Networking and performance in public organizations:

A study of primary schools in the Netherlands

Petra van den Bekerom

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Introduction

1.1 Public organizations and their environments

In this dissertation we study whether public managers' interactions with external organizations and actors in the environments of their organizations contribute to organizational performance. Public organizations are responsible for the delivery and provision of public services on which citizens rely (for example, the provision of education, waste management, water supply, law enforcement, and social services). The standards and criteria for these public services are determined by political actors in the public organization's environment. Consequently, public organizations are held accountable for achieving these standards, that is, the performance of their organizations. Public service performance is considered to have multiple dimensions, such as efficiency (the ratio of outputs to inputs), effectiveness (the extent to which objectives are being achieved), equity (the fairness of the distribution of public services between client groups), and consumer satisfaction (how public services meet or surpass customer expectations) (Boyne, 2002; 2003; O'Toole & Meier, 2011). Performance is the result of management activities, inputs from the environment, organizational processes, and outputs (Scott, 2003; Walker, Boyne & Brewer, 2010; O'Toole & Meier, 2011). A key question in public management research is how public managers 'manage' these inputs, throughputs, and outputs. In this dissertation, we are specifically interested in how managers' networking activities facilitate the transformation from inputs to performance.

The organizational environment, which consists of individuals, organizations, institutions, and events that have the potential to affect the activities or outcomes of the organization, has become one of the most important determining factors in the study of public management (Pfeffer & Salancik, 2003; Rainey, 2009). The environment of an organization can roughly be divided into the external environment and the internal environment (Davidson & Griffin, 2006).

To maintain the quality of or improve services and goods, organizations depend on the stability of several internal elements, including a well-functioning technical system (see Sproull & Goodman, 1990), organizational participants, such as staff and co-producers (see Simon, 1997), and appropriate formal and informal organizational structures (see Weber, 1947; Blau & Scott, 1962; Simon, 1997).[1]

However, no organization is self-sufficient; thus, an organization must exploit resources from the external environment to warrant survival and achieve its goals (Katz & Kahn, 1978;

1 For example, public schools attempt to qualify and socialize students by promoting their cognitive and social skills, respectively (*goals*). To achieve these goals, schools need tangible technologies, such as school buildings and learning materials, as well as educational philosophies, such as Montessori and Dalton (*technical system*). Moreover, schools need cooperation from qualified employees, such as teachers and support staff, and active involvement from parents in the education of their children (*organizational participants*). Finally, schools must standardize and regulate employee behavior to facilitate a smooth educational production process (*organizational structure*).

Pfeffer & Salancik, 2003). This statement is especially true for public organizations because they depend heavily upon public sector orders and financing. In addition, public organizations—more than private organizations—are subject to directions and interventions from elected officials and other political actors and authorities who aim to control and direct them (Rainey, 2009; Miles, 1980; Hall & Tolbert, 2004). Scott (2003) distinguishes between the *task* environment (which involves the munificence and complexity of information and resources) and the *institutional* environment (which involves governmental rules and regulations, as well as norms and values). Analyses of the organizational external environment are often performed along several dimensions that are summarized by the acronym PESTEL (political, economic, social, technological, environmental, and legal) (Johnson & Scholes, 2002, p. 102).

Conceptually, there are two general ways in which the external environment affects the functioning of an organization: (a) by providing the organization with *resources* and (b) by imposing *constraints* that restrict organizational behavior (Pfeffer & Salancik, 2003; Scott, 2003). Resources are defined as "generalized means, or facilities, that are potentially controllable by social organizations and that are potentially usable—however indirectly—in relationship between the organization and its environment" (Yuchtman & Seashore 1967, p. 900). Organizations must exploit the environment for resources and transform those resources into products and services (Scott, 2003). Examples of resources are monetary resources, raw materials, human activity, knowledge, influence, power, and reputation (Aldrich, 2008). According to resource dependency scholars, organizations that are better at obtaining resources generally have better outcomes (Aldrich & Pfeffer, 1976; Pfeffer & Salancik, 2003; Boyd, 1990).

In addition to resources, the organizational environment inevitably incorporates constraints, which facilitate organizational choice and decision-making processes and guard the public's interest (Pfeffer & Salancik, 2003; Rainey, 2009). Examples of such constraints include legal requirements, social requirements and expectations, and technological developments. Some constraints that affect organizational outcomes are defined in terms of their effect on the resources sought by an organization (Aldrich, 2008), while other constraints influence managerial action, organizational structures, and processes (O'Toole & Meier, 1999). These constraints can manifest themselves as both restrictions on the proper functioning of the organization and protective shields (Weber, 1946; Bozeman, 1987). Constraints are often beneficial to the functioning of public organizations. For example, rule-based restrictions ensure worker safety, prevent nepotism and corruption, or direct ethical norms. However, constraints can also be burdensome and crowd out necessary resources from the primary production process.

A predictable and controllable flow of resources and constraints is crucial for maintaining the quality of or improving services and goods (Scott, 2003). Maintaining this steady flow is an important challenge for organizations. The environment in which a public organization

operates is constantly changing (Aldrich, 2008; Emery & Trist, 1965). These changes are often minor fluctuations that can be anticipated and built into service delivery. However, all elements of the external environment might change in unpredictable ways (Boyne & Meier, 2009), and "changes can come from anywhere without notice and produce consequences unanticipated by those initiating the changes and those experiencing the consequences" (Pfeffer & Salancik, 2003, p. 69). Examples of such changes are sudden budget cuts, abrupt changes in client characteristics, or drastic changes in existing rules and regulations. In the public management literature, unpredictable changes in an organization's environment are referred to as "dynamism" (Beard & Dess, 1984), "environmental shocks" (O'Toole & Meier, 2011), or "environmental turbulence" (Boyne & Meier, 2009; Emery & Trist, 1965). It is the unpredictability of environmental changes that creates the biggest challenge in managing the environment (Miles, Snow, & Pfeffer, 1974; Jurkovich, 1974; Beard & Dess, 1984; Boyne & Meier, 2009).

Hence, one core activity of public managers is to manage the environment in order to: (a) *tap resources* from the organization's environment (Aiken & Hage, 1968; O'Toole & Meier, 1999; 2011); (b) *reduce environmental uncertainties*, such as demands, preferences, and orders from the organization's environment (Pfeffer & Salancik, 2003); and (c) *buffer* the organization from *environmental turbulence* (Miner, Amburgey, & Stearns, 1990; O'Toole & Meier, 1999; 2011).

For the external resources and information about constraints that are obtained through public managers' external networking activities to affect the organization's performance, public managers must also manage the internal environments of their organizations. By undertaking hands-on activities to organize and coordinate people, technologies, and the organizational structure, public managers aim to effectuate organizational stability, which is necessary for the transformation of environmental inputs into the delivery and provision of public services and goods (O'Toole & Meier, 1999; 2011).

When managing the external and internal environments of their organizations, public managers interact with a wide array of different organizations and actors. Actors in the external environment are potential sources of support (for example, for the provision of funds, information, staff, and advice) (Meier & O'Toole, 2003; Torenvlied & Akkerman, 2014). By devoting substantial time and energy to interacting with external organizations and actors, such as government organizations, businesses, non-profit organizations, and interest groups, public managers strive to stabilize the flow of resources and constraints. On the other hand, public managers' regular involvement of and consultation with actors within a common hierarchy, such as the board, subordinates, and co-producers, interacts with several features of organizational stability, thereby maintaining a steady production of public services and goods (O'Toole, Torenvlied, Akkerman, & Meier, 2014). Although both external and internal management entail more than just interacting with actors in the environment of an

organization, interactions are a necessary precondition for meaningful external and internal management (O'Toole, Meier, & Nicholson-Crotty, 2005; Meier & O'Toole, 2005).

Interactions with actors and organizations in the organizational environment can occur within structural networks, such as networks created by public programs, as well as within networks created by public managers to facilitate the performance of a single organization (O'Toole, 2015). Public programs are increasingly spread across networks of multiple interdependent organizations (O'Toole, 1997; Rainey, 2009). Therefore, scholars of public management have devoted considerable attention to the effectiveness of interorganizational networks—or "whole networks"—for the implementation and management of public programs (for example, Provan & Milward, 1995; 2001; Agranoff, 2003; Agranoff & McGuire, 2003; Ferlie & Pettigrew, 1996; Schalk, Torenvlied, & Allen, 2010).

The study of public managers' networks is an alternative approach to analyzing networks (Torenvlied & Akkerman, 2014). Rather than taking the perspective of the whole network, studies of managerial networks concentrate on the focal organization and examine how high-ranking managers advance the goals of their own organizations through dyadic relations with actors and organizations in the environment (Huxham, Vangen, & Eden, 2000; Agranoff & McGuire, 2001; Rethemeyer & Hatmaker, 2008), thus applying an "ego-centered" approach (Torenvlied & Akkerman 2014). In the public management literature, the manner in which public managers maintain relations with various organizations and actors is often referred to as *managerial networking* (O'Toole & Meier, 1999; 2011; Meier & O'Toole, 2003).[2] Managerial networking is defined as the relational behavior of managers. Managerial networking combines the *scope* and the *intensity* of relations with actors and organizations in both the internal and external environments of the organization. The conceptualization of managerial networking sketched here is somewhat different from the conceptualization offered by other researchers (O'Toole & Meier, 2011; O'Toole, 2015; Meier & O'Toole, 2005; Torenvlied & Akkerman, 2014). In line with existing studies of managerial networking, Torenvlied and Akkerman (2014) conceptualize managerial networking as "the contact frequency of relations that (high-ranking) managers maintain with *external* actors and organizations – for example, suppliers, stakeholders, clients, alliance partners, regulatory agencies, or political actors and institutions" (p. 845). We argue that this conceptualization is overly simple because—as discussed above—public managers also interact with actors within a common hierarchy. However, the theoretical mechanisms that explain how managerial networking with actors in either the internal or the external environment affects the functioning of organizations clearly differ.

2 Others refer to these networking activities as the external social capital of organizations (Leana & Pil, 2006; Ryu & Johansen, 2015) or the "bridging ties" of firms beyond their sectors (McEvily & Zaheer, 1999).

In this dissertation, we take the so-called managerial networks approach to study the conditions under which managerial networking behavior explains variations in public service performance. Whereas whole networks can be studied best using small-*n* designs in which scholars intensively examine the complexity of all actors interacting in a small number of networks (McGuire, 2002), the networking behavior approach allows for large-*n* investigations of public managers' dyadic relations with various actors (Meier & O'Toole, 2005). Provided that large-*n* and dyadic relation-based studies are carefully designed and "focus on theory with clear concepts and precise measurement," they strengthen the internal validity of inferences regarding networking-performance relationships (Meier & O'Toole, 2005, p. 525), perhaps at the cost of some nuance related to indirect relations that can only be studied in complete networks. The study of managerial networking has become a growth area in public management (for example, Meier & O'Toole, 2003; O'Toole & Meier, 2004; Nicholson-Crotty & O'Toole, 2004; Goerdel, 2006; Hicklin, O'Toole & Meier, 2008; Walker et al., 2010; Akkerman & Torenvlied, 2011). Below we discuss the concept of managerial networking and its relation to performance in more detail. We then discuss the contributions and limitations of existing empirical studies, as well as possible knowledge gaps related to managerial networking and performance.

1.2 Managerial networking and public sector performance

1.2.1 Theoretical background

One widely used model for explaining public service performance is the O'Toole and Meier model of public management (1999; 2011). This model of public management has its roots in the open system perspective (O'Toole & Meier, 2011), implying that in addition to organizational elements, the model includes the environment as a separate determinant of organizational success. According to the O'Toole and Meier model (1999; 2011), organizational performance is a product of environmental forces, past performance, organizational stability, internal management, and external management. Negative environmental forces—that is, environmental turbulence—challenge the organization's necessary stability and consequently negatively affect organizational performance.

Two sets of variables are assumed to help public organizations protect against, insulate against, and mitigate negative impacts on organizational performance. The first set of variables taps the organization's stabilizing features that help the organization bolster its administrative system to protect against externally produced uncertainty and instability (Fennell & Alexander, 1987; O'Toole & Meier, 2011), such as structural, productional, procedural, and personnel stability.

The second set of variables taps internal and external management activities. Internal management activities constitute a manager's efforts to manage inside the organization. There

are numerous forms of internal management. Traditional internal management includes the POSDCORB-like functions (planning, organizing, staffing, directing, co-ordinating, reporting, and budgeting) of public managers. Other forms of internal management include "the various aspects of managing people, or human resources management – such as hiring, orienting new personnel, classifying positions, defining jobs, retaining and promoting people, disciplining and even firing employees, counseling staff, crafting training and development programs, handling grievances and other complaints, resolving interpersonal disputes, dealing with issues of diversity, and much more" (O'Toole & Meier, 2011, p. 131). In general, O'Toole and Meier (1999; 2011) propose that internal management promotes organizational performance by interacting with an organizations' stabilizing features (also see Barnard, 1938; Simon, 1997).

External management encompasses a manager's efforts to interact with the external environment. These external activities are often conceptualized as [external] managerial networking and aim to (a) exploit the environment and (b) buffer against environmental turbulence (O'Toole & Meier, 1999; 2011; Geletkanycz, Brian, Boyd, & Finkelstein, 2001; Pfeffer & Salancik, 2003). First, external managerial networking provides the organization with resources from the organization's external environment (O'Toole & Meier, 1999; 2011; Aiken & Hage, 1968), such as people, money, information, services, and technology. By manipulating the 'raw materials' from the external environment, public managers provide the organization with resources that are necessary for the production of products and services (Scott, 2003). Moreover, information about environmental constraints can reduce environmental uncertainties (Pfeffer & Salancik, 2003). For example, by networking with clients and client interest groups, organizations can learn about client needs and plan for future trends. In addition, networking with government organizations can provide an organization with information about legal requirements and performance standards. Hence, O'Toole and Meier (1999; 2011) hypothesize that [external] managerial networking promotes organizational performance.

Second, networking with external actors and organizations can serve as a *buffer* to help organizations survive and absorb the negative effects of environmental turbulence (Miner et al., 1990; O'Toole & Meier, 2011). By maintaining relations with external organizations and actors, organizations can, if needed, mobilize resources and information for the primary production function of the organization during turbulent times. For example, a sudden increase in client intake could put severe (short-term) pressures on the quality and costs of public services. Establishing and maintaining good relations with actors within a common hierarchy or with more external organizations and actors, such as government organizations, businesses, non-profit organizations, and interest groups, could release the pressure in terms of the provision of labor and/or funds. Hence, O'Toole and Meier (1999; 2011) also hypothesize that managerial networking attenuates the negative effect of environmental turbulence on performance.

1.2.2 Previous empirical research

The last decade has witnessed an upsurge in quantitative empirical studies of the effect of managerial networking on organizational performance, which have been conducted primarily in the United States (Walker & Andrews, 2015). The studies that we discuss here are not exhaustive, but they are representative of the existing literature in the field of public management.

A large body of work has demonstrated a positive direct effect of managerial networking—generally measured as an overall external networking index—on organizational performance (for example, Meier & O'Toole, 2001; 2003; 2008; 2010; O'Toole & Meier, 2003; 2004; 2006; Nicholson-Crotty & O'Toole, 2004; Goerdel, 2006; Meier, O'Toole, Boyne, & Walker, 2007; Meier, O'Toole, & Hicklin, 2010; Walker et al., 2010; Leana & Pil, 2006; Akkerman & Torenvlied, 2011). For example, studies of Texas school districts show that the overall intensity of managerial networking by school district superintendents is associated with higher student scores on standardized tests and lower student drop-out rates in the district's schools (Meier & O'Toole, 2001; 2003; 2008; 2010; O'Toole & Meier, 2003; 2004; 2006). O'Toole and Meier (2004) also show that the benefits of managerial networking are distributed unevenly. Higher-status students profit more than disadvantaged students from superintendents' networking activities. A study of municipal police departments in the United States shows that departments' networking activities improve arrest rates (Nicholson-Crotty & O'Toole, 2004). Dutch colleges for nursing studies that are headed by directors with contacts to more external organizations tend to have lower drop-out rates and higher percentages of satisfied graduates (Akkerman & Torenvlied, 2011).

A few studies report negative effects and/or null findings (Walker et al., 2010; O'Toole & Meier, 2004; Paletta, 2012; O'Toole et al., 2014; Meier et al., 2015). For example, the networking activities of English local government officers have no effect on performance, as measured by the core service performance (CSP) score of the Comprehensive Performance Assessment (CPA) score assigned by the English Audit Commission (Walker et al., 2010). However, when examining the individual effects of each network node, Walker et al. (2010) find that networking with elected members as well as central government officials negatively affects performance. The authors also find that networking with managers in other councils and user group representatives has a positive effect. Meier et al. (2015) compared the impact of managerial networking activities of public managers in similar organizations—public schools—in different contexts, that is, Denmark and Texas. The study shows that school principals' networking activities have no effect on the performance of Danish schools. For Texas schools, the authors find that school principals' contacts with local government agencies and contacts with actors within the hierarchies of the schools (the board, the superintendent, and the central office staff) negatively affect performance, whereas networking with teachers, parents, and other principals has a positive effect on performance. In summary, studies of

managerial networking show mixed results, depending on the context (O'Toole & Meier, 2015).

Although the scope of studies that examine the direct effect of managerial networking on performance is relatively large, only a few scholars have examined the moderating effect of managerial networking on environmental turbulence. Nicholson-Crotty and O'Toole's (2004) study of US municipal police departments shows that departments' managerial networking activities mitigate the negative impact of crime rates on arrest rates. Two studies of Texas school districts report that networking moderated the negative effect of Hurricane Rita. Ryu (2012) reports that managerial networking, which was measured as the "number of key [external] environmental actors," moderated the negative effect of days missed due to school district closure. Using the same measure for environmental turbulence, Ryu and Johansen (2015) show that "pre-disaster" networking for the sake of being prepared for possible hurricanes (or other natural disasters) attenuated the negative effect of Hurricane Rita.

A small branch of public management research focuses on the question of whether managerial networking has diminishing returns. In other words, these studies examine whether there is such a phenomenon as too much networking. Hicklin et al. (2008) indeed find that there is a saturation point for the networking activities of Texas school district superintendents. Although networking activity benefits organizational performance, the returns diminish and the effects can even become negative at high levels of managerial networking. Torenvlied and Akkerman (n.d.) report the same pattern for Dutch primary schools. In the context of the Dutch Social Support Act (SSA 2007), Schalk (2015) finds comparable results for the involvement of professional stakeholder organizations in local governments' policy making.

Another research niche focuses on the question of whether managerial networking enhances the effect of other management variables on performance. O'Toole and Meier (2003) show that the effect of the management quality of Texas school district superintendents on school performance increases when public managers are actively networking with actors in the organization's environment. Meier and O'Toole (2010) report that the interaction of managerial networking and management capacity positively affects school performance.

1.2.3 Limitations of previous research and scientific relevance

Before proceeding with the limitations of previous research, it is important to note that it is beyond the scope of this dissertation to address all limitations and gaps. Below we discuss the important empirical and theoretical limitations of current research on managerial networking and performance that are most relevant to this study. Based on these limitations, we aim to make several theoretical and methodological contributions to the public management literature, specifically to the study of managerial networking.

1.2.3.1 Managerial networking as a multi-dimensional concept

First, although the majority of managerial networking studies show that managerial networking positively affects public service performance, evidence related to the managerial networking-performance relationship remains one-dimensional. It has long been known that different partners bring different benefits to an organization (Moore, 1995; Bozeman, 1987; Rainey & Steinbauer, 1999; Lynn, 2007; Moynihan & Pandey, 2005; Torenvlied & Akkerman, 2012). For example, Moore (1995) acknowledges the involvement of different types of stakeholders in the production of public value and distinguishes among managing upward in the direction of political principals, downward toward organizational agents, and outward in the direction of external actors and organizations (also see: O'Toole et al., 2005). In addition, Bozeman (1987) states that public agencies are surrounded by bureaucratic, political, client, and other types of stakeholder organizations. Yet, most studies of managerial networking theorize about the effect of the overall level of managerial networking on performance and use an overall external managerial networking index. These studies report one general "network activity" effect, regardless of the different types of organizations in the manager's network. For example, Texas school district data consistently report one common factor that underlies the contact frequencies of superintendents towards six different external organizations in the district's environment (for example, Meier & O'Toole, 2003; O'Toole & Meier, 2004).[3]

However, recent theoretical and empirical advancements in the study of managerial networking have shown that public managers differentiate between contacts with different stakeholder groups to achieve different goals (Akkerman, Torenvlied, & Van den Bekerom, 2010; Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015). For example, Torenvlied et al. (2013) explore theoretically whether managerial networking has multiple dimensions. Subsequently, those authors apply cumulative scaling techniques to the Texas School district data and find three distinguishable networking scales that are aimed at 1) securing political support, 2) bureaucratic coping, and 3) co-production. Moreover, the authors find that only bureaucratic coping directly and positively affects performance, while investing in multiple types of networking at the same time has detrimental effects. Torenvlied et al. (2013) show that there are indeed different dimensions of managerial networking and that these dimensions differ in terms of their effects on performance. In response to these recent studies on the multi-dimensional nature of managerial networking, O'Toole (2015) acknowledges the importance of understanding "what may be differing dimensions of managerial networking with different clusters of actors and how these differences matter" (p. 368). In this dissertation, we take into account the *multi-dimensional nature* of managerial networking.

3 In a recent study, Meier et al. (2015) use factor analysis to identify four distinguishable networking scales that underlie the networking activities of Texas school principals and two networking scales for the networking activities of Danish school principals.

1.2.3.2 The conditional effect of managerial networking

A second important shortcoming in the study of the managerial networking-performance relationship is the lack of studies of the manner in which the effect of managerial networking on performance is dependent on environmental factors. A considerable amount of research has studied the direct effect of managerial networking on performance, but although the moderating hypothesis is a key element of the O'Toole and Meier model (1999; 2011), empirical evidence concerning whether managerial networking attenuates the negative effect of environmental turbulence on performance is lacking. Moreover, little is known about how managerial networking moderates the more predictable environmental challenges (that is, constraints) that likewise challenge the organization's functioning. In addition, because only a few studies have linked managerial networking to other management variables (O'Toole & Meier, 2003; Meier & O'Toole, 2010), little information is available concerning whether managerial networking allows managers to leverage more organizational benefits from other management variables. In addition, the fact that existing research on the managerial networking-performance relationship shows somewhat mixed results could be explained by the notion that public organizations need to get the environmental and organizational conditions right to facilitate beneficial managerial networking. Thus, when studying the antecedents of organizational performance, we should include the interactions between managerial networking and environmental variables, as well as the interactions between managerial networking and other management variables. The present study seeks to include these *conditional effects* of managerial networking.

