany
The EU	6	
Global (incl. combo's)	16 (5 combo's)	East Africa, West Africa, and South Africa; Latin America, the Caribbean, Africa, the South Pacific, the UK, the EU, and the United States; The EU and Global; The United States and Global (2)
Total	42	

Online supplement G: Sector classification

TABLE G1 Single sector classifications[a].

	Single sector	Number of articles	Percentage	Articles ID
1	Activities of extraterritorial organizations and bodies	7	4%	557, 219, 772, 692, 429, 240, 450
2	Administrative and Support Service Activities	2	1%	477, 847
3	Agriculture, forestry, and fishing	9	5%	259, 195, 174, 33, 210, 770, 123, 803, 337
4	Arts, entertainment, and recreation	7	4%	200, 542, 378, 811, 837, 886, 888
5	Education	6	4%	152, 148, 432, 655, 656, 809
6	Electricity, gas, steam, and air conditioning supply	3	2%	262, 806, 856
7	Environmental, conservation, and wildlife organizations	2	1%	850, 852
8	Human, health, and social work activities	68	40%	527, 535, 598, 637, 256, 662, 724, 5, 727, 244, 316, 296, 24, 621, 399, 607, 39, 48, 333, 650, 594, 644, 79, 455, 398, 456, 671, 233, 624, 458, 249, 472, 336, 445, 319, 731, 729, 636, 300, 80, 17, 805, 810, 812, 814, 826, 828, 838, 841, 842, 843, 844, 846, 849, 851, 854, 858, 861, 866, 872, 873, 879, 885, 887, 889, 894, 895, 896
9	Information and communication	1	1%	548
10	Manufacturing	12	7%	684, 804, 807, 825, 831, 853, 857, 883, 884, 897, 899, 901
11	Mining and quarrying	1	1%	426
12	Professional, scientific, and technical activities	11	7%	320, 406, 584, 341, 295, 545, 206, 91, 863, 865, 891
13	Public administration and defense; compulsory social security	33	20%	435, 222, 558, 528, 404, 597, 521, 158, 446, 653, 663, 611, 223, 457, 604, 47, 673, 26, 443, 619, 661, 196, 652, 658, 632, 441, 602, 813, 819, 855, 876, 893, 898
14	Transportation and storage	3	2%	253, 3, 503
15	Wholesale and retail trade	1	1%	516

TABLE G1 (Continued)

	Single sector	Number of articles	Percentage	Articles ID
	Alternative sector classifications			
16	Human rights	1	1%	835
17	Post conflict development	1	1%	890
	Total	168	100%	

[a]Classifications derived from Eurostat– Ramon—Reference and Management of Nomencalutes. International Standard Industrial Classification of All Economic Activities, Revision 4 (2008). Broad structure is applied (p. 42). Retrieved from: https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf.

TABLE G2 Multi-sector classifications[a].

	Multi-sector	Number of articles	Percentage	Articles ID
1	Construction and manufacturing	1	6%	808
2	Education; human, health, and social work activities	3	19%	464, 822, 836
3	Manufacturing; wholesale and retail trade	3	19%	743
4	Manufacturing; arts, entertainment and recreation, professional, scientific, and technical activities	1	6%	266, 410, 824
5	Professional, scientific, and technical activities; human, health, and social work activities	2	13%	541, 657
6	Public administration and defense; compulsory social security; administrative and support service activities	3	19%	335, 666, 565
7	Public administration and defense; compulsory social security; human, health, and social work activities	2	13%	357, 654
8	Public administration and defense; compulsory social security; human, health, and social work activities; professional, scientific, and technical activities	1	6%	448
	Total	16	100%	

[a]Classifications derived from Eurostat– Ramon—Reference and Management of Nomenclatures. International Standard Industrial Classification of All Economic Activities, Revision 4 (2008). Broad structure is applied (p. 42). Retrieved from: https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf.

Online supplement H: Types of study, data, and analysis

TABLE H1 Types of study.

Types of study	Number of articles	Percentage
Single case study	77	42%
Comparative case study	11	6%
Multiple case study	69	38%
Survey research	27	15%
Total	184	100%

TABLE H2 Types of data.

Types of data	Number of articles	Percentage
Cross-sectional	142	77%
Longitudinal	42	23%
Total	184	100%

TABLE H3 Types of analysis.

Types of analysis	Number of articles	Percentage
Qualitative analysis[a]	118	64%
Qualitative comparative analysis	18	10%
Crisp-set	7	
Fuzzy-set	11	
Quantitative analysis	34	18%
Social network analysis	14	8%
Total	184	100%

[a]This includes studies that apply a combination of qualitative analysis techniques with social network analysis.

Online supplement I: Classification of articles with single or multiple modes

TABLE I1 Classification of articles with single modes.

Articles with a single-mode	Modes	Number of articles	Percentage	Articles ID
Original modes	SP	12	8%	464, 724, 663, 456, 249, 472, 336, 319, 441, 17, 847, 897
	LO	35	24%	320, 743, 535, 662, 152, 406, 316, 597, 341, 210, 200, 503, 542, 604, 47, 654, 624, 458, 661, 196, 565, 658, 632, 602, 809, 814, 826, 841, 842, 852, 863, 872, 887, 890, 901
	NAO	50	34%	772, 692, 253, 528, 584, 148, 404, 727, 195, 296, 24, 621, 429, 158, 446, 39, 48, 333, 123, 650, 79, 455, 655, 457, 684, 295, 26, 671, 262, 233, 206, 445, 619, 450, 652, 410, 337, 636, 91, 804, 810, 813, 844, 849, 850, 856, 883, 886, 898, 899
Hybrid modes	HYBRID: LEAD NETWORK	1	1%	876
	HYBRID: Multiple LOs	1	1%	825
	HYBRID: SP/LO	4	3%	244, 885, 889, 891
	HYBRID: SP/LO, but not formal	1	1%	836
	HYBRID: SP/LO/NAO	1	1%	843
Other		37	25%	557, 219, 541, 5, 399, 33, 3, 770, 666, 644, 223, 673, 545, 240, 266, 731, 729, 548, 656, 300, 657, 805, 808, 812, 819, 824, 828, 851, 853, 854, 855, 858, 861, 879, 884, 894, 895
Not mentioned		6	4%	527, 335, 653, 426, 448, 873
Total		148	100%	

TABLE I2 Classification of articles with multiple modes.

Articles with multiple modes	Modes	Number of articles	Percentage	Articles ID
Combinations of original modes	SP and LO	3	8%	259, 558, 174
	SP and NAO	4	11%	516, 807, 865, 888
	LO and NAO	7	19%	256, 607, 357, 443, 378, 838, 893
	SP, LO, and NAO	11	31%	477, 435, 222, 598, 637, 432, 594, 611, 80, 846, 896
	From SP-to-Lead-to-NAO	1	3%	835
Hybrid modes	SP-HYBRID: NAO	1	3%	831
	SP-HYBRID: LO/NAO, and OTHER	1	3%	803
	SP-HYBRID: LEAD GROUP	1	3%	811
	LO-HYBRID	1	3%	521
	HYBRID: LO/NAO and NAO	1	3%	866
	NAO-HYBRID: SP/LO	1	3%	806
	NAO-HYBRID: LEAD GROUP	1	3%	837
	NO MODE YET, HYBRID: LO and NAO	1	3%	822
Other	SP, LO, and OTHER	1	3%	398
	LO and OTHER	1	3%	857
Not mentioned		0	0%	
Total		36	100%	

Online supplement J: Key for references

ID	Reference
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