1.2.3.3 The indirect effect of managerial networking

Third, to date, existing studies have neglected to examine how managers' external networking activities that aim to obtain resources and information about constraints from the external environment influence the management activities that facilitate the transformation of these resources and information. According to the open systems perspective, the core elements of organizations are input, throughput, and output (Katz & Kahn, 1978; Scott, 2003). An important assumption of the open systems perspective is that management facilitates the technical flows that transform resources and demands into outputs, which ultimately affects the organization's performance (Scott, 2003). This assumption suggests that external managerial networking *indirectly affects* organizational performance through internal management activities. However, this mediating function of internal management—connecting managerial networking to performance—has not been studied. As Elster (2007) argues, identifying the mechanisms responsible for the relations between variables improves the possibility of making reliable inferences about causality, thus providing more causal depth. A mediating model may offer a more powerful explanation for the managerial networking-performance relation (see also Walker & Andrews, 2015).

1.2.3.4 The empirical context of managerial networking studies

Finally, the majority of studies into the effect of managerial networking on performance have been conducted in the United States. These studies predominantly report positive effects of [external] managerial networking. However, the few European studies of managerial networking report null findings and/or negative effects. With respect to the difference between public schools in Texas (a system with fragmented and adversarial characteristics) and Denmark (a system with unitary and corporatist characteristics), Meier et al. (2015) explain that managerial networking matters more in Texas than in Denmark because "Texas principals can gain power by negotiating the adversarial system, while the corporatist influence of teachers reduces the decision authority of principals in Denmark through collective agreements and important shop stewards" (p. 131). In a recent essay, O'Toole and Meier (2015) acknowledge these mixed findings and present a theory of context that includes how contextual variables—such as the political context, the environmental context, and the internal context of the organizations—affect the management-performance relationship. To test the validity of the managerial networking-performance hypotheses, managerial networking theory should be applied to other contexts besides the United States (specifically, Texas school districts) (O'Toole & Meier, 2015; Meier, Rutherford, & Avellaneda, n.d.).

1.3 Aims, objectives, and overall research question

The main aim of this dissertation is to gain more insights into how public managers' interactions with internal and external organizations and actors in the environments of their organizations contribute to organizational performance. After a careful review of both the theory on the managerial networking- performance relationship and previous empirical research, we pointed out some important theoretical and empirical limitations of the existing literature on managerial networking. Next, we formulate four objectives or steps that outline how we intend to achieve our aim. Based on these objectives, we specify our overall research question and formulate four secondary research questions.

First, we want to gain further insights into the consequences of the *multi-dimensional nature* of managerial networking for our understanding of organizational performance. Thus, we build upon previous studies of the multidimensional nature of managerial networking (Akkerman et al., 2010; Torenvlied et al., 2013; Zhu et al., 2015). Although it has long been known that managers seek support from different "classes" or "types" of external organizations, most public management research still neglects the question of how particular networking dimensions provide specific types of resources. Second, we want to shed more light on the *conditional effect* of managerial networking. Current theoretical insights posit that managerial networking both attenuates the negative effect of environmental turbulence and reinforces the effect of other management activities; however, current empirical research on managerial

networking and performance neglects to include these moderating effects. Third, we take into account the *indirect effect* of managerial networking on performance. For external resources, which are obtained through networking with actors and organizations in the external environment, to affect the organization's performance, public managers must coordinate people and resources within the organization. To date, existing studies have neglected to examine whether public managers' external management activities indeed affect the internal management activities that facilitate the transformation of resources and information.

Fourth, we want to test the managerial networking-performance relationship in a relatively *new context*, that is, Dutch primary education. Only by testing managerial networking hypotheses across disparate contexts can we estimate the generalizability of the managerial networking theory.

The following overall research question of this dissertation reflects these four aims.

- *Research question:* Under what conditions do specific managerial networking dimensions affect public sector performance in Dutch primary education?

From this overall research question, four secondary research questions are derived:

- *SRQ1*: To what extent can we distinguish multiple dimensions of managerial networking in the context of Dutch primary education?
- *SRQ2*: To what extent do different dimensions of managerial networking moderate the effect of environmental challenges on public sector performance in Dutch primary education?
- *SRQ3*: To what extent do different dimensions of managerial networking moderate the effect of other management activities on public sector performance in Dutch primary education?
- *SRQ4*: To what extent are the effects of the different dimensions of managerial networking on public sector performance in Dutch primary education mediated by intermediary variables that precede performance?

To answer secondary research questions 2, 3, and 4, *SRQ1* must be addressed first. As discussed above, we define managerial networking as the networking activities of public managers with actors and organizations in the external and internal environments of the organization. What determines the boundaries of the organization, thus "decoupling" the organization from other elements in its external environment, depends on the study's level of analysis and its substantive focus (Scott, 2003), ranging from individual organizations to networks of organizations. Thus, the environment of a single public school, for example, is assuredly different from the environment of a community school, or other interdependent educational networks. In this

dissertation, the point of departure is the school board. Generally, we assume that interactions with actors within the boundaries of the school organization, such as the school board, other principals of the same board, the participatory council, and subordinates, promote organizational performance by interacting with the school organization's stabilizing features. Actors and organizations external to the boundaries of the school organization (delineated by the school board) shape the school organization's external environment. Interactions with these external actors and organizations promote organizational performance by providing resources and buffering environmental turbulence.

More specifically, we follow Moore's (1995) distinction of managing "upward" toward political principals, "downward" in the direction of subordinates, and "outward" toward external actors and organizations, and explore theoretically how these 'orientations' affect performance. We add a fourth orientation: "sideward" in the direction of peers that are involved in the co-production of public services. On the empirical level, we use a cumulative scaling technique—that is, Mokken scale analysis—to determine whether these managerial networking orientations can be identified (Torenvlied et al., 2013; Zhu et al., 2015). These orientations form the basis of the conceptual models of all empirical chapters.

Networking upward captures managers' networking activities with superiors. For Dutch primary schools, the school board is the main "principal" to the school. Downward-oriented managerial networking (also referred to as team involvement in Chapter 5) refers to contact with subordinates. Networking outward refers to managers' interactions with various types of external actors and external organizations, "such as suppliers, external stakeholders, alliance partners, regulatory agencies, or political institutions" (Torenvlied et al., 2013, p. 252). Dutch primary school principals also need cooperation from peers, such as other school principals, the participatory council, and the parent committee, to properly implement their organizational and educational goals, strategies and programs (Torenvlied et al., 2013). Networking sideward refers to managers' networking activities with such co-producers.

Overall, networking upward, downward, and sideward are considered as expressions of internal management, while networking outward is seen as an external management activity. Our multi-dimensional approach to networking will further contribute to our understanding of the theoretical mechanisms that explain how public managers' networking activities with specific types of actors affect organizational performance. Below we discuss the context of Dutch primary education in more detail.

1.4 Context and research design

1.4.1 Context[4]

In this dissertation, we research Dutch primary school principals. Dutch primary education is the ideal context for this study because the majority of managerial networking studies have been conducted in similar educational settings, that is, public schools. Before testing the generalizability of any theory in contextual situations that differ dramatically from those available in existing sets of studies, it is important to test the theory's explanatory leverage in contexts that are relatively comparable to the contexts of existing empirical studies. In addition, we also chose Dutch primary schools for practical reasons. Primary education is by far the largest public employer in the Dutch public sector, which translates into a large number of potential respondents.

In 2010, 6,848 primary schools were responsible for the education of more than 1.5 million students between four and 12 years of age (Dutch Ministry of Education, Culture and Science, 2011). Dutch primary schools have two main responsibilities: (a) to qualify students by promoting their cognitive skills, primarily in language and arithmetic, and (b) to socialize students by promoting their social and moral development in citizenship behavior (Dutch Education Council, 2008). The main actors accountable for the attainment of these goals and for school performance are the school principal and ultimately, the school board.

In the Netherlands, the executive oversight and administrative powers, such as the internal organization, personnel and employment policies, and the financial management of the school, and ultimately, the school's performance, are assigned to the school board (Turkenburg, 2008). Despite the board's final accountability, school principals are considered to be ideal subjects for the study of managerial networking because school boards delegate much authority and discretion to the school principal.

In practice, most school principals establish the school's educational curriculum; they coach teachers; develop plans for pedagogical quality, student care, and quality control; and monitor student performance. School principals also have considerable administrative duties associated with the day-to-day management of the school. Principals are responsible for the planning of activities, the management of human resources, and the development and maintenance of buildings. School principals are also the main representatives of the school for external contacts and therefore maintain relationships with organizations and actors in the school's environment.

First, primary school principals interact with national government organizations that are involved in the assignment of accountability to schools with respect to student achievements,

4 An extensive discussion of the research context has been published in Torenvlied & Akkerman (2012) and Van den Bekerom, Torenvlied, Akkerman, 2015; 2016).

educational climate, and financial management. For example, the Inspectorate of Education assesses all schools on the same final attainment levels. Most prominent is the standardized Cito test, which provides information about both student progress and the school's performance. Schools that fail to comply with the performance standards are subjected to an intensive supervision regime and an annual evaluation (which is made public). Schools that continue to fail ultimately risk losing their funding. In addition, school principals maintain contacts with other non-governmental organizations at the national level, such as interest groups who lobby with regard to (personnel) policies and regulations.

Secondly, local government—politicians and agencies—outlines the local conditions for the provision of education by making decisions concerning the allocation of resources for school improvements, exerting control over school buildings, and administering rules and regulations for public spaces and public safety. Although some standard contacts exist between schools and the local administration, school principals also partake in lobbying activities to yield local political support (for example, for housing and safety issues).

Finally, education is a co-produced public service, and principals need active involvement from parents in the education of their children, as well as cooperation from teachers and other schools in their board to implement their goals. In addition, each school has a mandatory advisory body that is composed of both parents and staff, who co-determine important educational and management issues together with school management and the school board.

1.4.2 Research design

To answer the research questions outlined above, we test existing hypotheses and derive new hypotheses concerning the managerial networking-performance relationship for the Dutch research primary education context. The empirical part of this dissertation is based on a large-*n* research design. We use both cross-sectional and longitudinal data. Compared to panel and experimental designs, cross-sectional designs are relatively inexpensive and require little time to conduct. Although cross-sectional designs make it difficult to make causal inferences, cross-sectional studies point toward possible associations between variables and are therefore useful in generating hypotheses for future research (Bryman, 2012).

We test our hypotheses using two data sets related to Dutch primary school principals. These data sets contain information from a nation-wide survey of the principals of Dutch primary schools that we conducted in 2010 (wave 1; used in Chapters 2, 3, and 5) and 2013 (wave 2; used in Chapter 4). Using a web-based survey, we asked the school principals, among other topics, about their managerial activities. For example, we asked the school principals about their relations with 41 different types of organizations and actors in the internal and external environments of the school, which enabled us to distinguish between different managerial networking dimensions. Unfortunately, due to space restrictions, the length of the managerial networking scale in the 2013 survey (wave 2) was reduced to fifteen items.

In the first wave, the principals of all Dutch primary schools were invited to participate in the survey by both mail and email. Reminders were sent after two weeks. After six weeks, the response rate was 19.55% (n = 1,348). This rate is comparable to the response rates reported by other studies of Dutch school principals and is substantial given the work pressure on school principals and the prevalence of survey research in this sector. In the second wave, the principals of all Dutch primary schools were invited to participate in the survey by email. Reminders were sent after two, five and eight weeks. After eight weeks, the response rate was 13.29% (n = 896). This rate is lower than the response rate for the first wave.

A non-response analysis for both waves (see Appendix) shows that the schools in our analyses do not differ from all other schools with respect to certain critical characteristics, namely, school performance, the percentage of disadvantaged students, and educational vision. However, larger schools and schools with a Roman Catholic denomination are slightly overrepresented.

The survey data used in the present study were enriched with data from the Dutch Inspectorate of Education and the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency). The Dutch Inspectorate of Education provided us with information about indicators of school performance, including Cito test scores, which is the authoritative, standardized test that is taken by students at the end of the eighth grade. Hence, we use objective school performance data that were measured independently from the survey. The average Cito test score measures the effectiveness of public schools in terms of the extent to which objectives related to language, arithmetic, and study competences are being achieved.

The DUO provided us with a wide range of control variables that capture school, staff, and student characteristics. The data sets were matched based on each school's unique identification number, which is assigned by the Dutch Ministry of Education, Culture and Science—that is, a four digit code that allows the ministry to identify primary schools as separate educational units within school boards.

1.5 Outline of the dissertation

This dissertation is based on four empirical studies that are presented in Chapters 2 to 5. Because the chapters are written as independent journal articles, some overlap between the chapters is unavoidable. The overlap lies primarily in the explanation of the context and the methodology. Table 1.1 provides an overview of the chapters in this dissertation. Moreover, Figure 1.1 presents all the hypotheses tested in this dissertation.

We make no claim that we have covered the entire scope of potentially existing moderating and indirect variables that affect the managerial networking-performance relationship. Instead, we selected variables based on current theoretical insights. Moreover, to avoid over-specification of our statistical models, to answer our research questions, we focus on a few

Table 1.1 Overview of the empirical chapters of the dissertation.

Chapter	Key independent variable	Moderator/ mediator	Measure of school performance (dependent variable)	Hypotheses	Research design
(2) Networking for environmental shocks	Shock (Percentage change in the number of students)	Upward, Downward, Sideward, and Outward networking, (moderators)	Average standardized test scores for 2009-2010	2.1) Percentage change in the number of students negatively affects school performance, and this negative effect is 2.2) reinforced by upward-oriented managerial networking and attenuated by 2.3) downward-, 2.4) sideward-, and 2.5) outward-oriented managerial networking.	Multilevel design with years nested in $n = 523$ schools (fixed effects)
(3) Networking for environmental constraints	Constraint (Perceived external red tape)	Upward, Downward, Sideward, and Outward networking, (moderators)	Average standardized test scores for 2009-2010	3.1) External red tape negatively affects school performance, and this negative effect is attenuated by 3.2) upward-, 3.3) sideward-, 3.4) downward-, and 3.5) outward-oriented managerial networking.	Multilevel design with years nested in $n = 546$ schools (fixed effects)
(4) Making performance management work	Performance management	Upward, Downward, and Outward networking (moderators)	Average standardized test scores for 2010, 2012, and 2014	4.1) Performance management positively affects school performance, and this positive effect is reinforced by 4.2) outward, 4.3) upward, and 4.4) downward managerial networking.	Multilevel design with years nested in $n = 481$ schools (fixed effects)
(5) Transforming input into performance	Upward, Sideward, and Outward networking	Downward networking (mediator)	Average standardized test scores for 2009-2010	5.1) Outward-, 5.2) upward-, and 5.3) sideward-oriented managerial networking positively affect school performance through increased downward-oriented managerial networking.	Path analysis ($n = 547$ schools)

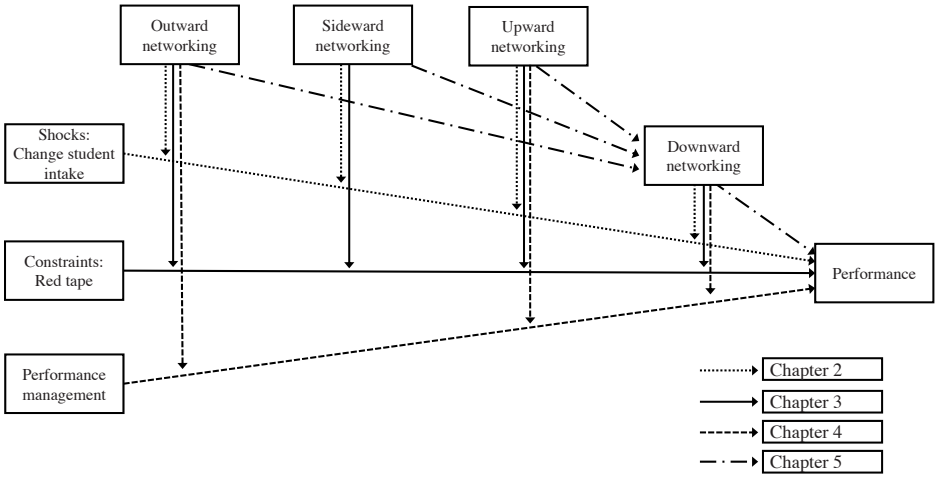

Figure 1.1 Hypotheses of the empirical dissertation chapters.

hypothesized relationships at a time. However, all of the models include a wide range of control variables.

All chapters contribute to answering our first secondary research question concerning the extent to which we can distinguish multiple dimensions of managerial networking in the context of Dutch primary education (SRQ1). In each chapter, we use Mokken scale analysis to determine whether the different managerial networking dimensions—conceptualized as upward-, downward-, outward-, and sideward-oriented managerial networking—can be identified (Torenvlied et al., 2013; Zhu et al., 2015).

Chapters 2 and 3 address the question of the extent to which different dimensions of managerial networking moderate the effect of environmental challenges on public sector performance in Dutch primary education (SRQ 2). The idea that the effect of managerial activities on performance is conditional has been suggested by several scholars in the field of public management (for example, Otley, 1980; Pollitt, 2013). Specifically, the effect of managerial networking on performance is suggested to interact with environmental turbulence (O'Toole & Meier, 1999; 2011; Nicholson-Crotty & O'Toole, 2004; Ryu & Johansen, 2015). However, most managerial networking studies neglect this conditional effect.

In Chapter 2, we examine how the interaction between managerial networking orientations and environmental turbulence, or shocks, which is conceptualized as changes in client populations, affects school performance. Specifically, we study the effect of the percentage change in the number of students (Meier et al., 2010; Boyne & Meier, 2009) on school performance in terms of the schools' average student scores on a standardized test in

2009 and 2010. We focus on the interaction between the percentage change in the number of students and the four networking orientations. We hypothesize that the percentage change in the number of students negatively affects school performance (Hypothesis 2.1). In addition, we expect that this negative effect is reinforced by upward-oriented managerial networking (Hypothesis 2.2) and attenuated by downward- (Hypothesis 2.3), sideward- (Hypothesis 2.4), and outward-oriented managerial networking (Hypothesis 2.5). The hypotheses are tested using a data set related to Dutch primary schools (n = 546; wave 1).

In Chapter 3, we study how managerial networking orientations interact with more predictable environmental challenges, that is, environmental constraints. Environmental constraints are conceptualized as burdensome external rules, regulations, and procedures, that is, red tape. Red tape is a specific type of environmental constraint that, like environmental shocks, challenges the organization's functioning (Bozeman, 1993; 2000). We examine the effect of external red tape on school performance in terms of schools' average student scores on a standardized test in 2009 and 2010. In addition, we examine the interaction between red tape and the four networking orientations. We hypothesize that external red tape negatively affects school performance (Hypothesis 3.1), and this negative effect is attenuated by upward- (Hypothesis 3.2), sideward- (Hypothesis 3.3), downward- (Hypothesis 3.4), and outward-oriented managerial networking (Hypothesis 3.5). The hypotheses are tested using a data set related to Dutch primary schools (n = 523; wave 1).

In Chapter 4, we examine the extent to which different dimensions of managerial networking moderate the effects of other management activities on public sector performance in Dutch primary education (SRQ3). Specifically, we examine how the interaction between networking orientations and performance management affects school performance. Performance management is a cyclical process during which managers measure and use performance information to set organizational goals and make managerial decisions to achieve those goals (Moynihan, 2008; Hvidman & Andersen, 2013; Nielsen, 2013). We examine the effect of performance management on school performance in terms of schools' average student scores on a standardized test in 2010, 2012, and 2014. We focus on the interaction between performance management and three networking orientations. We hypothesize that performance management positively affects school performance (Hypothesis 4.1). Moreover, we argue that this positive effect is reinforced by outward- (Hypothesis 4.2), upward- (Hypothesis 4.3), and downward-oriented managerial networking (Hypothesis 4.4). The hypotheses are tested using a data set related to Dutch primary schools (n = 481; wave 2). Unfortunately, we could not include sideward-oriented managerial networking; due to space restrictions, the length of the managerial networking scale in the 2013 survey was reduced to fifteen items.

Studying these conditional effects enables us to better account for real world complexity—expanding our knowledge on the managerial networking-performance relationship by

further specifying existing models of public performance. In addition, by studying the effects of changes in the client population, red tape, and performance management, we contribute to the broader public management literature.

Another way to examine the interplay of several variables is to study indirect effects. The concept of managerial networking originates in the open system perspective (O'Toole & Meier, 2011). The core elements of organizations as open systems are input, throughput, and output (Katz & Kahn, 1978). For external resources, which are obtained through managerial networking, to have an effect on the organization's performance, public managers must manage inside the organization. However, existing studies of managerial networking and performance neglect to incorporate intermediary variables that precede organizational performance.

In Chapter 5, we address the question of the extent to which the effects of the different dimensions of managerial networking on public sector performance in Dutch primary education are mediated by intermediary variables that precede performance (SRQ4). We examine how managers facilitate the throughput of resources and demands, specifically, the primary production process, into performance. Compared to Chapters 2, 3, and 4, in Chapter 5 we use a narrower definition of the school organization and, with this choice, a narrower definition of internal management. In Chapter 5 we use formal membership of the school—instead of the school board—to delineate the boundaries of the organization. The reason is that the substantive focus of Chapter 5 lies on the primary production process of education—which is located within the school, specifically at the operational level at which teachers provide education for students. Key actors and stakeholders that are not part of the primary production process, such as the school board and peers, are therefore regarded as part of the school's 'external' environment. Hence, we examine the mediating role of downward networking on the relationships between upward, outward, and sideward networking and organizational performance. Organizational performance is operationalized in terms of schools' average student scores on a standardized test in 2009 and 2010. We hypothesize that outward- (Hypothesis 5.1), upward- (Hypothesis 5.2), and sideward-oriented managerial networking (Hypothesis 5.3) positively affect school performance through increased downward-oriented managerial networking. We test our conceptual framework using data related to 547 Dutch primary schools (wave 1). Studying the role of this intermediary variable will provide us with a stepwise understanding of the mechanisms that underlie the effect of managerial networking on public sector performance, which cannot be revealed by the direct-effect model.

Finally, Chapter 6 closes this dissertation. In this chapter, we discuss our main conclusions, the contributions and limitations of this dissertation, and suggestions and recommendations for future research.

1.6 Relevance for practice

Gaining additional insight into the managerial networking-performance relationship is also of practical relevance for managers and professionals in the public sector. Managerial networking consumes valuable time and requires effort. Hence, public managers must make choices about (a) the external organizations with which they develop and maintain network relations and (b) the amount of effort they put into a network contact in terms of contact frequency. Insights into the conditions under which specific managerial networking activities are beneficial can help public managers make strategic decisions about which networking activities to prioritize in certain situations.

This dissertation has practical relevance beyond its insights into managerial networking. First, the study of red tape in the context of Dutch primary education is highly relevant because over the last decade, the burden of red tape on Dutch primary schools was—and remains—high on the political agenda in the Netherlands. If red tape is indeed harmful for the performance of primary schools, then this finding should urge rule-makers to seriously evaluate the design of both new and existing rules.

Second, for several decades, the assumption that new public management (NPM) programs that originated in the private sector, such as performance management, are successful in the public sector has been used as the rationale for numerous public sector reforms (Hood, 1991; Moynihan, 2008; Van Dooren & Van de Walle, 2008; Boyne, 2010). For example, in the context of Dutch primary education, performance management is referred to as 'outcome-oriented teaching' or 'performance-driven teaching' (Dutch: opbrengstgericht werken). Within the framework of the Quality Agenda 2007 for primary education, the Dutch national government has developed several initiatives to encourage schools to employ 'performance-driven teaching.' By examining the effect of performance management, we gain insights into whether public managers' use of performance management tools is indeed legitimized.

2

Networking for environmental shocks

This chapter is co-authored by René Torenvlied and Agnes Akkerman. A slightly different version of this chapter has been published as: Van den Bekerom, Petra, René Torenvlied, & Agnes Akkerman. 2015. Managing All Quarters of the Compass? How Internally Oriented Managerial Networking Moderates the Impact of Environmental Turbulence on Organizational Performance. *The American Review of Public Administration* (Online First).

2.1 Introduction

The context in which public organizations operate is constantly changing (Aldrich, 2008; Emery & Trist, 1965). Changes often involve fluctuations in conditions, demands, and resources provided by external actors and external organizations (Pfeffer & Salancik, 2003). A core activity of public managers is to anticipate such fluctuations and shield their organization from changes that might hinder the organization in its efforts for goal attainment. Sometimes public managers are faced not with gradual changes but with turbulent events, such as sudden budget cuts, staff turn-over, or natural disasters (Hicklin, O'Toole, Meier, & Robinson, 2009; Meier & O'Toole, 2009; O'Toole & Meier, 2011). In the public management literature, irregular changes in an organization's environment are referred to as "environmental turbulence" (Boyne & Meier, 2009; Emery & Trist, 1965) or "environmental shocks" (O'Toole & Meier, 2011).

Boyne and Meier (2009) define environmental turbulence as an unpredictable change in the munificence (such as available economic resources) and complexity (such as characteristics of organization's clients) of an organization's environment. These turbulent changes challenge the organization's necessary stability, and consequently will negatively affect organizational performance (O'Toole & Meier, 1999, 2011). Indeed, empirical studies show that environmental turbulence is negatively associated with the performance of organizations (Boyne & Meier, 2009; Koberg & Ungson, 1987; Lin & Germain, 2003; Meier & O'Toole, 2009; O'Toole & Meier, 2011; Zinn, Mor, Feng, & Intrator, 2009).

Two sets of variables are assumed to help public organizations protect, insulate, and mitigate the negative impact of environmental turbulence. The first set of variables taps the organization's structural and procedural features that help the organization bolster its administrative system for externally produced uncertainty and instability (Fennell & Alexander, 1987; O'Toole & Meier, 2011). For Texas school districts, vertical and horizontal structural stability (Boyne & Meier, 2009) and teacher stability (Meier, O'Toole, & Hicklin, 2010) appear to moderate the negative effect of turbulence on school district performance (Boyne & Meier, 2009). Meier et al. (2010) report that teacher stability has a similar, moderating effect on the impact of hurricanes Katrina and Rita (the negative effect of school enrollment and days missed due to school district closure on Texas school district performances).

The second set of variables taps the management activities, which contribute to the organization's internal and external stabilizing features (Barnard, 1938; O'Toole & Meier, 2011; Simon, 1997). Specifically, internally oriented management activities aim to stabilize the organization's structural and procedural features (Miner, Amburgey, & Stearns, 1990; O'Toole & Meier, 2011). Externally oriented management activities—relations with external actors and organizations—aim to exploit the environment, reduce uncertainties, and buffer for environmental shocks (Geletkanycz, Brian, Boyd, & Finkelstein, 2001; Meier & O'Toole,

2003; O'Toole & Meier, 1999, 2011; Pfeffer & Salancik, 2003). Empirical studies on the moderating effects of management are limited to the Texas school districts. O'Toole and Meier (2010) and Meier et al. (2010) report that managerial capacity, which constitutes as a potential for managerial action, moderates the negative relation between turbulence and school performance. Meier and O'Toole (2009) also show that, while controlling for the negative effect of budget shocks, internally oriented managerial activities (cost-reductions in personnel or salaries) contribute to stability in performance. Ryu (2012) reports that externally oriented managerial networking, measured as "number of key environmental actors," moderates the negative effect of days missed due to school district closure.

In this chapter we build on the Texas school district studies by (a) simultaneously testing moderating effects of the actual internally and externally oriented managerial networking activities, rather than the scope of the emergency network, on the negative relation between environ- mental turbulence and public service performance in (b) a new research context: Dutch primary education. Moreover, in line with recent measurement studies on managerial networking (Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2014), we distinguish among several networking dimensions rather than using a one-dimensional activity measure (or networking index), often used by existing studies on managerial networking (for example, Meier & O'Toole, 2001; Meier & O'Toole, 2003; Walker, O'Toole, & Meier, 2007). The networking orientations are (a) "upward," (b) "downward," and (c) "outward" (Moore, 1995). We add a fourth networking orientation: (d) "sideward."

Empirically, we test our propositions using data obtained from a survey held in 2010 among Dutch school principals and combine these data with objective, independently measured constructs for turbulence and performance. We asked the school principals about their relations with 41 different types of organizations in the environment of their school, which enabled us to distinguish between four managerial networking orientations. The data set makes it possible to analyze effects of managerial networking using a much finer grid than existing studies that use a one-dimensional activity measure. Thus, we contribute to the state-of-the-art research in the field by testing existing and novel hypotheses in a new (European) research context.

2.2 Research context: Dutch primary education[1]

In 2009, there were 6,901 primary schools that are responsible for the education of more than 1.5 million school students in the ages between four and 12. Dutch primary schools vary with respect to their educational philosophy or denomination. This variation developed from the principle of "freedom of education," which is embodied in the Dutch Constitution. Almost 70% of all primary schools in the Netherlands are denominational schools.[2] Although parents are free to choose schools for their children, primary schools have some discretion to actively apply selection criteria, for example, the students' geographical distance and religious background. The other 30% are non-denominational schools. These schools are obliged to accept all children, regardless of their religious background.

In recent years, two simultaneous demographic trends have resulted in a decrease in the number of Dutch students in primary education: (a) the aging population and declining birth rate (cohort effect) and (b) regional population shrinkage caused by intra-country rural-to-urban migration (Nationaal Netwerk Bevolkingsdaling, 2013). The latter trend is, in turn, also responsible for the increase in the number of students in urban regions of the Netherlands. In addition, a decline or increase in the number of students can also be caused by inter-school migration of students; parents can decide to transfer their children to other schools. Inter-school migration can be triggered by the closing of the original school (due to insufficient number of students or reorganizations) or reputation damage (due to underperformance or incidents).

A lot of research within the field of public management focuses on American public schools (for example, the Texas school district studies). While American public schools are funded by federal funds, state funds, and local school district property taxes, Dutch primary schools are generally funded by national funds. Private schools, which rely on their own funds, are highly uncommon in the Netherlands, and therefore, almost all primary schools are "public" schools. There is no financial sponsoring of education from the private sector: All schools are entirely government- funded by a "block grant" from the Dutch Ministry of Education, Culture and Science. These grants are based primarily on school size: the number of students of the previous year who attended the primary school. Hence, schools are funded based on last year's enrollment, whereas U.S. schools funding is based on real-time enrollment. Block grants are, however, partly dependent on "student weights": Specific categories of students have their own weights, which are related to parental background characteristics, such as educational level or immigrant background (Ladd & Fiske, 2011).

1 An extensive discussion of the research context has been published in Torenvlied & Akkerman (2012).

2 Roughly 29% have a Roman Catholic background, 26% have a Protestant denomination, and 11% have another, not necessarily religious, denominational background (Islamic, Hindu, Jewish, or Waldorf school).

In the Netherlands, the executive oversight and administrative powers, such as the internal organization, the personnel and employment policies, and the financial management of the school—and ultimately the school's performance—are assigned to the school board (Turkenburg, 2008), whereas the chief operating officer of American schools is the superintendent. Although funding is based on schools' student characteristics, school boards have some discretion in their decision of how to distribute the grants among their schools. About 45% of all school boards in the Netherlands are responsible for a single school, and most school boards govern more than one school (sometimes even as many as than 60 schools). Despite their final accountability, most school boards delegate much authority and discretion to the school principal. In practice, most school principals establish the school's educational curriculum; supervise personnel processes; develop plans for pedagogical quality, student care, and quality control; and monitor student performance. School principals are the main representatives of the school in external contacts and therefore maintain relationships with organizations and actors in the school's environment, for example, the parent committee, the school board, local government, public libraries, youth care, the Inspectorate of Education, and test suppliers.

The Inspectorate of Education assesses all schools on the same final attainment levels. Most prominent is the standardized Cito test that provides information about both students' progress and the school's performance. Schools that fail to comply with the performance standards are subjected to an intensive supervision regime and an annual evaluation (which is made public). Schools that continue to fail ultimately risk losing their funding.

2.3 Theoretical framework

2.3.1 Environmental turbulence and performance

The organizational environment is often defined as "all elements that exist outside the boundary of the organization and have the potential to affect all or part of the organization" (Daft, 2010, p. 220). Scott (2003) distinguishes between the task environment (resource munificence, complexity, and dynamism) and the institutional environment (governmental policies and regulations). The elements of the environment are inherently dynamic, which may turn the environment "unstable." Environmental stability induces organizations to develop fixed sets of routines for dealing with environmental elements (Aldrich, 2008, p. 67). In a turbulent environment, externally induced changes are "produced by forces that are obscure to administrators and therefore difficult to predict or plan for" (Aldrich, 2008, p. 69). Hence, environmental turbulence can be interpreted as "environmental shocks," threatening the core of the organization (Meier & O'Toole, 2009). Environmental shocks negatively affect stabilizing forces within organizations, such as "structural stability" (the organization's formal hierarchy), "mission stability" (organizational goals), "procedural stability" (organizational

rules and operating procedures), "production or technology stability" (production tools), or "personnel stability" (O'Toole & Meier, 2011, p. 24). Hence, the hypothesis is that environmental shocks negatively affect organizational performance.

Empirical studies indeed show that environmental turbulence is negatively associated with the performance of public organizations. A study on nurses in a southeastern U.S. city (Salyer, 1995) reports that environmental turbulence—measured as the number of admissions relative to dis- charges from the unit in a 24-hr period—negatively affects the nurses' self-reported performance. A study of 205 state-owned enterprises in China (Lin & Germain, 2003) reports that managers' perceived "technological turbulence" negatively affects the self-reported growth performance of their firm relative to the industry. However, a study of school administrators of 88 schools in a northwest U.S. state (Koberg & Ungson, 1987) reports that the administrators' perceived unpredictable change in external circumstances are unrelated to their self-reported assessment of school performance.

Although these studies show some evidence for a negative relation between environmental turbulence and performance, they use self-reported measures, risking biases in estimates (Boyne & Meier, 2009; see also Boyd, Dess, & Rasheed, 1993). In recent years, scholars in public management therefore started to use objective measures for both turbulence and performance. A study of 10,901 U.S. nursing homes (Zinn et al., 2009), for example, shows that nursing homes confronted with a new reimbursement policy are more likely to experience performance failures—measured as termination from Medicare and Medicaid programs.

2.3.2 Environmental turbulence and school performance

In an educational setting, negative shocks generally involve political turbulence, burdensome administrative rules and regulations, lawsuits, budget cuts, or changes in student intake (Meier & O'Toole, 2009). Studies of Texas school districts report that budget shocks and student enrollment negatively affect student scores on standardized tests, or dropout rates (Boyne & Meier, 2009; Meier & O'Toole, 2009; O'Toole & Meier, 2011).

In the present chapter, we focus on environmental turbulence in the task environment of Dutch primary schools, which is, changes in the number of students. A change in the number of students may constrain (a) stability in the production of education and educational technologies, (b) stability in funding and school facilities, and (c) personnel stability (Dutch Inspectorate of Education, 2012). In the context of Dutch primary education, a decrease in the number of students directly translates into a reduction of school funding—with a delay of 1 year.[3] The reduction of funding turns especially problematic if, after a year, the number of students has increased again and the primary school is confronted with a severe funding gap.

3 For schools with less than 145 students, a drop in the number of students will be (partly) compensated by a special funding for small primary schools.

In the present context where personnel systems are not flexible, funding gaps put pressures on the quality and costs of education, which negatively affect school performance.

A change in the number of students also constrains the short-term management of education. Research shows that a decline in the number of students directly results in a higher spending per student on personnel and facilities (Berdowski, Berger, Eshuis, & Van Oploo, 2006). Due to the decline in students, fewer schoolteachers are needed. In the Netherlands, personnel management at primary schools is highly constrained by nation and sector-wide regulations. Compulsory redundancies are avoided as much as possible, and management is legally obliged to help redundant employees find a new job.[4] Consequently, employee surpluses may arise, which result in problematic personnel costs. Redundancy schemes also constrain managerial resources, at the expense of resources needed for improving or maintaining the quality of education. The reduction in students furthermore puts a burden on school facilities: Fewer classrooms are necessary, and fewer teaching materials are needed.[5] Hence, a high spending per student puts severe short-term pressures on the quality and costs of education, which negatively affect school performance. We expect that these short-term costs outweigh the short-term benefits of a (temporary) surplus caused by the 1-year funding delay.

The mechanisms triggered by a sudden reduction in the number of students do not, mutatis mutandis, translate into a positive effect of an increased number of students. A sudden increase in student enrollment, for example, will also constrain a school's organizational and managerial resources, due to the time lag in funding, the restricted capacity for hiring high-quality teachers, and the limited short-term prospects for expanding school facilities and teaching materials. Such strains on school resources and managerial capacity would come at the expense of resources needed for maintaining educational quality. Hence, we arrive at our first hypothesis:

Hypothesis 2.1: *Percentage change in the number of students negatively affects school performance.*

4 The seniority criterion is applied for the designation of workers who are regarded as redundant and are eligible for compulsory redundancy.

5 Studies on the effect of class size on students' achievements show mixed results (Fredriksson, Öckert, & Oosterbeek, 2012). For example, a study of Dobbelsteen, Levin, and Oosterbeek (2002) shows that students in large classes do not perform worse—and sometimes even perform better—than identical students in small classes. By contrast, Kreuger and Whitmore (2001) found that students who attend a small class in early grades are associated with an increased likelihood of taking a college-entrance and slightly higher test scores.

2.3.3 The moderating effect of managerial networking

In general, management involves the maintenance of relations with all kinds of individual and collective actors, such as employees, "suppliers, stakeholders, clients, alliance partners, regulatory agencies, or political institutions" (Torenvlied, et al., 2013, p. 252). A distinction can be made between internally and externally oriented managerial activities (O'Toole & Meier, 2011; O'Toole, Meier, & Nicholson-Crotty, 2005; Zhu & Johansen, 2013). Internally oriented networking activities aim to coordinate people and resources within the organization to accomplish public objectives (O'Toole et al., 2005). Such networking activities interact with environmental shocks, thus stabilizing the organization's primary process. Interactions with employees, for example, can help managers to further goal consensus (Floyd & Wooldridge, 1992), coordinate tasks, (re)allocate resources and personnel, and implement innovations (O'Toole et al., 2005; Zhu & Johansen, 2013). Externally oriented networking activities aim to reduce the impact of environmental shocks by compensating losses of resources or, instead, tap new opportunities in the environment. Goerdel (2006) distinguishes between proactive and reactive managerial networking. In the present study, we assume that both "types" can be beneficial to dealing with environmental turbulence.

Public managers have different managerial orientations (Moore, 1995;O'Toole et al., 2005). Recent studies on managerial networking, applying novel measurement techniques, indeed reveal the existence of several, stable dimensions of managerial networking activity (Torenvlied et al., 2013; Zhu et al., 2014). Building on these studies, the present chapter proposes four fundamental orientations of managerial networking activity. For internal management, we propose three networking orientations. The first two orientations are networking "upward" and networking "downward" (Moore, 1995; O'Toole et al., 2005). Whereas networking "upward" refers to meetings with, and reporting to, superiors (for example, political principals), networking "downward" refers to the management of internal processes and human resources. We propose networking "sideward" as an additional, third orientation of internal management, referring to networking activities with peers (or co-producers), necessary for the effective implementation of organizational strategies and programs. However, it can also be argued that networking sideward is a management activity that is on the crossroad of internal and external management. Each of the three networking orientations manifests in a particular intensity of networking with internal actors such as governance bodies (school board) in the upward orientation, employees (teachers) in the downward orientation, or stake- holders and client representatives (participatory council) in the sideward orientation.

Networking "downward" is the fourth fundamental managerial networking orientation (Moore, 1995;O'Toole et al., 2005). Managing outward refers to managers' interactions with various types of external actors and external organizations. Below, we develop hypotheses concerning the moderating effects of each of the managerial networking orientations in the Dutch educational context.

Networking upward. Networking upward translates into school principals' efforts to interact with, and report to, their school board—which is the main "principal" to the school. Principals' interactions with the school board could provide a school with additional resources and (legal) advice in situations turbulence, for example, to reallocate a surplus in (shortage of) teachers. Theoretically, we would expect that upward networking activities neutralize the negative impact of percentage change in the number of students on school performance. Empirical studies, however, show that school district superintendents' managing upward negatively affects school district performance (Meier, O'Toole, Boyne, & Walker, 2007; O'Toole et al., 2005). O'Toole et al. (2005) suggest that the principal-agent problem, resulting from a divergence in goals and risk preferences, often materializes in "over-control" (Bozeman, 1993). Intense networking with the school board may also reflect negative feedback by the board on a poorly performing school (Goerdel, 2006). If managing upward is associated with over-control and negative feedback, it might reinforce, rather than neutralize, the negative effect of environmental turbulence on school performance— further drawing away necessary resources from the primary process and destabilizing the school organization. This results in the second hypothesis:

Hypothesis 2.2: *School principals' intensity of upward-oriented managerial networking reinforces the negative effect of percentage change in the number of students on school.*

Networking downward. We define networking downward as principals' efforts to coordinate activities within the organization by interacting with schoolteachers and support staff. Such efforts involve team meetings, the delegation of authority, the development and implementation of protocols and guidelines, and HR-related activities. These activities help stabilize school performance in the face of external shocks. A proper delegation of responsibilities helps the school function well in a moment of turbulence. Involvement of the school team may bring flexibility in resources, new solutions to deal with the shock, and consensus among teachers and staff concerning strategic decisions. This leads us to the third hypothesis:

Hypothesis 2.3: *School principals' intensity of downward-oriented managerial networking attenuates the negative effect of percentage change in the number of students on school performance.*

Networking sideward. Education is a coproduced good, and school principals need cooperation from actors such as the school's participatory council (involving teachers and parents), the parents committee, or school principals from the same school board to properly implement their educational and organizational goals, strategies, and programs (Torenvlied et al., 2013).

Co-production with parents helps the school to buffer turbulence when environmental shocks occur, in terms of flexibility in parents' and students' demands, additional resources, and innovative solutions that help the school deal with the shock. This leads us to the fourth hypothesis:

Hypothesis 2.4: *School principals' intensity of sideward-oriented managerial networking attenuates the negative effect of percentage change in the number of students on school performance.*

Networking outward. Resource dependency theory specifies how organizations often lack resources needed to accomplish organizational goals (Fleishman, 2009; Pfeffer & Salancik, 2003). Managers' relations with external organizations aim to reduce uncertainties, generate external resources and support, and buffer for environmental shocks (Geletkanycz et al., 2001; O'Toole & Meier, 1999). In the field of education, such resources are the provision of funds, information about educational programs, peer advice, and the exchange of ideas (Meier & O'Toole, 2003). Outward managerial networking activities will moderate the negative effect of turbulence on performance by anticipation and by buffering for negative effects of environmental shocks through tapping necessary resources. This leads to our fifth hypothesis:

Hypothesis 2.5: *School principals' intensity of outward-oriented managerial networking attenuates the negative effect of student percentage change on school performance.*

2.4 Research design[6]

2.4.1 Data collection

To test our hypotheses, we use a data set of 546 school principals, after a listwise deletion of respondents who have missing values on the variables used in the analyses. The data set was constructed integrating three data sets of primary schools. The first data set contains information from a nation-wide survey we held among the principals of Dutch primary schools in January 2010, using an Internet survey. We asked the school principals, among others, for their managerial activities in the previous calendar year (where the scholastic year starts late August and ends early July). Principals of all 6,896 Dutch primary schools were invited by both mail and email to participate in the survey. Reminders were sent after two weeks. After six weeks, the response rate was 19.55% (n = 1,348). This rate is comparable with

6 Other recently published studies that use the same data set, but focused on different topics, have a somewhat comparable research design (Torenvlied & Akkerman, 2012; Van den Bekerom et al., 2015; 2016).

response rates reported by other studies of Dutch school principals, and is substantial given the work pressure on school principals and the prevalence of survey research in this sector.[7] The second data set is a data set from the Dutch Inspectorate of Education, which provides information about indicators of school performance, as well as a wide range of control variables. A third data set from the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency) provided information about the number of students and information about school boards in which Dutch primary schools are nested. The three data sets were matched by each school's unique identification number, assigned by the Dutch Ministry of Education, Culture, and Science—a four-digit code that allows the ministry to identify primary schools as separate educational units within school boards. Below, we discuss the construction of the different measures in the analysis.

2.4.2 Measures

School performance. The dependent variable in the present study is the school's average score of students on a standardized test for 2009 and 2010.[8] Dutch primary schools must use reliable and valid tests that meet the criteria of the Committee on Test Affairs, the Netherlands (Dutch: Commissie Testaangelegenheden Nederland). The most commonly used standardized test is the "Cito" test—in 2009, roughly 75% of all primary schools participated voluntarily in this test. This test is taken in the second half of the eighth and final grade of primary education. The Cito test score is based on three sub-tests: for language (100 questions), arithmetic (60 questions), and study competences (40 questions). Students' scores on these 200 questions are transformed on a scale between 501 and 550. In 1976, Cito chose this range to avoid confusion with intelligence tests, while retaining a proper range (50 points) to map the responses from 200 questions. In 2009, about 154,000 students participated in the test—the average score of students was 535.5 (Cito, 2009). Each year, the test is calibrated, evaluated, and adjusted.[9]

All primary schools are allowed to exempt specific, well-defined categories of students from the test: (a) students with severe language problems who have been living in the

7 For example, the web-based survey of the Dutch Education Council (2008, p. 31) had a response of 15.6%. A study that uses the same data set performed an elaborate non-response analysis shows that schools in the sample do not differ with respect to a large number of relevant characteristics, such as school size, location, denomination, or quality assessment by the Inspectorate of Education (Torenvlied & Akkerman, 2012, p. 466; also see Appendix).

8 Rich assessment data from inspector reports are not available, except for underperforming schools in a strict regime of oversight by the Inspectorate of Education.

9 In the transformation, several steps are taken (Van Boxtel, Engelen, & De Wijs, 2011). Because each year new items are used, item-response models are applied to identify items that fit poorly on the scale. The item-difficulty is further calibrated using samples of pre-tests using tests from previous years. Comparability of test scores across years is guaranteed by estimating a normal curve equivalent. The 501 to 550 scale is devised as a linear equivalence transformation using the distribution of the earlier year. The standard error of the equivalence procedure is estimated by statistically comparing the variance in student scores for different groups of schools, using different years as a baseline. These tests show that the procedure is robust for different equivalence procedures.

Netherlands for a period shorter than 4 years, and (b) students with an indication for special secondary education, and sometimes for lower levels of vocational secondary education. Thus, our data do not include test scores of students referred to special education or "second language" students.

Despite the room for discretion, students' average Cito test scores (corrected for student characteristics) are considered to be an authoritative indicator for school performance by the Dutch Inspectorate of Education—and by most teachers and parents as well. As of 2013, the average Cito test scores of schools are freely accessible on the Internet. However, in 2010, the use of these data for analysis required the school's explicit consent. Therefore, we asked the school principal in the web-based survey to indicate whether the principal agreed on the use of the average Cito score data. About 75% of the school principals who responded to the survey gave permission to use the average Cito score data.[10]

Environmental turbulence. To measure environmental turbulence, we use the data from DUO and calculated the percentage of change in the number of students. This is the absolute value of the decrease or increase in the number of students. For the year 2009, we use the absolute value of the percentage change in students between 2008 and 2009, and for the year 2010, we use the absolute value of the percentage change in students between 2009 and 2010.[11] For 11 schools in the data set, the change exceeded 40% of the students (ranging between 41% and 137%). These schools are likely subject to changes not caused by environmental turbulence but rather by strategic choices, such as the merger of schools. These schools were excluded from the analyses.

Networking orientations. We follow O'Toole and Meier's (2011) measurement of managerial networking as captured by the frequency of relations with actors and organizations in the environment of the organization.[12] We approached a number of key informants from the educational domain, such as school principals, school-board members, members from the

10 On the basis of the consent rate of 75% of all school principals in our survey—combined with the percentage of schools that use the Cito score (75%)—we may expect that we have 56.25% of our cases valid for analysis. On the basis of 1,348 schools in our data set, this percentage combines to 758 valid cases of performance. In the 2009 data set, we have 718 valid cases for performance. Thus, the avail- able cases roughly are what we would expect on the basis of the national data. The number of valid cases reduces to $N = 546$ because of missing cases in the various independent variables and controls.

11 In their study on public management and performance after hurricane Katrina, Meier, O'Toole, and Hicklin (2010) also used the percentage of student influx as a measures of environmental turbulence, as did Boyne and Meier (2009).

12 This assumption is strong, because interaction frequency does not fully capture the richness of network ties that may exist between organizations, nor does the interaction frequency provide information about who initiated the contact (Torenvlied & Akkerman, 2012). The Texas school data reveal that taking the initiative in networking and managerial networking activity are highly correlated variables (cf. Goerdel, 2006).

Primary Education Council, and the Dutch Inspector- ate for Education. These informants provided us with a list of potential types of organizations: (a) organizations at different levels of the educational system (for example, the national, regional, local, and school-board levels) and (b) organizations with different functions in the educational system as broadly described above in the research context. This procedure resulted in a list of 41 different types of organizations and actors in the environment of the school. We asked the school principals about their frequency of interaction with each of these organizations, using the categories "daily," "weekly," "monthly," "several times per year," "yearly," and "never." Thus, our research design replicates previous designs for the study of managerial networking (Meier & O'Toole, 2003; O'Toole & Meier, 2011) but uses a much finer grid for measuring support than has been applied in previous research. Each of the four networking orientations is tapped by one or more networking scales. These scales are based on theoretical expectations about scale composition and are analyzed with non-parametric item-response models to test for internal consistency (Torenvlied et al., 2013; Zhu et al., 2014). For each of the networking variables composed of multiple organizations, we computed a sum scale, which we standardized with respect to the number of items in the scale.[13] All scales have a homogeneity H between 0.30 and 0.50, that is acceptable (Van Schuur, 2003). Below, we discuss the scales for each of the networking orientations in more detail.

"Networking upward" is conceptualized as the self-reported interaction frequency of the school principal with the school board. To measure "networking downward" we use the variable team involvement. The items tap the school principals' interaction frequency with the staff concerning several issues: (a) "school identity and external communication," (b) "school housing and maintenance," (c) "financial affairs," (d) "personnel and employment policy," (e) "quality of education," (f) "student results and performance monitoring," (g) "student care," (h) "educational quality," (i) "external relations," and (j) "scheduling and other practicalities."[14] The same response options that are used in the conventional measurement of managerial networking were used for the responses. The items form a scale with high internal consistency (H = 0.40).

"Networking sideward" is conceptualized as managerial networking for co-production. The contact frequency items are (a) "the parents committee," (b) "the participatory council," and (c) "principals of schools that are part of your school board." These items form a co-production networking scale with an acceptable homogeneity (H = 0.38).

13 The use of standardized sum scales allows us to interpret effect sizes of managerial networking activity in a straightforward way (as they represent average interaction frequencies).

14 These aspects were also derived on the basis of in-depth interviews with school principals, board members, and representatives from the Inspectorate of Education.

"Networking outward" is conceptualized as managerial networking with a number of organizations external to the primary school or school board. We asked the school principals for their interaction frequency with organizations and actors that represent national government actors, local government actors, and interest organizations in the labor relations domain (Torenvlied & Akkerman, 2012). Local government actors and organizations are (a) "members of city council," who are the representatives in the local political arena, (b) "aldermen," who are the chief administrators in the local government, and (c) the "municipal department of education," which is the main local government department responsible for implementing education policies in the local domain. The items on local networking activity form together a strong scale (H = 0.51).

National government actors and organizations are (a) the "DUO," which is the semi-autonomous government agency responsible for budgeting and finance, (b) the Dutch "Ministry of Education, Culture and Science," which is the national government department responsible for formulating educational policies and programs, (c) "test suppliers," which are corporations that develop standardized tests for primary education, and (d) the autonomous "Inspectorate of Education," which is responsible for monitoring school performance and auditing the schools on a wide variety of performance indicators. The four networking frequency items form an intermediate strong "youth care" scale (H = 0.46).

Interest organizations in the labor relations domain are (a) "labor unions," which are the labor unions for teaching and support staff, (b) "employer organizations," which are organizations that represent the interests of school principals, and (c) "the Primary Education Council," which is the employers' organization for school boards in primary education. The items on interest organization networking form together an intermediate strong scale (H = 0.42).

Controls. We control for a number of variables that tap differences in the student population, institutional school characteristics, principal characteristics, and municipal characteristics. At the year level (which is "Level 1" in the analyses), we control for the percentage disadvantaged students and school size for t = 2009 and t = 2010. The variable percentage disadvantaged students taps the percentage of students who carry a "student weight," indicating that the student needs additional support and resources.[15] We control for this variable not only because it may affect the school Cito test scores but also for their over- or underrepresentation in the

15 The percentage of disadvantaged students is based on the so-called "student weights." Students are assigned specific weights if both parents have only attended elementary school (0.25); they live in a foster home (0.4); both parents work in a circus or fair (0.7); one or both parents live at a trailer park (0.7); they have a non-Dutch cultural background; or if the father or mother (caretaker) has finished a lower professional education at most; or if the highest-earning parent is employed in a profession in which she or he does physical or hand labor, or is unemployed (0.9 if one of these conditions is satisfied). The numbers in parentheses are the weights used to calculate the additional funding for these disadvantaged students.

event of a large change in the number of students. We also control for school size because for larger schools a change in the absolute number of students translates into smaller percentages. In other words, larger schools are better able to buffer student changes.

We control for several institutional characteristics of the school. First, we control for the size of the school board, which is measured as the number of schools that are governed by the school board. The variable denomination measures whether a school is a non-denominational school (1) or a denominational school (0). We furthermore include two measures that control for confounding effects that may arise from differences between school principals: their work engagement and experience. To measure work engagement, we use the "Utrecht Work Engagement Scale-9" (UWES-9; Schaufeli, Bakker, & Salanova, 2006). Nine items capture vigor, meaningfulness, enthusiasm, and well-being, among others. The items form a scale with high internal consistency (H = 0.65). Experience is captured by the number of years that the school principal has worked as head of this specific school Finally, we control for non-turbulence, that is, predictable changes in the number of students. For example, a decline or increase in birth rate in the municipality or neighborhood produces predictable "cohort" effects. To control for such predictable effects, we included the variable population growth per 1,000 inhabitants between 2007 and 2011 for the municipality in which the school is located. This variable is created by the National Institute for Public Health and the Environment (Dutch: Het Rijksinstituut voor Volksgezondheid en Milieu) and combines "natural increase" (excess of births over deaths) with "net migration" (excess of arrivals over departures).[16] The variable consists of three categories: (a) strong increase: population growth larger than 5, (b) strong decrease: population growth smaller than −5, and (c) no or small change: population growth between −5 and 5.

Table 2.1 provides summaries of the descriptive statistics and correlations between the explanatory variables in the analysis. The results show that the percentage of disadvantaged students is moderately correlated with the Cito test scores. Other weak and moderate correlations exist between the managerial networking orientations, which shows that the networking scales indeed measure separate aspects of managers' networking behavior.

16 Because there were no data set available, we harvested these data from the RIVM website in July 2014.

Table 2.1 Descriptive statistics and correlations for all variables in the analyses (n = 546)

	Variable	Mean	Std. dev.	Range	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1)	Average Cito test scores	535.17	4.10	518.10 - 545.20	1,00													
(2)	% Change in number of students	4.78	4.48	.00 - 37.77	-.10*	1,00												
(3)	Number of students	236.31	136.63	27.00 - 1152.00	-.54*	.07*	1,00											
(4)	% Disadvantaged students	13.74	14.75	.00 - 8.00	.16*	-.17*	-.14*	1,00										
(5)	School board contact	3.81	1.34	1.00 - 6.00	.01	.03*	.05*	.07*	1,00									
(6)	Team involvement	2.41	.55	1.20 - 4.20	.06*	.04*	-.06*	.05*	.18*	1,00								
(7)	Co-production networking	4.06	.66	1.33 - 6.00	-.06*	.07*	.03*	-.03*	.08*	.23*	1,00							
(8)	Local government networking	2.14	.72	1.00 - 4.67	-.02	.01	.07*	.04*	.20*	.19*	.16*	1,00						
(9)	National government networking	2.45	.60	1.25 - 4.50	.01	.00	-.04*	.05*	.14*	.24*	.12*	.25*	1,00					
(10)	Interest group networking	1.94	.77	1.00 - 4.67	-.01	-.04*	-.07*	.03*	.18*	.14*	.05*	.25*	.48*	1,00				
(11)	Work engagement	4.24	.85	1.44 - 6.00	.02*	-.08*	.06*	.01	.09*	.02	.07*	.07*	.02	.14*	1,00			
(12)	Work experience	8.15	7.92	.00 - 4.50	.09*	-.06*	-.09*	.14*	-.04*	.02	.01	.10*	.03*	-.05*	-.09*	1,00		
(13)	Number of schools per board	15.97	12.48	1.00 - 64.00	-.14*	.05*	.18*	.07*	.13*	.02	.21*	-.01	-.04*	-.10*	.10*	-.03*	1,00	
(14)	Denomination (non-denominational = 1)	.28	.45	.00 - 1.00	-.12*	.07*	.13*	-.04*	-.06*	.06*	.21*	.09*	.00	-.13*	-.04*	.01	.14*	1,00
(15)	Strong increase population	.33	.47	.00 - 1.00	-.07*	.03*	.13*	.22*	.12*	-.02	.02	-.07*	-.02	.04*	.01	-.07*	.11*	-.02
(16)	Strong decrease population	.03	.16	.00 - 1.00	.01	.03*	-.03*	-.09*	-.04*	-.01	.00	-.04*	.00	.03*	-.03	.11*	.05*	-.02
(17)	Small change population	.65	.48	.00 - 1.00	.07*	-.04*	-.12*	-.18*	-.11*	.03	-.02	.08*	.02	-.05*	.00	.04*	-.12*	.02

Significance levels: *$p < .05$

2.5 Results

The study design nests the average Cito test scores of schools and the percentage change in number of students for two years (2009 and 2010) within schools. We apply a multilevel regression analysis to test our hypotheses.[17] Multilevel regression analysis takes into account that observations at the lowest level (year level) are mutually dependent. Compared to ordinary least squares (OLS) regression analysis, multilevel models have more power and produce less biased standard errors (Hox, 2010), also compared to OLS regression analysis correcting for clustered standard errors (Cheah, 2009).

To test for the moderating effects of managerial networking orientations on the relation between percentage change in number of students and school performance, we constructed six variables interacting networking orientation with change in students. These interaction variables are, necessarily, highly correlated. Therefore, we test the interaction effect of each managerial networking variable in a separate model. To evaluate the explanatory power of the variables, we calculate the percentage reduction in variance within schools and between schools after adding the predictor variables to the new model (Raudenbush & Bryk, 2002). We use model deviance to compare the relative fit of two competing models (Hox, 2010).

2.5.1 Effect of percentage change in the number of students on performance

Table 2.2 presents the results of a multilevel analysis testing whether percentage change in the number of students negatively affects school performance. We first fit the empty model (Model 0), which contains only an intercept term and variance estimates at "Level 1," the year level (σ^2_e), and at "Level 2," the school level (σ^2_{u0}).[18] These estimates provide insights into how much variance in Cito test scores we observe within schools over time and how much variance we observe between schools. The intraclass correlation coefficient (ICC), which is the proportion of variance at the school level, is estimated as p = 9.58 / (9.59 + 7.11) ≈ .57. Hence, 57% of the variance in average Cito test scores can be attributed to differences between schools. The remaining 43% can be attributed to differences within schools over time.[19]

17 According to Gelman and Hill (2007), two observations, or occasions, per group is enough to fit a multilevel model.

18 For repeated measurement data (panel designs), the cases at the time level are sampled following an ordered scheme, which results in an overestimation of variance at the time level and an underestimation of variance at the individual level (for details, see Hox, 2010). To produce more realistic variance estimations for repeated measurement data, we add a time variable (year = 2010) to the empty model.

19 Because schools are also nested within school boards and municipalities, we also calculated the ICC at the school board level and the municipal level. We find that about 43% of the variance of Cito test score is attributed to differences within schools over time, 38% is attributed by differences between schools, 13% of the variance is explained by differences between boards, and 6% is explained by differences between municipalities.

Table 2.2 Multilevel regression analysis of average Cito test scores

	Model 0 b/se	Model 1 b/se	Model 2 b/se
Year level (Level 1)			
% Change in number of students			-.039+
			(.023)
% Disadvantaged students		-.141***	-.141***
		(.009)	(.009)
Number of students		.003**	.002**
		(.001)	(.001)
Year = 2010	.479**	.451**	.461**
	(.162)	(.164)	(.164)
School level (Level 2)			
School board contact		.116	.120
		(.095)	(.095)
Co-production networking		-.159	-.147
		(.196)	(.196)
Team involvement		.237	.249
		(.235)	(.235)
Local government networking		.122	.125
		(.183)	(.183)
National government networking		-.023	-.020
		(.237)	(.236)
Interest group networking		-.405*	-.414*
		(.186)	(.185)
Work engagement		.317*	.298*
		(.144)	(.144)
Experience		.014	.013
		(.016)	(.016)
Number of schools board		-.020*	-.020+
		(.010)	(.010)
Denomination†		-.458	-.441
		(.280)	(.279)
Strong increase population growth‡		-.125	-.103
		(.271)	(.271)
Strong decrease population growth‡		.064	.094
		(.754)	(.753)
Constant	534.927***	535.115***	535.097***
	(.175)	(.190)	(.190)

Table 2.2 Continued

	Model 0 b/se	Model 1 b/se	Model 2 b/se
σ^2_e (Level 1 – Year)	7.108	7.213	7.205
	(.433)	(.440)	(.439)
σ^2_{u0} (Level 2 – School)	9.577	4.163	4.133
	(.826)	(.522)	(.520)
N Level 1	1,083	1,083	1,083
N Level 2	546	546	546
Deviance	5,906.88	5,629.51	5,626.57
Likelihood-ratio test		277.37***	2.93+

Note. All explanatory variables except dichotomous variables are grand-mean centered; likelyhood-ratio test is used to compare fit of model to preceding model.
Significance levels: $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.
[a]Reference category is denominational schools.[b]Reference category is small change population growth

In Model 1, all control variables are added. The control variables, percentage of disadvantaged students and number of students, significantly explain differences between schools in average Cito test scores. The principal's interest group networking activity is negatively and significantly associated with the school's average Cito test score. Work engagement has a significant and positive effect on Cito test scores, and the number of schools per board has a negative effect.[20]

Model 2 adds the environmental shock variable percentage change in the number of students. The effect of percentage change in the number of students on Cito test scores is significant and negative, as predicted by Hypothesis 2.1.[21] In terms of effect size, the effect of student change on Cito test scores is modest: 0.04 / (545.20 − 518.10) × 100 ≈ 0.14%. Hence, a change of 1% in student change reduces the average Cito test scores by 0.14%. Still, for the schools with the highest level of student change (40% change), this implies that their Cito test scores are expected to drop by 5.6%. The percentage reduction in variance at Level 1 is only 0.1, which shows that residual variance within schools decreases only slightly after adding

20 We also find that inclusion of these variables make the residual variance at Level 1 increase. This is not an uncommon phenomenon in models with Level 1 variables without group variation (Wang, Xie, & Fisher, 2011).

21 In line with Texas school district studies, we also tested an autoregressive model by including the variable Citolagged average Cito test scores (for 2008). The autoregressive term has a strongly significant coefficient, which shows that past performance has a strong effect. As a result, the significant effect of percentage change in the number of students disappears. The main reason is that, in general, including a lagged dependent variables suppresses the explanatory power of other independent variables (Achen, 2000). Because past performance is also likely to influence turbulence (as parents choose to take their children out of bad schools), we modeled the two-way effect of past performance using Baron and Kenny's (1986) framework for mediation while controlling for all other variables. We find that past performance does not significantly affect turbulence, and the Sobel test was not significant. Hence, there is no mediating effect of turbulence.

student change. The residual variance at the school level decreases by 0.7%. The model fit improves significantly by adding the shock variable.

2.5.2 Moderating effects of managerial networking

The second part of our theory specifies the moderating effects of different managerial networking orientations on the negative association between environmental turbulence and school performance. Hypothesis 2.2 predicts that school principals' intensity of upward-oriented managerial networking reinforces the negative effect of percentage change in number of students on average Cito test scores. The other hypotheses predict that the intensity of downward (Hypothesis 2.3), sideward (Hypothesis 2.4), and outward-oriented managerial networking (Hypothesis 2.5) attenuate the negative effect of percentage change in number of students on average Cito test scores. Table 2.3 shows the abbreviated results of a series of multilevel models testing the hypotheses.

Model 1 in Table 2.3 adds the interaction variable of school board contact and percentage change in the number of students. The estimates show that school board contact does not significantly reinforce the negative effect of student change on Cito test scores. Hence, the data do not corroborate the "networking upward" Hypothesis 2.2. Model fit compared to Model 2 in Table 2.2 does not improve significantly.

Table 2.3 Multilevel regression analysis of average Cito test scores: moderating effects of managerial networking (abbreviated: controls not presented)

	Model 1 b/se	**Model 2 b/se**	**Model 3 b/se**	**Model 4 b/se**	**Model 5 b/se**	**Model 6 b/se**
% Change in number of students	-.038+	-.044+	-.045+	-.040+	-.038+	-.042+
	(.023)	(.023)	(.023)	(.023)	(.023)	(.023)
School board contact	.119	.112	.098	.123	.121	.120
	(.095)	(.095)	(.095)	(.095)	(.095)	(.095)
Co-production networking	.116	.149	.127	.127	.132	.114
	(.183)	(.182)	(.182)	(.182)	(.183)	(.183)
Team involvement	-.029	-.006	-.024	-.007	-.021	-.019
	(.236)	(.235)	(.235)	(.236)	(.236)	(.236)
Local government networking	-.135	-.172	-.086	-.157	-.153	-.142
	(.196)	(.195)	(.197)	(.196)	(.196)	(.196)
National government networking	-.410*	-.416*	-.406*	-.412*	-.414*	-.415*
	(.185)	(.185)	(.185)	(.185)	(.185)	(.185)
Interest group networking	.255	.234	.209	.258	.253	.245
	(.235)	(.234)	(.235)	(.235)	(.235)	(.235)

Table 2.3 Continued

	Model 1 b/se	**Model 2 b/se**	**Model 3 b/se**	**Model 4 b/se**	**Model 5 b/se**	**Model 6 b/se**
% Change in number of students * school board contact	-.012					
	(.018)					
% Change in number of students * team involvement		.093*				
		(.041)				
% Change in number of students * co-production networking			.083*			
			(.036)			
% Change in number of students * local government networking				.040		
				(.033)		
% Change in number of students * national government networking					.027	
					(.038)	
% Change in number of students * interest group networking						-.038
						(.028)
Constant	535.106***	535.075***	535.071***	535.092***	535.094***	535.100***
	(.190)	(.190)	(.190)	(.190)	(.190)	(.190)
σ^2_e (Level 1 – Year)	7.201	7.187	7.200	7.205	7.211	7.171
	(.439)	(.438)	(.440)	(.440)	(.440)	(.438)
σ^2_{u0} (Level 2 – School)	4.132	4.089	4.069	4.112	4.120	4.161
	(.520)	(.517)	(.517)	(.519)	(.520)	(.520)
N Level 1	1,083	1,083	1,083	1,083	1,083	1,083
N Level 2	546	546	546	546	546	546
Deviance	5,626.09	5,621.46	5,621.47	5,625.13	5,626.07	5,624.80
Likelihood-ratio test	.49	5.11*	5.10*	1.45	.50	1.78

Note. All equations control for percentage disadvantaged students, number of students, yearly dummy variable, work engagement, experience, number of schools per board, denomination (non-denominational = 1) and the population growth dummy variables; all explanatory variables except dichotomous variables are grand-mean centered; likelyhood-ratio test is used to compare fit of model to Model 2 in Table 2.
Significance levels: $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

The estimates in Model 2 show that team involvement attenuates the effect of student change on Cito test scores, which corroborates the "networking downward" Hypothesis 2.3. The unique effect of student change (−0.04) can be interpreted as the effect of student change on Cito test scores when team involvement is average, which is 2.41 (when data are not centered). The overall effect of student change on Cito test scores becomes −0.04 + 0.09

× team involvement. For school principals with the highest level of team involvement, 4.20 in our data, this implies that the effect of student change is $-0.04 + 0.09 \times (4.20-2.41) \approx 0.12$. Hence, principals with highest levels of team involvement are able to attenuate the negative impact of student change on the performance of their school. In comparison with Model 2 in Table 2, the residual variance decreases with 0.2% at the year level, and with 1.0% at the school level. Hence, team involvement in interaction with student change explains 1.0% of the variance between schools. The model fit improves significantly in comparison to Model 2 in Table 2.

Model 3 presents the effect of the co-production networking interaction variable. Co-production networking moderates the negative effect of percentage change in students on average Cito test scores, as predicted in the "networking sideward" Hypothesis 2.4. The negative effect of student change diminishes for school principals with highest levels of co-production networking ($-0.04 + 0.08 \times (6.00 - 4.06) \approx 0.12$). In other words, principals with highest levels of co-production networking are also able to temper the negative effect of student change. Residual variance within schools does not change, but between schools the residual variance drops by 1.5%. The model fit does improve significantly in comparison to Model 2 in Table 2.

Hypothesis 2.5 is tested in Models 4 to 6 for the three scales of outward networking. The three models reveal that there is no moderating effect of local-, national government-, or interest group networking on the negative association between change in number of students and Cito test scores.[22]

2.6 Conclusion and discussion

Based on the analyses, we can draw a number of conclusions. In the first place, we provide evidence for the hypothesis that environmental shocks negatively affect organizational performance. This replicates the results of previous studies by Boyne and Meier (2009), Meier

22 We examined the robustness of findings in the "Results" section for differences in the shock: whether a decline or an increase in the number of students makes a difference in the effect on school performance. We performed a series of regression analyses to separately test the effect of positive and negative changes in the number of students. We find that—independently of one another—both "directions" have a negative, not significant, effect on school performance. We also examined whether the moderating effects of team involvement and co-production networking are different for a positive or negative change in the number of students. We included a three-way interaction term for team involvement/co-production networking, the percentage change in the number of students variable, and a dummy variable for decrease in the number of students. We find that the reinforcing effects of both team involvement and co-production networking are significantly stronger for schools experiencing a decrease in number of students than for schools experiencing an increase in the number of students. Finally, to reduce potential bias produced by principals at a very early stage in their career, we confined the analysis to principals with at least 6 months of experience in their function. We find that results are comparable with results without this limitation.

and O'Toole (2009), O'Toole and Meier (2011), and Zinn et al. (2009) in a new context. In the second place, the data provide evidence for hypotheses about the attenuating effects of school principals' downward-oriented networking and sideward-oriented networking on the negative effect of external shocks on organizational performance. Internally oriented networking activities actually neutralize negative effects of environmental shocks. Finally, the data do not provide evidence for the existence of a reinforcing effect of school principals' upward-oriented networking or an attenuating effect of outward-oriented networking on the negative effect of external shocks on organizational performance.

The implication of the present study is that, in the context of primary schools in the Netherlands, the negative impact of turbulence and shocks in the school's environment is moderated by internally oriented networking activities, rather than externally oriented networking activities Environmental shocks, thus, interfere with organizational parameters that affect the internal stability of the school organization and not exclusively in interaction with environmental stability—which is a core assumption of the model of public management developed by O'Toole and Meier (2011). In the context of primary education in the Netherlands, it is not external networking that moderates the impact of external shocks on organizational performance but rather internal networking with teachers and co-producers. In situations of turbulence, Dutch primary school principals rely on their downward-oriented and sideward-oriented networking relations. The present research could be extended to other contexts or to conceptualizations of environmental shocks other than percentage change in students. Future research should try to reveal the mediating effects of environmental shocks on performance through specific internally stabilizing forces, such as structural-, personnel, or production stability (O'Toole & Meier, 2011). Future research should also further probe in the consequences of networking as a multidimensional concept. The present study clearly shows that a multidimensional approach to networking has improved our under- standing of how public managers' networking activities with specific types of actors help moderate environmental shocks, and ultimately, how they affect organizational performance. The present study did not distinguish between proactive and reactive networking (Goerdel, 2006), and an intriguing question is whether proactive managers are better able to absorb negative effects of environmental turbulence than do managers who have a more reactive networking approach.

Finally, the results have practical implications for public managers, more specifically for managers in education. The present study clearly shows that there are limits to effective networking when an environmental shock hits a school. A dominant focus on externally oriented networking may drag away resources from internally oriented networking, essential to buffer internal organizational processes. Externally oriented relations may buffer an organization for future events. But once the storm breaks out, public managers are wise to fix their organizational compass on an internal orientation.

3

Networking for environmental constraints

This chapter is co-authored by René Torenvlied and Agnes Akkerman. A slightly different version of this chapter has been published as: Van den Bekerom, P., Torenvlied, R., Akkerman, A. (2016). Constrained by red tape: how managerial networking moderates the effects of red tape on public service performance. *The American Review of Public Administration (Online First)*

3.1 Introduction

The relation between public organizations and their environment is at the heart of public management research (Boyne, Meier, O'Toole, & Walker, 2006; Rainey, 2009; Walker, Boyne, & Brewer, 2010). Organizations face many challenges originating from their environment. These challenges are induced by dynamic, often highly complex, processes that constrain the organization. Key examples are shocks in client-demands for services, changing government policies, or technological developments and innovations. A core competence of managers is their ability to effectively manage their organization in the face of environmental shocks and constraints (Aldrich, 2008; Emery & Trist, 1965; Pfeffer & Salancik, 2003).

The organizational environment is commonly defined as "all elements that exist outside the boundary of the organization and have the potential to affect all or part of the organization" (Daft 2010, p. 220). Environmental challenges manifest themselves both as constraints on the proper functioning of the organization, as well as opportunities (O'Toole & Meier, 2011; Pfeffer & Salancik, 2003). Moreover, environmental challenges can be relatively predictable, but also erratic (O'Toole & Meier, 2011).

Extant public management studies examining the management of environmental challenges predominantly concentrate on the management of the erratic dimension of environmental challenges, that is, environmental shocks. Shocks, such as sudden budget cuts, abrupt changes in service demand, or immigration in local governments, negatively affect the performance of public organizations (for example, Andrews, Boyne, O'Toole, Meier, & Walker, 2013; Boyne & Meier, 2009; Meier & O'Toole, 2009; Meier, O'Toole, & Hicklin, 2010; Van den Bekerom, Torenvlied, & Akkerman, 2015; Zinn, Mor, Feng, & Intrator, 2009). Public management studies convincingly show that environmental shocks can be successfully managed in order to mitigate their harmful effects on organizational performance (for example, Andrews et al., 2013; Meier & O'Toole, 2009; Van den Bekerom et al., 2015).

Whereas there is strong evidence that environmental shocks can be effectively managed, much less is known about more predictable environmental constraints that likewise challenge the organization's functioning. Examples of such constraints are legal requirements, social requirements and -expectations, or technological developments. Analytically, constraints are by definition "not predestined and irreversible," and therefore potentially removable (Pfeffer & Salancik, 2003, p. 18). Environmental constraints contrast with environmental shocks, which are "produced by forces that are obscure to administrators and therefore difficult to predict or plan for" (Aldrich, 2008, p. 69). Consequently, it is likely that constraints and shocks each require specific managerial strategies. The stability and predictability associated with constraints induce public managers to develop stable routines (Aldrich, 2008, p. 67). By contrast, the unpredictability of environmental shocks induces public managers to apply more ad hoc managerial strategies (Comfort, 1994).

The aim of the this chapter is to study how managerial networking moderates the (negative) effect of predictable environmental constraints on organizational performance. Specifically, we study the extent to which burdensome external rules, regulations, and procedures hinder the organization's performance. External organizations impose rules, regulations, and procedures on public organizations. Often these rule-based restrictions are beneficial to public service performance, that is, "green tape" (DeHart-Davis, 2009). Such rules, for example, ensure worker safety, prevent nepotism and corruption, or stress ethical norms. However, rules can also be burdensome and unnecessary, impeding organizational performance—the definition of external "red tape" (Bozeman, 1993). Thus, red tape should be viewed as a pathological aspect of formalization (Bozeman & Scott, 1992). Although it is widely expected that red tape is harmful for organizational performance (Bozeman, 1993; 2000; Gore, 1993; Kaufman, 1977), only a limited number of studies empirically tested this hypothesis (see Brewer & Walker, 2010; Pandey & Moynihan, 2006; Pandey, Coursey, & Moynihan, 2007; Tummers, Weske, Bouwman, & Grimmelikhuijsen, 2015; Walker & Brewer, 2009a; Walker & Brewer, 2009b). These studies support the expected negative effect of perceived red tape on performance. Brewer and Walker (2010), however, show that perceptions of various types of red tape may have different effects on different aspects of public service performance.

Perceptions of red tape are expected to decrease due to feedback relations, that is, networking relations between the focal organization and the external organizations that impose rules and regulation (Bozeman, 2000; Brewer & Walker, 2010). There is, indeed, empirical evidence suggesting that managerial networking is associated with lower levels of perceived red tape (Torenvlied & Akkerman, 2012; Walker & Brewer, 2009a).

Whether managerial networking attenuates the negative effect of red tape on organizational performance has not been tested. The present study examines this relation. We contribute to the extant research in public management by studying the moderating effects of managerial networking on the negative relation between environmental constraints—that is, perceived red tape—on organizational performance. We examine two types of red tape (personnel red tape and general external red tape; Pandey & Scott, 2002) and four different orientations of managerial networking (Moore, 1995; O'Toole, Meier, & Nicholson-Crotty, 2005; Van den Bekerom et al., 2015).

We test our hypotheses using a data set collected in a field survey held in 2010 among Dutch public school principals. These data are combined with objective school performance data, which were measured independently from the survey. The study of red tape in the context of Dutch primary education is highly relevant, because, over the last decade, the burden of red tape on Dutch primary schools was high on the political agenda in the Netherlands. Dutch primary schools are all constrained by a relatively homogeneous framework of national and local laws, procedures, rules, and regulations—as well as national-level collective bargaining

agreements between the Minister of Education and the unions. Although there is no systematic variation between primary schools in the sources of red tape, Dutch primary school principals do differ in their perceptions of red tape (Torenvlied & Akkerman, 2012). Moreover, schools differ in context, for example in the proportion of disadvantaged students. Context may affect their demand for specialized programs, inducing specific rules, procedures, and regulations. To capture these variations, we control for school context variables as much as possible.

3.2 Research context: Dutch primary education[1]

In 2009 there were 6,901 primary schools that are responsible for the education of more than 1.5 million school students in the ages between four and 12. Dutch primary schools vary with respect to their educational philosophy or denomination. This variation developed from the principle of "freedom of education," which is embodied in the Dutch Constitution. Roughly 70% of all primary schools in the Netherlands are denominational schools.[2] The other 30% are non-denominational schools.

In the Netherlands, the executive oversight and administrative powers, such as the internal organization, the personnel and employment policies, and the financial management of the school—and ultimately for the school's performance, are assigned to the school board (Turkenburg, 2008). Although funding is based on schools' student characteristics, school boards have some discretion in their decision how to distribute the grants among their schools. School boards vary with respect to their size. In 2009, about 45% of all school boards in the Netherlands were responsible for a single school, and most school boards govern more than one school (sometimes even more than 60 schools). Despite their final accountability, most school boards delegate much authority and discretion to the school principal. In practice, most school principals establish the school's educational curriculum; supervise personnel processes; develop plans for pedagogical quality, student care, and quality control; and monitor student performance.

School principals are also the main representatives of the school in external contacts and therefore maintain relationships with organizations and actors in the school's environment. In the context of Dutch primary education, school principals maintain relationships with individual or collective actors, such as: the parent committee, the school board, local government, public libraries, youth care, the Inspectorate of Education, and test suppliers.

The Inspectorate of Education assesses all schools on the same final attainment levels. Most prominent is the standardized CITO test which provides information about both students'

1 An extensive discussion of the research context has been published in Torenvlied & Akkerman (2012) and Van den Bekerom et al. 2015). The present discussion focuses on context characteristics important for this study.

2 Roughly 29% have a Roman Catholic background, 26% have a Protestant denomination, and 11% have another denominational background (Islamic, Hindu, Jewish, or Waldorf school).

progress and the school's performance. Schools that fail to comply with the performance standards are subjected to an intensive supervision regime and an annual evaluation (which is made public). Schools that continue to fail ultimately risk losing their funding.

In the context of Dutch primary education, the main sources of a school's external red tape are rules, regulations, and procedures imposed by (a) national government organizations—including those for monitoring school performance, (b) local government organizations, and (c) interest organizations in the labor relations domain (Franssen, Pastors, & Van Rooijen, 2010; Torenvlied & Akkerman, 2012).

In the first place, primary schools receive numerous rules and rulings by the Dutch Ministry of Education, Culture and Science. This ministry formulates various compliance standards for many different performance indicators, varying from performance management and the documentation of student achievements, the school's social climate, and the application of educational programs, to the scores of students on standardized programs and human resource management (HRM). These standards are enforced and monitored by the independent Dutch Inspectorate of Education.

In the second place, local government—politicians and agencies—shapes the local conditions for the provision of education by deciding about the allocation of budgets to school improvements, the housing of schools, and public space and public safety issues. Local governments mediate between national government and primary schools because tasks and budgets have been partly decentralized to the local level. Local government monitors (a) the financial performance and results of subsidized projects—both nationally or locally funded; (b) the education administration system; and (c) the assignment and administration of weights for "care students," which determine the percentage of disadvantaged students. Thus, local government is responsible for (re)formulating important rules, regulations, and procedural constraints that affect preconditions for providing high quality education.

In the third place, personnel management at primary schools is constrained by national and sector-wide regulations. Interest organizations in the labor relations domain negotiate central, binding employment agreements with the Ministry of Education as the representative for employers at the bargaining table. The bargaining agreements set minimum standards and job classifications for personnel policies at school. Depending on school budgets and/or local constraints, school boards could decide to exceed these minimum standards.

3.3 Theoretical framework

3.3.1 Red tape and performance

Constraints to the organization emerge from several environmental dimensions. Scott (2003) distinguishes between the *task* environment (involving resource munificence, complexity, and dynamism), and the *institutional* environment (involving governmental policies and regulations). An alternative way to conceptualize environmental constraints is provided by the acronym PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) (Johnson & Scholes, 2002).

In the present chapter, we focus on constraints from the institutional, political, and legal environment of public organizations. We conceptualize these constraints in terms of external red tape. Red tape is often defined as "rules, regulations, and procedures that remain in force and entail a compliance burden for the organization but [do] not advance the legitimate purposes the rules were intended to serve" (Bozeman, 2000, p. 12). Although this definition is widely used, it has some limitations—"It is broad in scope and is not anchored to specific referents" (Pandey & Moynihan, 2006; also see: Pandey & Scott, 2002). A more "user-focused" definition of red tape is provided by Pandey and Kingsley (2000), who define red tape as "impressions on the part of managers that formalization (in the form of burdensome rules and regulations) is detrimental to the organization" (p. 782).

According to Bozeman's (1993; 2000) external control model, external red tape originates from the organizational environment through over-control by external entities and subunits. Ceteris paribus, external red tape potential increases with the number of external entities and subunits that develop rules that are to be implemented by the focal organization (Bozeman, 1993, 2000; Torenvlied & Akkerman, 2012). Three mechanisms drive this relation. First, the larger the number of external organizations defining the rules, the more opportunity for discretion in rule application will exist.[3] This discretion increases the likelihood of a *misapplication* of the rules, which results in (perceptions of) red tape. Second, the larger the number of external organizations that define the rules, the larger, and less harmonious, the loop in communications between rule-makers and rule applicants. Size and disharmony of the communication loop increase the likelihood of *miscommunications* between rule-makers and rule applicants. Third, as the number of external organizations defining the rules increases, control over the rules on part of the focal organization decreases which, in turn, reduces the *sense of rule ownership*. Rule misapplications, miscommunications, and a lack of rule-

3 Literature on political control proposes that conflict among legislators decreases goal clarity and increases the level of discretion granted to implementing agencies (for example, Horn, 1995; Chun & Rainey, 2005; Winter, 2006). That is, without conflict among external organizations developing the rules, the opportunity for discretion in rule application decreases. In the present study, the assumption that larger numbers of external organizations leads to increased discretion is ceteris paribus.

ownership result in a greater probability of rules being perceived as unnecessary compliance burdens. A study on English local government authorities shows that external control, indeed, positively affects perceptions of red tape (Brewer, Walker, Bozeman, Avellaneda, & Brewer, 2012).

Bozeman (1993) argues that complying with these burdensome rules is a waste of time and energy and, therefore, results in organizational "ineffectiveness and loss of morale" (p. 289). By crowding-out necessary resources from the organization's primary production process, burdensome rules and regulations negatively affect organizational performance (Scott & Pandey, 2000). In the field of education crowding-out necessary resources translates into school principals' and teachers' focus on complying with burdensome administrative rules and procedures, rather than concentrating and facilitating the educational process. Red tape also negatively affects organizational performance by disrupting the organization's internal rules and operating procedures. Obscure external rules may trigger managers to intensify or adjust existing internal rules and procedures of the organization (Bozeman, 1993). For example, unclear or unfeasible external performance standards may drive internal over-control by managers—hindering the organization's production function.

Empirical studies of the relation between red tape and organizational performance generally report the expected negative association (Brewer & Walker, 2010; Pandey & Moynihan, 2006; Pandey et al., 2007; Tummers et al., 2015; Walker & Brewer, 2009b). Two studies on U.S. primary human service agencies report that perceived personnel red tape and information systems red tape negatively affect self-reported organizational performance (Pandey et al., 2007; Pandey & Moynihan, 2006). Walker and Brewer (2009b) report that in English local government authorities, an index of overall perceived red tape negatively affects overall external performance—as measured by the core service performance (CSP) score of the Comprehensive Performance Assessment (CPA) score assigned by the English Audit Commission—as well as overall self-reported organizational performance. In a recent experimental study, Tummers et al. (2015) show that red tape has a strong negative effect on citizen satisfaction. Based on extant research, we thus expect that red tape is harmful for school performance:

Hypothesis 3.1: External red tape negatively affects school performance.

When looking at separate red tape items, Brewer and Walker (2010) report mixed results. For example, they find that internal red tape—measured as "the level of red tape in our service authority" (Brewer & Walker, 2010, p. 251)—negatively affects the majority of the self-reported performance items ("quality, effectiveness, equity, and social economic and environmental well-being"). Remarkably, external red tape—measured as "administrative rules and procedures [that] are open and responsive allowing stakeholders to freely interact

with our service/authority" (Brewer & Walker, 2010, p. 240)—is *positively* associated with the core CSP score, as well some self-reported performance measures (quality and equity).

3.3.2 Managing red tape

Current research on environmental shocks and public service performance show that management mitigates the harmful effects of shocks on performance (for example, Andrews et al., 2013; Boyne & Meier, 2009; Meier & O'Toole, 2009; Van den Bekerom et al., 2015; Zinn et al., 2009). Andrews et al. (2013), for example, show that the negative effect of an unexpected, sudden migration from Eastern Europe (associated with the eastern enlargement of the EU in 2004) on English local government performance is moderated by administrative capacity. Meier and O'Toole (2009) show that, when faced with strong negative effects of budget shocks, Texas school superintendent's internal management activities (for example, cost reduction in personnel or salaries) contribute to stability in. Van den Bekerom et al. (2015) show that Dutch primary school principals' internally oriented networking with co-producers and teachers attenuates the negative impact of abrupt changes in student enrollment on school performance. Much less empirical research, however, exists on how management interacts with predictable environmental constraints that likewise challenge the organization's functioning.

Pfeffer and Salancik (2003) distinguish between two roles that managers assume when responding to environmental constraints: Managers can be (a) advocators and/or (b) processors. In their first role, managers actively manipulate constraints and the social setting that the organization is part of (Pfeffer & Salancik, 2003). In the second role, managers process the various demands on the organization (Pfeffer & Salancik, 2003). Thus, whereas externally oriented management activities aim at *influencing* constraints, internally oriented management activities aim at *processing* constraints. The important assumption is that managers are able to apply both strategies simultaneously.

The external control model of red tape (Bozeman, 1993; 2000) informs us about how managers can *influence* the causes of red tape. Managers can reduce external red tape by effectively communicating with rule-imposing organizations in the environment of their organization (Bozeman, 2000). Because over-control produces rule misapplications, rule miscommunications, and a low sense of rule ownership, feedback from rule-imposing organizations will reduce managers' perceptions of external red tape (Torenvlied & Akkerman, 2012). Rules are likely to be "better understood" and less "capricious" if the ties between the rule-imposing organization and the rule-implementing organization are close (Bozeman, 2000, p. 129). Bad rules are more easily detected and remedies provided if communication between imposer and implementer is more frequent and of higher quality. The sense of rule ownership increases when managers play a role in rule development. Hence, interactions between rule-imposing organizations and public managers attenuate red tape and therefore

its negative effect on performance.

In the context of Dutch primary schools, Torenvlied and Akkerman (2012) find that school principals' perceived levels of personnel red tape are associated with their interactions with local government and labor interest groups. Walker and Brewer (2009a) report that English local government managers' perceived ability to influence the environment of their organization negatively affects their perception of red tape.[4] In the same context, Walker and Brewer (2009b) find that the perceived ability to influence the environment neutralizes the negative effect of red tape on performance, whereas the perceived extent to which service improvement is affected by inspectors' and auditors' reports amplifies the negative effect of red tape. Although this study suggests that management plays an important role in dealing with red tape, it does not study actual managerial action.

The studies above inform us about how managers can *influence* the causes of red tape by interacting with rule-imposing organizations. However, it remains an open question how, and to what extent, managers can *process* the (negative) consequences of red tape on the performance of their organization. O'Toole and Meier's (1999; 2011) model of public management states that perturbations in organizational stability, caused by environmental forces, result in reduced levels of organizational performance. Internal management activities aim to coordinate people and resources within the organization in order to stabilize the organization's structural and procedural features, thereby attenuating the negative effect of environmental shocks (Miner, Amburgey, & Stearns, 1990; O'Toole & Meier, 2011). We, therefore, expect that internal management will attenuate the negative impact of red tape on organizational performance.

In the present study, we conceptualize internal- and external management in terms of managerial networking, that is, the internally- and externally oriented relations public managers maintain with various types of actors and organizations (O'Toole et al., 2005; O'Toole & Meier, 2011). Recent studies of managerial networking show that managerial networking is a multidimensional concept (Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015). In line with these studies, we expect that contact with different types of organizations and actors attenuates red tape in different ways: by influencing the causes of red tape and/or by processing the negative consequences of red tape. We propose four networking orientations: "upward," "sideward," "downward," and "outward" (Moore, 1995; O'Toole et al., 2005; Van den Bekerom et al., 2015).

4 The effect, however, disappears when controlling for cross-departmental working relationships and managerial strategy. Brewer and Walker (2009a, p. 226) suggest that "management activity associated with integration and strategic management, which is controlled for in the final model, overshadows managers' explicit efforts to manipulate the external environment".

3.3.3 The moderating effect of managerial networking

Networking upward. Networking upward captures managers' networking activities with superiors. For Dutch primary schools, the school board is the main "principal" to the school. Because the school is governed by the school board, upward-oriented networking is considered as internal management. At times, the school board mediates between national government and primary schools because some rules and regulations, such as employment agreements, are decentralized to the school board. Some mechanisms in the principal-agent relationship between the school board and the school may produce a *negative* moderating effect of networking upward. Most importantly, contact with the school board may reflect over-control by the school board. Hence, school principals' activities to deal with such over-control might distract them from coordinating the primary process of providing education.

Conversely, constructive feedback from the school board can attenuate the negative effect of red tape by providing superior information about rules and regulations which reduces the likelihood of the misapplication and the miscommunication of rules, and increases the school principal's sense of rule ownership (Bozeman, 1993; 2000). Better knowledge about the burdensome rules and regulations also enables a more efficient use of resources to process the rules and prevents school principals from implementing more bureaucracy—thus stabilizing production and procedures within the school. In addition, the school board provides guidance and facilitates the processing of rules, regulations, and procedures, which also stabilizes the primary production process. One question, therefore, is whether upward-oriented networking attenuates or reinforces red tape. Given the preponderance of the theoretical arguments in favor of the attenuating effect, our expectation is in the former direction. Hence, we expect that upward-oriented networking attenuates the negative effects of red tape on performance through processing and influencing these constraints.

> **Hypothesis 3.2**: School principals' intensity of upward-oriented managerial networking attenuates the negative effect of external red tape on school performance.

Networking sideward. Networking sideward refers to managers' networking activities with co-producers. In the context of Dutch public schools, school principals need cooperation from actors such as other school principals, the participatory council, and the parent committee, to properly implement their organizational and educational goals, strategies and programs (Torenvlied et al., 2013). Here, we consider sideward-oriented managerial networking a management activity on the crossroad of internal and external management. Pfeffer and Salancik (2003) state that constraints are "potentially removable if it is possible to organize social support and resources sufficient to remove it" (p. 18). If public managers are at mobilizing other actors who share common interests and a common mission, such as co-producers, then they are better able to collectively influence rule makers. The better managers are able to

mobilize collective action, the more likely that burdensome rules will be adjusted. Influence in the implementation or content of the rules will also increase a principal's sense of rule ownership. Therefore, we expect that through processing and influencing red tape, sideward-oriented managerial networking attenuates the negative effect of red tape on performance.

> **Hypothesis 3.3**: School principals' intensity of sideward-oriented managerial networking attenuates the negative effect of external red tape on school performance.

Networking downward. Networking downward-oriented managerial networking refers to contact with subordinates. Hence, downward-oriented networking is considered as internal management. In the context of Dutch primary education, school principals coordinate activities by interacting with teachers and support staff. By setting clear and feasible goals and tasks (Moynihan et al., 2012), school principals prevent teachers from devoting scarce resources to burdensome rules that distract teachers from the primary production process. It could also be argued that contact between school principals and subordinates reflects managerial over-control (which may or may not be caused by external red tape) which distracts both subordinates and school principals from actions to maintain or improve performance. However, downward-oriented networking also creates the opportunity for constructive feedback (Moynihan et al., 2012) between the school principal and subordinates, which, in turn, decreases the likelihood of managerial over-control. Hence, by downward-oriented managerial networking principals can process the negative consequences of red , thereby stabilizing the educational process.

> **Hypothesis 3.4**: School principals' intensity of downward-oriented managerial networking attenuates the negative effect of external red tape on school performance.

Networking outward. Networking outward—managers' networking activities with rule-imposers—is clearly an external management activity. As explained above, contact between public managers and rule-imposing organizations is expected to attenuate the negative effect of external red tape on organizational performance by reducing the likelihood of the misapplication and the miscommunication of rules, and increasing the sense of rule ownership (Bozeman, 1993; 2000). In the context of teaching, school principals have networking relations with rule-imposing organizations such as national and local government actors (for example, the Dutch Ministry of Education and the Municipal Department of Education), as well as interest groups in the labor domain (for example, labor unions). By influencing the causes of red tape, school principals maintain production- and procedural stability, and ultimately school performance. Hence, we expect outward-oriented networking to attenuate the negative effect of external red tape on performance through influencing external red tape.

Hypothesis 3.5: School principals' intensity of outward-oriented managerial networking attenuates the negative effect of external red tape on school performance.

3.4 Research design[5]

3.4.1 Data collection

To test our hypotheses, we use a data set of Dutch primary school principals. The data set was constructed integrating three data sets of primary schools. The first data set contains information from a nation-wide survey we held among the principals of Dutch primary schools in January 2010, using a web-based survey. We asked the school principals, among others, for their managerial activities in the previous calendar year (where the scholastic year starts late August and ends early July). Principals of all 6,896 Dutch primary schools were invited by both mail and email to participate in the survey. Reminders were sent after two weeks. After six weeks, the response rate was 19.55% (n = 1,348). This rate is comparable with response rates reported by other studies of Dutch school principals, and is substantial given the work pressure on school principals and the prevalence of survey research in this sector.[6] The second data set is a data set from the Dutch Inspectorate of Education, which provides information about indicators of school performance. A third data set from the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency) provided information about student, school, and school board characteristics. The three data sets were matched by each school's unique identification number, assigned by the Dutch Ministry of Education, Culture and Science—a four digit code that allows the ministry to identify primary schools as separate educational units within school boards. After a listwise deletion of respondents who have missing values on the variables used in the analyses, the number of observations is 523. Below we discuss the construction of the different measures in the analysis.

3.4.2 Measures

School performance. The dependent variable in the present study is the school's average score of students on a standardized test for 2009 and 2010.[7] Dutch primary schools must use reliable and valid tests that meet the criteria of the Committee on Test Affairs Netherlands (Dutch:

5 Other recently published studies that use the same data set, but focused on different topics, have a somewhat comparable research design (Torenvlied & Akkerman, 2012; Van den Bekerom et al., 2015).

6 For example, the web-based survey of the Dutch Education Council (2008, p. 31) obtained a response of 15.6%. Torenvlied & Akkerman, who use the same data set performed an elaborate non-response analysis shows that schools in the sample do not differ with respect to a large number of relevant characteristics, such as school size, location, denomination, or quality assessment by the Inspectorate of Education (2012, p. 466; also see Appendix).

7 Rich assessment data from the Dutch Inspectorate of Education reports are not available, except for underperforming schools in a strict regime of oversight by the Inspectorate.

Commissie Testaangelegenheden Nederland). The most commonly used standardized test is the "Cito" test—roughly 75% of all primary schools participate voluntarily in this test. This test is taken in the second half of the eighth and final grade of primary education. The *Cito test score* is based on three sub-tests: for language (100 questions), arithmetic (60 questions), and study competences (40 questions). Students' scores on these 200 questions are transformed on a scale between 501 and 550. In 1976 Cito chose this range to avoid confusion with intelligence tests, while retaining a proper range (50 points) to map the responses from 200 questions. In 2009, about 154,000 students participated in the test—the average score of students was 535.5 (Cito, 2009). Each year, the test is calibrated, evaluated and adjusted. [8]

All primary schools are allowed to exempt specific, well-defined categories of students from the test: (a) students with severe language problems who have been living in the Netherlands less than four years, and (b) students with an indication for special secondary education, and sometimes for lower levels of vocational secondary education. Thus, our data do not include test scores of students referred to special education or second language students.

Despite the room for discretion, students' average Cito test scores (corrected for student characteristics) are considered to be an authoritative indicator for school performance by the Dutch Inspectorate of Education—and by most teachers and parents as well. As of 2013 the average Cito test scores of schools are freely accessible on the Internet. However, in 2010 the use of these data for analysis required the school's explicit consent. Therefore, we asked the school principal in the web-based survey to indicate whether the principal agreed on the use of the average Cito score data. About 75% of the school principals who responded to the survey gave permission to use the average Cito score data.[9]

Perceived red tape. In the present study, we analyze two independent variables for reported red tape: "personnel red tape" and "general external red tape" (see also Feeney & Rainey, 2010;

8 In the transformation, several steps are taken (Van Boxtel, Engelen, & De Wijs, 2011). Because each year new items are used, item-response models are applied to identify items that fit poorly on the scale. The item-difficulty is further calibrated using samples of pre-tests using tests from previous years. Comparability of test scores across years is guaranteed by estimating a normal curve equivalent. The 501—550 scale is devised as a linear equivalence transformation using the distribution of the earlier year. The standard error of the equivalence procedure is estimated by statistically comparing the variance in student scores for different groups of schools, using different years as a baseline. These tests show that the procedure is robust for different equivalence procedures.

9 On the basis of the consent rate of 75% of all school principals in our survey—combined with the percentage of schools that use the Cito score (75%)—we may expect that we have 56.25% of our cases valid for analysis. On the basis of 1,348 schools in our data set this percentage combines to 758 valid cases of performance. In the 2009 data set we have 718 valid cases for performance. Thus, the available cases roughly are what we would expect on the basis of the national data. The number of valid cases reduces to N = 546 because of missing cases in the various independent variables and controls.

Pandey & Scott, 2002;). The first independent variable is *personnel red tape*.[10] This is a prime indicator for red tape perception (Pandey & Kingsley, 2000; Pandey & Scott, 2002; Rainey, 1979; 1983; Rainey, Pandey, & Bozeman, 1995). We use the five items suggested by Pandey and Scott (2002), who build on Rainey (1979, 1983) and Rainey et al. (1995), asking school principals to indicate their level of agreement with the following statements—with response categories on a four-point Likert scale: "Strongly Disagree," "Disagree," "Agree," and "Strongly Agree." We slightly adapted the statements to fit the organization of primary education: (a) "Even if a school teacher is a poor performer, formal rules make it hard to remove him or her from the school organization", (b) "The rules governing promotion make it hard for a good teacher to move up faster than a poor one", (c) "Due to rules, pay raises for school teachers are based more on seniority than on performance", (d) "The formal pay structures and rules make it hard to reward a good teacher with higher pay here", and (e) "The personnel rules and procedures that govern my school organization make it easier for me to reward school teachers for good performance." The five items form a scale with a reliability coefficient (α = 0.62), that is just acceptable.

The second independent variable, the indicator for *general external red tape*, is measured by the responses of school principals to the following question: "If red tape is defined as 'burdensome administrative rules and procedures that negatively affect school performance,' how would you assess the level of red tape that is externally generated by the government?" Please tick the appropriate response between 0 and 10, with 0 indicating "Almost No Red Tape" and 10 indicating "Great Deal of Red Tape." The external red tape question has become one of the standard indicators in current red tape research (Bozeman & Feeney, 2011; Feeney, 2012). Pandey and Scott (2002) conclude—after reviewing multiple measures of red tape—that this general measure is a good index for red tape because it (a) best captures the widely accepted theoretical concepts behind red tape and (b) correlates well with other measures.[11] We explicitly added the phrase "that is externally generated by the government" to the question, to avoid tapping red tape that originates from the school board.

Networking orientations. We follow O'Toole and Meier's (2011) measurement of managerial networking as captured by the frequency of relations with organizations in the environment of the organization. Some scholars of managerial networking have pointed out the limitations of this measure (Goerdel, 2006; McGuire, 2002; Meier & O'Toole, 2005). McGuire (2002),

10 Personnel red tape in Dutch primary schools is externally generated, which is a distinctly different situation than described in the literature on personnel red tape (for example, Pandey and Scott, 2002; Feeney and Rainey, 2010), which assumes that personnel red tape is mainly internally generated (Torenvlied & Akkerman, 2012).

11 This measure has also received some criticism (cf. Feeney, 2012). Feeney (2012) for example states that the negative connotation of the survey instrument limits the conceptualization of red tape as something that only negatively affects organizational effectiveness. In addition, Feeney argues that this negative connotation generates an overall negative response.

for example, raises the concern that interaction frequency does not offer insights into the depth or meaning of those interactions. Moreover, interaction frequency does not provide information about who initiated the contact (Goerdel, 2006). Nevertheless, the frequency of interaction is a necessary precondition for meaningful interactions. At the same time, Meier and O'Toole (2005) show that the measure of managerial networking is a "reliable measure of management network activities that has demonstrated substantial empirical support" (p. 523).

To define the boundaries of Dutch primary school principals' networks, we approached a number of key informants from the educational domain, such as school principals, school board members, members from the Primary Education Council, and the Dutch Inspectorate of Education. These informants provided us with a list of potential types of organizations in the environment of the school: (a) organizations at different levels of the educational system (for example, the national, regional, local, and school-board levels) and (b) organizations with different functions in the educational system as broadly described above in the research context. This procedure resulted in a list of 41 different types of actors and organizations in the school's environment. We asked the school principals about their frequency of interaction with each of these organizations, using the categories "daily," "weekly," "monthly," "several times per year," "yearly," and "never." Thus, our research design replicates previous designs for the study of managerial networking (for example, Meier & O'Toole, 2003; O'Toole & Meier, 2011), but uses a much finer grid for measuring support than has been applied in previous research. To test the internal consistency of the networking orientations, we use a non-parametric variant of item-response theory (see Torenvlied et al., 2013; Zhu et al., 2014). For all the networking variables composed of multiple organizations, we computed a sum scale standardized with respect to the number of items in the scale.[12] All scales have a homogeneity *H* between 0.30 and 0.50, that is acceptable (Van Schuur, 2003). Below we discuss the scales for each of the networking orientations in more detail.

"Networking upward" is conceptualized as the self-reported interaction frequency of the school principal with the *school board*.

"Networking sideward" is conceptualized as *co-production networking*. The contact frequency items are: (a) "the parent committee," (b) "the participatory council," and (c) "principals of schools that are part of your school board." These three items form a co-production networking scale with an acceptable homogeneity ($H = 0.38$).

To measure "networking downward" we use the variable *team involvement*. The items tap the school principal's' interaction frequency with the staff concerning several issues: (a) "school identity and external communication," (b) "school housing and maintenance,"

12 The use of standardized sum scales allows us to interpret effect sizes of managerial networking orientation in a straightforward way (as they represent average interaction frequencies).

(c) "financial affairs," (d) "personnel and employment policy," (e) "quality of education," (f) "student results and performance monitoring," (g) "student care," (h) "educational quality," (i) "external relations," and (j) "scheduling and other practicalities."[13] The same response options that are used in the conventional measurement of managerial networking were used for the responses. The items form a scale with high internal consistency ($H = 0.40$).

"Networking outward" is conceptualized as managerial networking with a number of organizations external to the primary school or school board. We asked the school principals for their interaction frequency with organizations and actors that represent national government actors, local government actors, and interest organizations in the labor relations domain (Torenvlied & Akkerman, 2012). *Local government* actors and organizations are: (a) "members of city council," who are the representatives in the local political arena, (b) "aldermen," who are the chief administrators in the local government, and (c) the "municipal department of education," which is the main local government department responsible for implementing education policies in the local domain. The items on local networking activity form together a strong scale ($H = 0.51$).

National government actors and organizations are (a) the "DUO," which is the semi-autonomous government agency responsible for budgeting and finance, (b) the Dutch "Ministry of Education, Culture, and Science," which is the national government department responsible for formulating educational policies and programs, (c) "test suppliers," which are corporations that develop standardized tests for primary education; (d) the autonomous "Inspectorate of Education," which is responsible for monitoring school performance and auditing the schools on a wide variety of performance indicators. The four networking frequency items together form an intermediate strong "youth care" scale ($H = 0.46$).

Interest organizations in the labor relations domain are: (a) "labor unions," which are the labor unions for teaching and support staff; (b) "employer organizations," which are organizations that represent the interests of school principals, and (c) "the Primary Education Council," which is the employers' organization for school boards in primary education. The items on interest organization networking form together an intermediate strong scale ($H = 0.42$).

Controls. First, we control for student characteristics. The variable *percentage disadvantaged students* taps the percentage of students who carry a "student weight," indicating that the

13 These aspects were also derived on the basis of in-depth interviews with school principals, board members, and representatives from the Inspectorate of Education.

student needs additional support and resources.[14] We also control for several institutional characteristics of the school. First we control for the size of the school board, which is measured as *the number of schools* that are governed by the school board. The percentage disadvantaged students as well as school size are measured for t = 2009 and t = 2010. The variable *denomination* measures whether a school is a non-denominational school (1) or a denominational school (0). We furthermore include two measures that control for confounding effects that may arise from personality and psychological differences between school principals: their work engagement and experience. To measure *work engagement*, we use the "Utrecht Work Engagement Scale-9" (UWES-9) (Schaufeli, Bakker, & Salanova, 2006). Nine items capture vigor, meaningfulness, enthusiasm, and well-being, among others. The items form a scale with high internal consistency (Cronbach's alpha = 0.93). *Experience* is captured by the number of years that the school principal has worked as head of this specific school. Finally, in line with early Texas school district studies, we test an autoregressive model by including the lagged dependent variable *Cito test scores 2008*.

Table 3.1 provides summaries of the descriptive statistics and correlations between the variables in the analysis. The results show that the percentage of disadvantaged students and the lagged dependent variable are strongly correlated with the Cito test scores. The reported levels of external red tape and personnel red tape are only weakly correlated. Other weak and moderate correlations exist between the managerial networking variables.

3.5 Results

Because the study design nests the average Cito test scores of schools for two years (2009 and 2010) within schools, we apply multilevel regression analysis with fixed parameter values to test our hypotheses.[15] Multilevel regression analysis allows observations at the lowest level (year level) to be mutually dependent. Compared to ordinary least squares (OLS) regression analysis and OLS regression analysis correcting for clustered standard errors, multilevel models have more power and produce less biased standard errors (Hox, 2010; Cheah, 2009).

To test for the moderating effects of the managerial networking orientations on the relation between personnel- and external red tape and school performance, we constructed 12 (6x2)

14 The percentage of disadvantaged students is based on the so-called "student weights". Students are assigned specific weights if: both parents have only attended elementary school (0.25); they live in a foster home (0.4); both parents work in a circus or fair (0.7); one or both parents live at a trailer park (0.7); they have a non-Dutch cultural background; or if the father or mother (care taker) has finished a lower professional education at most; or if the highest-earning parent is employed in a profession in which (s)he does physical or hand labor, or is unemployed (0.9 if one of these conditions is satisfied). The numbers in parentheses are the weights used to calculate the additional funding for these disadvantaged students.

15 Two observations, or occasions, per group is enough to fit a multilevel model (Gelman & Hill, 2007).

Table 3.1 Descriptive statistics and correlations for all variables in the analyses (n=523)

		Mean	St. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Average Cito test scores	535.08	3.65	522.25	544.10	1.00													
2	Personnel red tape	3.05	0.56	1.20	4.00	-.03*	1.00												
3	General external red tape	6.72	1.84	1.00	1.00	.05*	.25*	1.00											
4	Contact with school board	3.78	1.34	1.00	6.00	.01	-.05*	-.02	1.00										
5	Co-production networking	4.06	0.66	1.33	6.00	-.06*	-.08*	-.07*	.08*	1.00									
6	Team involvement	2.42	0.55	1.20	4.20	.08*	.11*	.14*	.19*	.24*	1.00								
7	Local government networking	2.13	0.71	1.00	4.00	-.01	-.06*	.01	.19*	.17*	.20*	1.00							
8	National government networking	2.46	0.60	1.25	4.50	.02	.07*	.12*	.14*	.14*	.24*	.26*	1.00						
9	Interest group networking	1.94	0.78	1.00	4.67	.01	-.03*	.04*	.18*	.07*	.15*	.25*	.48*	1.00					
10	Work engagement	4.24	0.84	1.44	6.00	.04*	-.06*	-.05*	.08*	.08*	.02	.06*	.02	.14*	1.00				
11	Work experience	8.13	7.97	0.00	4.50	.10*	.12*	.02	-.04*	.03	.03	.10 *	.02	-.05*	-.09*	1.00			
12	Number of schools per board	15.99	12.40	1.00	64.00	-.17*	-.05*	-.05*	.14*	.21*	.02	.02	-.03*	-.08*	.10*	-.03	1.00		
13	% Disadvantaged students	0.74	14.76	-13.23	64.66	-.61*	.00	-.02	.05*	.04*	-.07*	.07*	-.05*	-.07*	.05*	-.09*	.18*	1.00	
14	Denomination (non-denominational = 1)	0.28	0.45	0.00	1.00	-.15*	.02	-.02	-.05*	.20*	.07*	.06*	-.00	-.14*	-.03*	.01	.15*	.14*	1.00
15	Lagged average Cito test scores	534.96	4.10	519.30	545.40	.63*	.04*	-.03	-.08*	-.08*	-.00	-.05*	.03*	.02	-.00	.07*	-.14*	-.50*	-.15*

Note. Mean value of year level variables used for correlations with school level variables.
*p<0.5.

variables interacting networking orientation with red tape.[16] We test the interaction effect of each managerial networking variable in a separate model in order to avoid multicollinearity problems (Jaccard, Turrisi, & Wan, 1990). Because the red tape variables and the managerial networking variables are measured at the highest level (school level), the interactions are within the same level of analysis. To compare the relative fit of two competing models, we use model deviance (Hox, 2010).

3.5.1 Effect of red tape on performance

Table 3.2 presents the results of a multilevel analysis testing whether personnel- and general external red tape negatively affect school performance. The first regression model is an empty baseline model, which contains only an intercept term and variance estimates at "Level 1," the year level (σ^2_e), and at "Level 2," the school level (σ^2_{u0}).17 These estimates provide insights into how much variance in Cito test scores we observe within schools over time and how much variance we observe between schools. The intraclass correlation coefficient (ICC), which is the proportion of variance at the school level, is estimated as p = 9.68 / (9.68 + 7.31) ≈ 0.60. Hence, 60% of the variance in average Cito test scores can be attributed to differences between schools. The remaining 40% can be attributed to differences within schools over time.ċ

The second model adds the managerial networking variables and control variables. Cito test scores are positively affected by work engagement and Cito test scores 2008. Moreover, contact with the school board and team involvement also positively affect Cito test scores, whereas networking with labor interest groups, the size of the school board (number of schools) and the percentage disadvantaged students negatively affect school performance.

Hypothesis 3.1 states that red tape negatively affects public service performance. Model 3 provides insights into a test of this hypothesis. We observe that perceived personnel red tape indeed negatively affects school performance. In terms of effect size, the effect of personnel red tape on Cito test scores is moderate: 0.49 / (544.10-522.25) x 100 ≈ 2.26%.[18] Hence, a 1-point increase in perceived personnel red tape reduces the average Cito test scores by 2.26%. For schools with the highest level of personnel red tape (4.0), Cito test scores are expected to drop by 9%.

The effect of general external red tape on Cito test scores is fundamentally different from the effect of personnel red tape. Cito test scores are *positively* affected by general external red

16 To simplify the interpretation of the intercept and the cross-level interactions, all explanatory variables except dichotomous variables are grand-mean centered (Hox, 2010).

17 For repeated measurement data (panel designs), the cases at the time-level are sampled following an ordered scheme, which results in an overestimation of variance at the time-level, and an underestimation of variance at the individual level (for details see Hox, 2010). To produce more realistic variance estimations for repeated measurement data, we add a time variable (year = 2010) to the empty model.

18 We calculated the effect size of personnel red tape by dividing the effect of personnel red tape by the range of Cito test scores and multiplying the quotient by 100. The direct effect of external red tape was similarly calculated.

Table 3.2 Multilevel regression analysis of average Cito test scores: direct effects of red tape

	Model 1 b/se	Model 2 b/se	Model 3 b/se
Year = 2010	.513**	.517**	.517**
	(.168)	(.168)	(.168)
Personnel red tape			-.493*
			(.205)
General external red tape			.146*
			(.062)
Lagged average Cito test scores		.353***	.359***
		(.029)	(.029)
Contact with school board		.162+	.162+
		(.087)	(.086)
Co-production networking		-.086	-.085
		(.180)	(.180)
Team involvement		.364+	.361+
		(.216)	(.218)
Local government networking		.173	.145
		(.168)	(.167)
National government networking		-.068	-.075
		(.217)	(.217)
Interest group networking		-.336*	-.348*
		(.169)	(.167)
Work engagement		.310*	.312*
		(.133)	(.132)
Work experience		.015	.019
		(.014)	(.014)
Number of school per board		-.016+	-.016+
		(.009)	(.009)
% Disadvantaged students		-.095***	-.093***
		(.009)	(.009)
Denomination (non-denominational = 1)		-.292	-.270
		(.257)	(.255)
Constant	534.830***	534.984***	535.002***
	(.180)	(.157)	(.156)

Table 3.2 Continued

	Model 1 b/se	Model 2 b/se	Model 3 b/se
(σ^2_e) (Level 1 – Year)	7.309	7.354	7.354
	(.453)	(.456)	(.456)
(σ^2_{u0}) (Level 2 – School)	9.676	2.591	2.482
	(.855)	(.451)	(.445)
N Level 1	1,042	1,042	1,042
N Level 2	523	523	523
Deviance	5,704,78	5,314,15	5,304,97
Likelihood-ratio test		390,62***	9,18*

Note. All explanatory variables except dichotomous variables are grand-mean centered; likelihood-ratio test is used to compare fit of model to preceding model.
+ p<.10, * p<.05, ** p<.01, *** p<.000

tape. A 1-point change in general external red tape increases the average Cito test scores with 0.69%. For school with the highest levels of general external red tape (10), Cito test scores are expected to cumulate to 6.9%. Hence, Hypothesis 3.1 is corroborated for personnel red tape but refuted for general external red tape. When we compare the residual variance of Model 2 and 3 the model fit improves significantly by adding the red tape variables. The residual variance between schools decreases by 4.2%. Hence, personnel- and general external red tape explains about 4% of the variance in Cito test scores between schools.[19]

In sum, we find partial support for the direct negative effect hypothesis of red tape on organizational performance (Hypothesis 3.1). The coefficient for the personnel red tape is negative and statistically significant. The coefficient for general external red tape is positive and statistically significant.

3.5.2 Moderating effects of managerial networking

The second part of our theory specifies the attenuating effects of networking upward (Hypothesis 3.2), networking sideward (Hypothesis 3.3) networking downward (Hypothesis 3.4), and networking outward (Hypothesis 3.5) on the negative effect of red tape on organizational performance. Table 3.3 shows the results of the moderating effects of networking on the negative effect of perceived personnel red tape. All outward-oriented networking variables, local government networking, national government networking, and interest group networking, attenuate the negative effects of school principals' perceived

19 Personnel red tape and external red tape explain each about 1,7% and 1,6%, respectively.

Table 3.3 Multilevel regression analysis of average Cito test scores: moderating effects of managerial networking on the effect of personnel red tape on performance (abbreviated: controls not presented)

	Model 4a b/se	**Model 4b b/se**	**Model 4c b/se**	**Model 4d b/se**	**Model 4e b/se**	**Model 4f b/se**
Personnel red tape	-.487*	-.493*	-.485*	-.477*	-.430*	-.495*
	(.206)	(.205)	(.205)	(.205)	(.206)	(.202)
General external red tape	.147*	.146*	.145*	.153*	.149*	.160**
	(.062)	(.062)	(.062)	(.062)	(.062)	(.061)
Contact with school board	.161+	.162+	.160+	.170*	.172*	.173*
	(.086)	(.086)	(.086)	(.086)	(.086)	(.085)
Co-production networking	-.083	-.086	-.092	-.086	-.083	-.038
	(.180)	(.182)	(.180)	(.179)	(.179)	(.178)
Team involvement	.355	.361+	.353	.354	.354	.333
	(.218)	(.218)	(.218)	(.217)	(.217)	(.215)
Local government networking	.148	.145	.152	.158	.160	.162
	(.167)	(.167)	(.167)	(.166)	(.166)	(.165)
National government networking	-.072	-.075	-.069	-.074	-.074	-.113
	(.217)	(.217)	(.217)	(.216)	(.216)	(.214)
Interest group networking	-.348*	-.348*	-.351*	-.346*	-.364*	-.352*
	(.167)	(.168)	(.167)	(.167)	(.167)	(.165)
Personnel red tape # Contact with school board	.046					
	(.144)					
Personnel red tape # Co-production networking		.004				
		(.318)				
Personnel red tape # Team involvement			.234			
			(.354)			
Personnel red tape # Local government networking				.474+		
				(.257)		
Personnel red tape # National government networking					.692*	
					(.322)	
Personnel red tape # Interest group networking						.897***
						(.237)
Constant	535.003***	535.002***	534.993***	535.008***	534.984***	535.026***
	(.156)	(.156)	(.156)	(.155)	(.155)	(.154)

Table 3.3 Continued

	Model 4a b/se	Model 4b b/se	Model 4c b/se	Model 4d b/se	Model 4e b/se	Model 4f b/se
σ^2_e (Level 1 – Year)	7.354	7.354	7.355	7.354	7.355	7.357
	(.456)	(.456)	(.456)	(.456)	(.456)	(.456)
(σ^2_{u0}) (Level 2 – School)	2.48	2.482	2.475	2.441	2.426	2.313
	(.445)	(.445)	(.445)	(.443)	(.442)	(.436)
N Level 1	1,042	1,042	1,042	1,042	1,042	1,042
N Level 2	523	523	523	523	523	523
Deviance	5,304.87	5,304.97	5,304.534	5,301.58	5,300.37	5,290.83
Likelihood-ratio test	.10	.00	.44	3.39+	4.60*	14.14***

Note. All equations control for yearly dummy, past performance, percentage disadvantaged students, work engagement, work experience, number of schools per board, and denomination; all explanatory variables except dichotomous variables are grand-mean centered; likelihood-ratio test is used to compare fit of Model 3 in Table 2.
+ p<.10, * p<.05, ** p<.01, *** p<.001

personnel red tape. The other interaction variables are not significant, but also positive.

Looking closely at effect sizes we obtain insights into the effectiveness of networking. In Model 4d, the unique effect of personnel red tape (-0.48) can be interpreted as the effect of personnel red tape on Cito test scores when local government networking is average (because the variables are centered), which is 2.13. The overall effect of personnel red tape on Cito test scores becomes -0.48 + 0.47 x local government networking. For school principals with the highest level of local government networking, 4.0 in our data, this implies that the effect of personnel red tape is -0.48 + 0.47 x (4.0 – 2.13) ≈ 0.40. Hence, principals who are very active in networking with local government are able to neutralize the negative effect of personnel red tape. In comparison with Model 3 in Table 3.2, the residual variance at the school level decreases with 1.65%. For school principals with the highest levels of national government networking (Model 4e) and interest group networking (Model 4f), the effects of personnel red tape are 0.71 and 1.95, respectively. In addition, the residual variance in comparison to Model 3 in Table 3.2, decrease with 2.26% for Model 4e and 6.81% for Model 4f.

We found that the direct effect of general external red tape on school performance is positive rather than the expected negative effect. Nevertheless, we test whether managerial networking reinforces that positive effect. Table 3.4 shows the results of the effects of the interactions of general external red tape and the different managerial networking orientations on school performance. We find that only the interaction between co-production networking and general external red tape is significant. However, the effect is negative. This implies that the positive effect of general external red tape is tempered when school principals spend much time interacting with co-producers. For school principals with the highest levels of co-

Table 3.4 Multilevel regression analysis of average Cito test scores: moderating effects of managerial networking on the effect of *general external red tape* on performance (abbreviated: controls not presented)

	Model 5a b/se	**Model 5b b/se**	**Model 5c b/se**	**Model 5d b/se**	**Model 5e b/se**	**Model 5f b/se**
Personnel red tape	-.500*	-.477*	-.493*	-.485*	-.498*	-.497*
	(.205)	(.205)	(.205)	(.206)	(.205)	(.205)
General red tape	.146*	.156*	.145*	.147*	.141*	.144*
	(.062)	(.062)	(.063)	(.062)	(.062)	(.062)
Contact with school board	.155+	.149+	.163+	.161+	.163+	.164+
	(.086)	(.086)	(.086)	(.086)	(.086)	(.086)
Co-production networking	-.097	-.047	-.087	-.080	-.091	-.090
	(.181)	(.181)	(.180)	(.180)	(.180)	(.180)
Team involvement	.380+	.359+	.366+	.364+	.367+	.362+
	(.219)	(.217)	(.219)	(.218)	(.218)	(.218)
Local government networking	.145	.126	.141	.155	.141	.144
	(.167)	(.167)	(.168)	(.168)	(.167)	(.167)
National government networking	-.082	-.102	-.076	-.070	-.095	-.088
	(.217)	(.217)	(.217)	(.217)	(.218)	(.218)
Interest group networking	-.345*	-.351*	-.349*	-.349*	-.355*	-.354*
	(.167)	(.167)	(.167)	(.167)	(.167)	(.167)
General red tape # Contact with school board	-.031					
	(.045)					
General red tape # Co-production networking		-.185+				
		(.097)				
General red tape # Team involvement			-.022			
			(.112)			
General red tape # Local government networking				.042		
				(.084)		
General red tape # National government networking					-.075	
					(.097)	
General red tape # Interest group networking						-.056
						(.076)
Constant	535.002***	534.996***	535.005***	535.002***	535.014***	535.005***
	(.156)	(.155)	(.157)	(.156)	(.157)	(.156)

Table 3.4 Continued

	Model 5a b/se	Model 5b b/se	Model 5c b/se	Model 5d b/se	Model 5e b/se	Model 5f b/se
σ^2_e (Level 1 – Year)	7.354	7.353	7.354	7.354	7.354	7.354
	.456	.456	.456	.456	.456	.456
(σ^2_{u0}) (Level 2 – School)	2.476	2.440	2.482	2.478	2.475	2.476
	.445	.443	.445	.445	.445	.445
N Level 1	1,042	1,042	1,042	1,042	1,042	1,042
N Level 2	523	523	523	523	523	523
Deviance	5,304.49	5,301.33	5,304.93	5,304.72	5,304.37	5,304.44
Likelihood-ratio test	.48	3.64+	.00	.25	.6	.53

Note. All equations control for yearly dummy, past performance, percentage disadvantaged students, work engagement, work experience, number of schools per board, and denomination; all explanatory variables except dichotomous variables are grand-mean centered; likelihood-ratio test is used to compare fit of Model 3 in Table 2.
+ p<.10, * p<.05, ** p<.01, *** p<.001

production networking, the effect of external red tape is -0.20.

All in all, we find support for Hypothesis 3.5. The coefficients for the interaction term of personnel red tape, with local government networking, national government networking, and interest group networking, were all positive and statistically significant. Hence, outward-oriented managerial networking attenuates the negative effect of personnel red tape on school performance.

3.6 Conclusion and discussion

In this chapter, we studied (a) the effect of predictable environmental constraints, specifically red tape, on organizational performance in the context of Dutch primary schools, and (b) how different networking orientations of school directors moderate this effect. Based on the analyses we draw a number of conclusions. In line with our theoretical expectations, we find that *personnel* red tape has a negative effect on school performance—thus replicating results from previous studies (Pandey et al., 2007; Pandey & Moynihan, 2006; Walker & Brewer, 2009b) and, thereby, providing further evidence for the red tape-performance hypothesis (Bozeman, 1993; 2000; Gore, 1993; Kaufman, 1977). Because personnel red tape reflects specific limitations on managerial action, the implication of this finding is that personnel flexibility potentially improves public service performance.

Contrary to our expectations we find that *general* external red tape positively affects school performance. Such a positive effect of red tape was also reported Brewer and Walker (2010, p. 245) in a study of English local governments. One explanation for the positive effect found,

could lie in the negative connotation of the survey instrument. Feeney (2012) notes that the survey instrument measuring external red tape triggers an "overall negative response," because the negative connotation substitutes "for all negative aspects of bureaucracy" (p. 428). Red type, by definition, cannot positively affect performance. Hence, we may not have measured general external red tape, but rather the principal's overall sense of rule-based restrictions—including "green tape" (DeHart-Davis, 2009). Consequently, principals of well-performing primary schools could be more inclined to report higher levels of "red tape" (bureaucracy) than principals of low-performing schools. Further development of objective indicators for red tape may shed more light on these measurement issues (Kaufmann & Feeney, 2012). Our results suggest that future research into red tape should adopt the multidimensional nature of red tape and study the quality of rules as opposed to general perceptions of red tape (cf., Bozeman, 2012). Our results also suggest that public managers differ substantially with respect to their tolerance for (negative) rule-based restrictions. Here too lies an avenue for future research.

The present study also shows that school principals' managerial networking activities moderate the relation between personnel red tape and performance. As theoretically expected, the intensity of outward-oriented managerial networking activities of school directors significantly attenuates the negative effect of personnel red tape on organizational performance. The data do not provide evidence for the other hypothesized moderating effects of school directors' networking activities on the relation between red tape and school performance. Thus, our results provide further support for both Bozeman's (1993; 2000) external control model.

Our results also extend O'Toole and Meier's (1999; 2011) model of public management in the sense that managerial networking attenuates not only the negative effects of environmental shocks on organizational performance, but also the negative impact of more stable and predictable environmental constraints. Precisely the outward-oriented networking activities (with national government actors, local government actors, and interest groups in the labor domain) aim to influence relatively predictable rule-constraints, improving the effectiveness and efficiency of the educational production function at schools, and therefore contributing to school performance. A recent study on the negative effect of environmental shocks, in the same context, shows that shocks (measured as changes in student intake) are absorbed by interactions with actors that are part of or in close proximity to the organization (that is, more internally oriented managerial networking activities) rather than outward-oriented managerial networking (Van den Bekerom et al., 2015). Hence, although managerial activities attenuate the negative impact of environmental shocks and constraints, the precise mechanisms may be context-dependent. Thus, we should test the existing models of public management and performance in more different, contexts—providing multiple conceptualizations of environmental shocks and environmental constraints.

There are a number of limitations of the present study that point toward specific directions for future research. First, we theoretically argued that external red tape might negatively influence performance through higher levels of internal red tape. However, we did not intend to reveal the underlying mechanisms of this relation. It would be interesting to examine whether managerial responses to constraints—red tape more specifically—create a different set of constraints within their organization.

Moreover, compelling arguments can be made for a reversed link between red tape and performance. For example, more rules, and hence potential sources of red tape, may be imposed on low performing organizations. Managers could also report high levels of red tape in order to rationalize or blame the poor performance of their organization. We attempted to deal with the issue of reversed causality by including a (lagged) performance variable for performance in the previous year to test an "autoregressive model". Moreover, we used longitudinal school performance data, which were measured independently from the survey. Future research on red tape should use longitudinal data for both dependent and independent variables.

4

Making performance management work

This chapter is currently under review (submitted as: Van den Bekerom, P. Making Performance Management Work? The Moderating Effect of Managerial networking).

4.1 Introduction

The public management literature often emphasizes the necessity—and benefits—of performance management (for example, De Bruijn, 2007; Moynihan, 2008; Van Dooren & Van de Walle, 2008; Boyne, 2010). Under New Public Management (NPM), the measurement and use of performance information has become a core element of administrative management (Hood, 1991). Performance information—what Moynihan (2008, p. 6) calls the "lifeblood" of performance management—is used to make better-informed decisions and actively manage the organization. Next to the traditional focus on managing inputs (budgets and staffing) and managing processes (rules and precedents), performance management focuses on "managing for results" (Moynihan, 2008; Boyne, 2010). The main purpose of performance management is program improvement (Heinrich, 2002; de Lancer Julnes, 2008).

Effective performance management starts with the selection of appropriate indicators to measure organizational performance (Boyne, 2010; De Bruijn, 2007). After collecting performance information, managers must make the information meaningful (Van de Walle & Van Dooren, 2010; Kravchuk & Schack, 1996; March, 1989) and specify clear and unambiguous organizational goals and performance targets (Boyne, 2010; Chun & Rainey, 2005). Managers must then take appropriate action to achieve these organizational goals through internal management strategies (Armstrong, 2009; Poister, 2010; Boyne, 2010).

Several empirical studies show that performance management is positively associated with organizational performance (for example, Poister, Pasha, & Hamilton Edwards, 2013; Sun & Van Ryzin, 2012; Melkers & Willoughby, 2005; Berman & Wang, 2000; Heinrich, 1999; 2002; Boyne & Chen, 2007). However, some studies also report null findings (Hvidman & Andersen, 2013; Moynihan, 2008), and some studies find negative effects of performance management on organizational performance (Boyne & Gould-Williams, 2003; Hood, 2012; Nielsen, 2013). The fact that the existing research on performance management shows mixed results could be explained by the idea that organizations need to get the environmental and organizational conditions right to achieve effective performance management (Andrews, 2014). After all, performance management "does not operate in a vacuum" (Andrews, 2014, p. 2; Boyne, 2010). Although a recent systematic review of the literature on performance information use suggests that several individual and organizational factors explain the use of performance information (Kroll, 2014), little empirical research is available concerning the conditions under which the use of performance information affects public service performance (for exceptions, see Hvidman & Andersen, 2013; Nielsen, 2013; Wang & Wang, 2009). Hence, to further our understanding of how performance management affects organizational performance, we must study the conditional effect of performance management (Jennings & Haist, 2004; Moynihan, 2009).

Recent theoretical insights pertain to the role of managerial networking with stakeholders to make performance management work (Moynihan & Hawes, 2012; Van de Walle & Van Dooren, 2010). In general, we expect that networking provides public organizations with superior information about macro-and organizational level goals, about how to use and interpret performance information, and about how to translate performance information into clear and feasible goals for subordinates.

This chapter examines the conditional effect of performance management by identifying the conditions under which managerial networking with external stakeholders moderates the effect of performance management on organizational performance. We distinguish among several stable networking dimensions (Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015; Van den Bekerom, Torenvlied, & Akkerman, 2015) rather than using a one-dimensional networking activity index (for example, Meier & O'Toole, 2001; Meier & O'Toole, 2003; Walker, O'Toole, & Meier, 2007).

The context of the present study is Dutch primary education. For the last decade, performance management has been firmly on the quality agenda for Dutch primary education (Visscher & Ehren, 2011). The hypotheses are tested using survey data related to Dutch school management in combination with school performance data which were measured independently from the survey (481 schools). In the following section, hypotheses are developed concerning the conditional and indirect effects of performance management on public sector performance. We then outline the data and methods before presenting the results. Finally, we discuss the article's findings and draw conclusions.

4.2 Research context: Dutch primary education[1]

All Dutch primary schools are managed by school principals. In 2013, 6,742 primary schools were responsible for the education of more than 1.5 million school students in the ages between four and twelve. Dutch primary schools have two main responsibilities: (a) to qualify students by promoting their cognitive skills, primarily in language and arithmetic, and (b) to socialize students by promoting their social and moral development in citizenship behavior. Accountable for the attainment of these goals, and school performance, are the school principal, and ultimately the school board.

In the Netherlands, the school board is formally accountable for the internal organization, the personnel and employment policies, and the financial management of the school, and sequentially for the school's performance (Turkenburg, 2008). About 45% of all school boards in the Netherlands are responsible for a single school, and most school boards govern more

1 An extensive discussion of the research context has been published in Torenvlied & Akkerman (2012) and Van den Bekerom et al. 2015). The present discussion focuses on context characteristics important for this study.

than one school (sometimes even as many as 60 schools). Despite their final accountability, most school boards delegate much authority and discretion to the school principal.

In practice, most school principals establish the school's educational curriculum; they coach teachers; develop plans for pedagogical quality, student care, and quality control; and monitor student performance. School principals also have considerable administrative duties associated with the day-to-day management of the school. They are responsible for the planning of activities, human resource management, and the development and maintenance of buildings. School principals are also the main representatives of the school in external contacts, and therefore, maintain relationships with organizations and actors in the school's environment, such as: the parent committee, the school board, local government, public libraries, youth care, the Inspectorate of Education, and test suppliers.

In the context of Dutch primary education, performance management is referred to as 'outcome-oriented teaching' or 'performance-driven teaching' (Dutch: opbrengstgericht werken). Performance-driven teaching is understood to mean an cyclical process in which schools let themselves be guided by measurements of targets, set at the level of the board, the school, the team, and the student. The idea is that, due to performance-driven teaching, students will perform better. Within the framework of the Quality Agenda 2007 for primary education, Dutch national government has developed several initiatives to encourage schools to employ 'performance-driven teaching', such as: the introduction of benchmark levels (Dutch: referentieniveaus) for mathematics and language specifically, which prescribe the degree of proficiency that must be attained in any given year of schooling; and several performance-based incentives (Visscher & Ehren, 2011, p. 2). Though, it was not before 2009 that schools were actively informed about both the importance of 'performance-driven teaching' and how to utilize instruments for the evaluation of their educational program (Visscher & Ehren, 2012).

Dutch school principals are responsible for the organization and implementation of 'performance-driven teaching'. An important part of the cyclical process of performance-driven teaching is evaluating various parts of the educational program, such as the evaluation of: student results, teaching and assessment methods, and student care policies. There are several instruments for the evaluation of the educational program. An important instrument for performance evaluation is the student tracking system (Dutch: leerlingvolgsysteem). Schools are encouraged to use data from the student tracking system to reflect on student growth and learning gains.[2] Student tracking systems are preset to national benchmark levels and often include a set of standardized tests. These tests mainly concern instrumental skills, such as language, arithmetic, and study competences.

2 As of 2014-2015, all primary schools are obligated to use student tracking systems.

Feedback from secondary education on former students is another source for performance information. In general, secondary schools provide primary schools with feedback on the progress of former students after the first and second year of secondary education.

Moreover, the Dutch Inspectorate of Education assesses all schools on the same final attainment levels. Schools that fail to comply with the performance standards are subjected to an intensive supervision regime and an annual evaluation (which is made public). Schools that that continue to fail ultimately risk losing their funding. The Dutch Inspectorate of Education publishes various reports school principals can use for performance management, such as: quality inspection school reports, reports after thematic inspections, reports of incidental inspections, and the Inspectorate's annual report on the state of education in the Netherlands (The Dutch Inspectorate of Education, 2012).

Teacher observations are another source of performance information. Teachers document their observations on students' progress in individual student files (Dutch: leerlingdossiers). The main part of the student file is the educational report which includes the student's results, his or her attitude, as well as possible concerns.

A last example of an instrument for the evaluation of the educational program is the individual examination of care students. To get insights into the underlying causes of students' problems, schools can conduct individual examinations. These examinations can be didactic (to test knowledge and skills) or psychological (to test intelligence and personality), and will show whether a student meets the criteria to get a diagnosis.

4.3 Theoretical framework

4.3.1 Performance management and performance

Performance management is sometimes referred to as "managing for results" (Moynihan, 2006; Wholey, 2001) or "managing outcomes" (Heinrich, 2002). Boyne (2010) describes three interlinked elements of performance management: "selecting indicators, setting targets, and taking action to influence scores on the indicators and the extent of target achievement" (p. 209). These three elements match Moynihan's (2008) definition of performance management: "a system that generates performance information through strategic planning and performance measurement routines and that connects this information to decision venues, where, ideally, the information influences a range of possible decisions" (p. 5). Typically, performance management is implemented at two levels: at the macro level across a set of public organizations within the same policy field (for example, all primary schools in The Netherlands) and at the micro level within public organizations (such as within a single Dutch primary school) (Andrews, 2014; De Bruijn, 2007). The present study focuses on performance management at the micro level—that is, the school level.

Performance management is often characterized as a cyclical process (Smith, 1995; Moynihan, 2008; Hvidman & Andersen, 2013; Nielsen, 2013). Based on stakeholder input, such as macro-level benchmark levels and rules set by elected officials (Jakobsen & Mortensen, 2015), and (feedback on) previous performance, managers engage in results-oriented strategic planning by specifying goals and setting performance targets and then take action to achieve their goals and targets through effective internal management practices. These management practices involve reallocating resources, developing organization-improvement strategies, sharing organizational goals and targets with employees and motivating employees in a way that enables performance targets to be achieved (Armstrong, 2009: Holzer & Yang, 2004; Den Hartog, Boselie, & Paauwe, 2004). Next, organizations engage in performance measurement using appropriate performance measurement instruments. Performance information is then communicated to and evaluated by external stakeholders, such as elected officials and monitoring agencies, and evaluated and interpreted by the organization itself. Public managers should then repeat this cycle and adjust organizational targets, goals, and/or performance indicators to reflect past experiences, if necessary.

Performance measurement and evaluation is used widely, but the use of performance measures is also criticized (for example, De Bruijn, 2007; Bouckaert & Balk, 1991; Smith, 1995; Van Thiel & Leeuw, 2002). For example, several scholars have argued that performance measurement inhibits innovations and ambitions, which causes organizational ossification (Smith, 1995; De Bruijn, 2007; Van Thiel & Leeuw, 2002). Another important point of such criticism is that performance measurement leads to "symbolic behavior," "that is, monitoring appears to be in place but is in fact not" (Van Thiel & Leeuw, 2002, 270). In addition, another unintended consequence of performance measurement is the performance paradox (Meyer & Gupta, 1994; Van Thiel & Leeuw, 2000), which refers to a weak correlation between the measured indices and performance itself. The emphasis on (easily) quantifiable performance indicators becomes problematic in situations that involve a divergence between the measurement scheme and organizational objectives (Smith, 1995; De Bruijn, 2007). These unintended consequences of performance measurement may invalidate conclusions about performance and negatively influence performance (Van Thiel & Leeuw, 2002).

Notwithstanding these important unintended effects of performance management, in line with existing performance management studies, we expect performance management to positively contribute to organizational performance. As explicitly described in the context section above, the school principal is responsible for the implementation of performance management. It is the school principal's task to measure or collect performance information, to update the educational policy and revise targets by using evaluation results when necessary, to propagate these changes to his or hers educational staff, and ultimately, to maximize the school's strategic objectives. Therefore, we expect school principals' performance management activities to affect school performance.

Hypothesis 4.1: Performance management positively affects organizational performance.

4.3.2 The moderating effect of managerial networking

A considerable body of work within the field of public management has discussed the importance of managerial networking, that is, the relations that managers maintain with actors and organizations in the environments of their organizations (for example, O'Toole, 2015; Meier & O'Toole, 2005; Lecy, Mergel & Schmitz, 2014; Torenvlied, Akkerman, Meier, & O'Toole, 2013; Torenvlied & Akkerman, 2014). According to O'Toole (2015), public managers' outward-oriented networking activities with external actors, such as government organizations, businesses, and non-profit organizations, "perform a number of functions, such as building support, negotiating with other in an agency's external environment, contributing to the management of multi-organizational efforts, exploiting opportunities, protecting the core organization from challenges or threats, and sometimes helping move a set of organizations toward an objective" (p. 361). In addition, managers are also involved in networking upward with political principals and superiors, downward with subordinates (Moore, 1995; O'Toole, Meier, & Nicholson-Crotty, 2005), and sideward with co-producers (Van den Bekerom et al., 2015). These more internally oriented management activities aim to optimize an organization's stabilizing features, such as structural, productional, procedural, and personnel stability (O'Toole & Meier, 2011).

Over the last decade, the number of quantitative empirical studies on the effect of managerial networking on organizational performance has grown substantially. The vast majority of these studies show that managerial networking has a positive effect on public sector performance (e.g., Meier & O'Toole, 2003; Nicholson-Crotty & O'Toole, 2004; Leana & Pil, 2006; Goerdel, 2006). Moreover, other studies provide evidence for the moderating function of managerial networking, primarily examining whether managerial networking attenuates the negative effect of environmental shocks on performance (Meier & O'Toole, 2009; O'Toole & Meier, 2010; Meier, O'Toole, & Hicklin, 2010; Andrews et al., 2013; Van den Bekerom et al., 2015).

Although prior studies have (implicitly) theorized about the benefits of managerial networking in relation to the performance management-performance relation (Moynihan & Hawes, 2012; Van de Walle & Van Dooren, 2010), no existing empirical work has examined this specific relation. Moynihan and Hawes (2012) studied the direct effect of managerial networking and found that Texas superintendents' managerial networking activities are positively related to performance information use. The present study focuses on the moderating effect of managerial networking on the performance management-performance relation. Below we discuss the moderating function of managerial networking in great detail. We distinguish among "networking outward," "networking upward," and "networking downward" (Moore, 1995; O'Toole et al., 2005; Van den Bekerom et al., 2015).

Networking outward. Networking outward refers to managers' interactions with various types of external actors and external organizations, "such as suppliers, [external] stakeholders, alliance partners, regulatory agencies, or political institutions" (Torenvlied et al., 2013, p. 252). In the context of Dutch primary education, school principals have networking relations with external organizations, such as national and local government actors (for example, the Dutch Ministry of Education and the Municipal Department of Education), as well as youth care organizations (Torenvlied & Akkerman, 2012; Van den Bekerom et al., 2015). Moynihan and Hawes (2012) argue that managers' networking activities with external stakeholders give "stakeholders a chance to demand results-based accountability, thereby encouraging performance information use to improve organizational effectiveness" (p. 598). Although the mere use of performance information is no guarantee for effective performance management, it is the most important precondition for setting clear and feasible goals.

According to Hvidman and Anderson (2013), even if managers collect performance information, "they need to know how to react [to performance information], that is, they need to know what their goals are" (p. 39). However, a lack of goal clarity is a feature that is often associated with public organizations (McGuire, 2001; Dahl & Lindblom, 1953; Downs, 1967; Rainey & Bozeman, 2000; Hvidman & Andersen, 2013). When managers attempt to translate such "ambiguous, nontangible policy objectives into operational goals", the likelihood of deviations in policy implementation increases (Van Thiel & Leeuw, 2002, p. 275). Because stakeholders, particularly well-organized stakeholders, often have (more) resources to examine and more performance information to utilize (Pollitt, 2011; Moynihan & Hawes, 2012; Van de Walle & Van Dooren, 2010), they are better at identifying problems—and sometimes solutions—in organizational performance through comparisons across similar micro-level organizations and comparisons over time (Greve, 2003; Moynihan & Landuyt, 2009). Therefore, we argue that external stakeholders can improve goal clarity by providing public organizations with superior information about macro-and organization-level goals, about how to use and interpret performance information, and about how to translate performance information into clear and feasible goals for subordinates.

Comparable explanations are given by Van de Walle and Van Dooren (2010) and Parsons (1995). Those authors suggest that performance management benefits from interacting with stakeholders through the reduction of 'groupthink.' Groupthink refers to "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' striving for unanimity override their motivation to realistically appraise alternative courses of action" (Janis 1982, p. 9). Paraphrasing Parsons (1995), Van de Walle and Van Dooren (2010, p. 47) state that "as a result of groupthink, certain information is misinterpreted or not used at all; there is a selective bias in information interpretation; a poor search for information; an incomplete survey of alternatives; risks of the preferred choice are not examined; and initially

rejected information or alternatives are not re-examined" (p. 347). The authors propose that (contact with) stakeholders challenges the organization through discussion and interaction with devil's advocates, thereby avoiding these groupthink-related performance management failures.

In line with this reasoning, we expect that the payoff from performance management will be contingent on managers' outward networking activities.

Hypothesis 4.2: School principals' intensity of outward-oriented managerial networking reinforces the positive effect of performance management on school performance.

Networking upward. Networking upward captures managers' networking activities with superiors. For Dutch primary schools, the school board is the main "principal" to the school. Initially, we would expect interactions with the board to generate the same benefits for the effect of performance management as the aforementioned benefits of networking outward: encouraging performance information use, providing superior information about goals, about how to make sense of performance information, and about how to translate the information into clear and feasible goals, and reducing groupthink. However, due to the principal-agent nature of the relationship—a problem that is associated primarily with public organizations—some mechanisms in the relation with the school board may produce a negative moderating effect of networking upward. A "principal's" (that is, a school board's) strong emphasis on monitoring and efficiency may result in over-control, which may in turn crowd out resources from the performance management process. Therefore, one question is whether managing upward reinforces or attenuates the positive effect of performance management. Given the preponderance of the previous theoretical arguments, our expectation is in the positive direction.

Hypothesis 4.3: School principals' intensity of upward-oriented managerial networking reinforces the positive effect of performance management on school performance.

Networking downward. Downward-oriented managerial networking refers to contact with subordinates. More specifically, networking downward denotes managers' regular involvement of and consultation with subordinates regarding a broad range of organizational matters (O'Toole, Torenvlied, Akkerman, & Meier, 2014; Van den Bekerom et al., 2015). Although internal management entails more than just interacting with subordinates, interaction with subordinates is a necessary precondition for meaningful internal management (O'Toole, Meier, & Nicholson-Crotty, 2005). In the context of Dutch primary education, subordinates consist of teachers and support staff.

After collecting performance information, managers must make sense of the available performance information (Van de Walle & Van Dooren, 2010; Kravchuk & Schack, 1996; March, 1989) and specify clear and unambiguous organizational goals and performance targets (Boyne, 2010; Chun & Rainey, 2005). We argue that by increasing the participation of employees in the decision-making process (Simon 1997), both public managers' sense-making activities and their ability to set clear and feasible goals will improve. Hence, we expect downward-oriented networking to attenuate the positive effect of performance management on organizational performance.

Hypothesis 4.4: School principals' intensity of downward-oriented managerial networking reinforces the positive effect of performance management on school performance.

4.4 Research design[3]

4.4.1 Data collection

To test these hypotheses, we use a data set that consists of information about 481 school principals. The data set was constructed by integrating two data sets related to primary schools. The first data set contains information from a nation-wide survey that was held among principals of Dutch primary schools. The survey data were collected in the second half of 2013, using an internet survey. Principals of all *6,742* Dutch primary schools were invited to participate in the survey by email. The invitation included a personal link to the project website. Reminders were sent after two, five and eight weeks. After eight weeks, the response rate was 13.29% (n = 896). This rate slightly is lower than response rates reported by other studies of Dutch school principals.[4] However, the current response rate is substantial given the work pressure on school principals and the prevalence of survey research in this sector.[5] These data are combined with a second data set from the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency), which provides information about student and school characteristics, as well as objective performance data, which were measured independently from the survey.

3 Other recently published studies that used the same data set but focused on different topics have a somewhat comparable research design (Torenvlied & Akkerman, 2012; Van den Bekerom et al., 2015).

4 For example, the first wave of the Dutch school management project (2010) had a response rate of 19.55%, and the web-based survey of the Dutch Education Council (2008, p. 31) had a response of 15.6%. The response rate in the Texas studies was 55% (Meier & O'Toole, 2003, p. 692).

5 A non-response analysis shows that schools in the analysis do not differ with respect to certain critical characteristics: school performance, the percentage of disadvantaged students and educational vision (see Table A3 in the Appendix). However, larger schools and schools with a Roman Catholic denomination are slightly overrepresented.

4.4.2 Measures

School performance. The dependent variable in the present study is the school's average student scores on a standardized test that is taken in the second half of the eighth and final grade of primary education. Approximately 75% of all primary schools participate voluntarily in this 'Cito' test—which is named after the independent institute that develops, supplies, and administers the scores. The Cito test score is based on three sub-tests: language (100 questions), arithmetic (60 questions), and study competences (40 questions). For each component, such as arithmetic, an expert from Cito designs the assignments together with an average of three primary school teachers. Students' scores on these 200 questions are transformed on a scale between 501 and 550. The 2010, 2012, and 2014 test scores are being used to measure the effect of performance management on school performance.

The Cito scores are very important in the Dutch system of education. Secondary education is divided into different sub-categories (special education, vocational education, and higher secondary education), and many different sub-levels exist within these categories. Students are referred to a specific level of higher secondary education by their teachers, in collaboration with representatives from secondary education schools. The referral of students to secondary education is in large part based on their individual Cito test scores. Some secondary schools apply a strict minimum Cito score in their admittance decisions.

The Cito test has not been without controversy and challenges. Standardized tests do not measure all of the relevant aspects of the performance of an educational system. Thus, some primary schools use intelligence tests as the basis for student referral. In addition, schools are allowed to exempt specific, well-defined categories of students from the test: students with severe language problems who live in the Netherlands for a period shorter than four years, students with an indication for special education, or students with an indication for vocational secondary education.

Despite this room for discretion, the Cito test score is considered to be authoritative by the Dutch Inspectorate of Education, as well as by most teachers and parents. It is vital for the reliability of the Cito test that all students participating in the Cito test take the test under similar circumstances. Thus, it is of great importance that the test remains confidential until the moment of assessment—which takes place on the same day nationwide. From the moment the test material is delivered to the school, the school principal is legally responsible for the confidentiality of the test and the manner in which the test is administered.

Performance management. In the present study, performance management is captured by the use and the duration of use of performance management tools. Key experts on primary education from the Dutch Inspectorate of Education provided a list of potential sources of performance information: (a) "data from pupil tracking systems," (b) "assessments by the Dutch Inspectorate of Education," (c) "feedback from secondary education on former pupils,"

(d) "teacher observations," and (e) "individual examinations of (care) pupils." The school principals were asked: "If your school uses any of the following instruments, for how long have they been in use?" The response categories for all five items were "not in use," "in use less than 1 year," "1-2 years," "3-5 years," "more than 5 years," and "don't know" (Hvidman & Andersen, 2013).[6] The category "don't know" is coded as missing. These performance management tools form a scale with a reliability coefficient (Cronbach's alpha = 0.60) that is just acceptable.[7]

We follow Hvidman and Andersen's (2013) and Nielsen's (2013) analytical strategy for examining the effect of performance management. Given the response categories, it is possible to identify the performance management tools that were being used in a certain year (see Table 4.1). To ensure that the use of a performance information tool can affect performance, a lag of at least 1-year in the relationship of a specific performance information tool to performance is necessary (Hvidman & Anderson, 2013; Nielsen, 2013). For example, if a school principal answered in the second half of 2013 that a certain performance information tool had been in use for 1-2 years, then the use of that specific tool could not have had an impact on school performance in 2010. For each year (2010, 2012, and 2014), the separate items were coded 0 or 1 according to whether the performance management items were being used least 1 year prior to that year's Cito test. This approach resulted in variations in the use of performance management tools within schools over time. Subsequently, we computed a sum scale with a range of 0-5 that measures the level of a school's adoption of performance management tools in a given year (Nielsen, 2013). Table 4.2 shows how the use of performance management tools developed over time among Dutch primary schools from 2010 to 2014.

Table 4.1 Introduction of Performance management tools (coding)

Response category	Not in use	<1 Year	1-2 Years	3-5 Years	>5 Years	Don't know
Before Cito test in 2010	÷	÷	÷	+	+	Missing
Before Cito test in 2012	÷	÷	+	+	+	Missing
Before Cito test in 2014	÷	+	+	+	+	Missing

Note. School principals filled out the survey in the second half of 2013

6 On the theoretical level, a cautionary note must be made: whereas Hvidman and Andersen's (2013) measure actually reflects the "cyclical understanding of performance management" (Nielsen 2013, p. 442), our measure focuses on the use of performance information in the decision-making process. However, any strategic action that a manager takes in the performance management cycle—such as written objectives for the school, quality development (Hvidman & Andersen, 2013), or offering training to subordinates (Den Hartog, Boselie, & Paauwe, 2004)—cannot take place without the use of performance information. Hence, the use of performance information is a precursor to performance management.

7 One can argue that the items capture different dimensions of performance management tools. A distinction can be made between internal and external performance information (De Bruijn, 2007; Boyne, 2010; Hammerschmid, Van de Walle, & Štimac, 2013). The items "data from pupil tracking systems," "feedback from secondary education on former pupils," and "assessments by the Dutch Inspectorate of Education" are all set by external stakeholders and provide performance information about externally set benchmark levels, whereas "teacher observations" and "individual examinations of (care) pupils" are internal performance assessment instruments. However, an additional factor analysis shows that one factor exists (eigenvalue = 1.16) on which all five items load positively.

Table 4.2 Developments over time in the use of performance management tools

Number of performance management tools	Proportions of schools using performance management tools					
	2010		2012		2014	
0	14	(2.21%)	2	(0.32%)	1	(0.16%)
1	31	(4.89%)	5	(0.79%)	1	(0.16%)
2	68	(10.73%)	15	(2.37%)	3	(0.47%)
3	132	(20.82%)	74	(11.67%)	33	(5.21%)
4	183	(28.86%)	175	(27.60%)	154	(24.29%)
5	206	(32.49%)	363	(57.26%)	442	(69.72%)
Total	634		634		634	

Networking orientations. O'Toole and Meier's (2011) measurement of the moderator managerial networking, as captured by the frequency of relations with organizations in the environment, is followed. The school principals were asked about their frequency of interaction with a list of fifteen types of organizations and actors in the environment of the school, using the categories "never," "yearly," "several times per year," "monthly," "weekly," and "daily."[8] Recent empirical advancements in the measurement of managerial networking have shown that public managers differentiate their contacts with different types of stakeholder groups in order to achieve different goals (Torenvlied et al., 2013; Zhu et al., 2014). Hence, managerial networking is not a one-dimensional networking activity index. We created the three networking orientations (outward, upward, and downward) by summing the relevant items.

To test the internal consistency of the networking scales that are used to measure the different managerial networking orientations (except upward-oriented networking), we use Mokken scale analysis (MSA), which is a non-parametric variant of item-response theory (Mokken, 1971; also see Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015). MSA is based on the assumption that items are ordered hierarchically, which means that items are ordered based on the degree of "popularity" (Van Schuur, 2003). MSA assumes that an item can be included in a scale only once, whereas factor analysis assumes that items can contribute to several latent factors.[9] When using MSA, a participant's scale score is therefore the sum of her scores on each item in the scale (Torenvlied et al., 2013). Cumulative scales must satisfy two main criteria. "The first, and most important criterion is

8 A first wave of this survey asked school principals about forty-one different types of external organizations and actors. However, due to space restrictions, the length of the managerial networking scale in the 2013 survey was reduced to fifteen items.

9 For a discussion about why MSA is a more appropriate scaling technique than factor analysis to test for multiple dimensions of managerial networking, see Torenvlied et al. (2013).

that each cumulative scale must be at least a weak scale", as defined by its homogeneity index H ($H > 0.30$), and each item i in the scale should have an item homogeneity index $Hi > 0.30$ (Torenvlied, et al., 2013, p. 259). These lower boundaries are standard for MSA (Molenaar, Mokken, Van Schuur & Sijtsma, 2000; Jacoby, 2000). For all scales, we computed a sum scale that was standardized with respect to the number of items in the scale. Below, we discuss the scales in more detail.

"Networking upward" is conceptualized as the self-reported interaction frequency of the school principal with the *school board*.

To measure "networking downward," we use the variable *team involvement*. The items tap the school principal's' interaction frequency with the staff concerning several issues: (a) "school identity and external communication," (b) "school housing and maintenance," (c) "financial affairs," (d) "personnel and employment policy," (e) "quality of education," (f) "pupil results and performance monitoring," (g) "pupil care," (h) "educational quality," (i) "external relations," and (j) "scheduling and other practicalities."[10] The same response options that are used in the conventional measurement of managerial networking were used for the responses. The items form a scale with a high internal consistency ($H = 0.40$).

In line with these studies, three "networking outward" scales emerge from the MSA; these scales satisfy the criterion of homogeneity and are well-interpretable in the context of the work of school principals. Moreover, these dimensions also emerged from the data obtained from the first wave of this survey, which was collected in early 2010 (see Torenvlied & Akkerman, 2012; O'Toole, Torenvlied, Akkerman, & Meier, 2013, Van den Bekerom et al., 2015). These three dimensions are labeled: (a) *local government* networking, (b) *national government* networking, and (c) *youth care* networking.

The local government networking scale is formed by three items: (a) the "municipal department of education," which is the main local government department responsible for implementing education policies in the local domain, (b) "members of city council," who are the representatives in the local political arena, and (c) "aldermen," who are the chief administrators in the local government. The combined items on local government networking form a strong scale ($H = 0.54$).

The national government networking scale is formed by four items: (a) "test suppliers," which are corporations that develop standardized tests for primary education, (b) the "DUO," which is the semi-autonomous government agency responsible for budgeting and finance, (c) the autonomous "Inspectorate of Education," which is responsible for monitoring school performance and auditing the schools on a wide variety of performance indicators, and (d) the Dutch "Ministry of Education, Culture, and Science," which is the national government

10 These aspects were also derived on the basis of in-depth interviews with school principals, board members, and representatives from the Inspectorate of Education.

department responsible for formulating educational policies and programs. All organizations in the national government networking scale are involved in the process of assigning accountability to schools with respect to their specific student achievements, educational climate, and financial management. The four networking frequency items together form a scale with intermediate strength ($H = 0.37$).

The youth care networking scale is formed by four items: (a) "the school attendance officer," (b) "regional youth care," (c) "neighborhood police," and (d) "municipal youth service." This set of local organizations provide youth care and child protection. Specifically, these organizations develop prevention programs (for example, regarding health and safety in and around the school) and help schools and students with students' school careers and problems, such as educational delays, behavioral problems, child abuse and neglect. The four youth care items form a scale with a high internal consistency ($H = 0.46$).

Controls. A number of control variables are added to the analysis that might confound the relation between performance management and performance. First, the analysis includes two measures that control for confounding effects that may arise from a crucial potential difference between school principals. To measure *work engagement*, six items from the "Utrecht Work Engagement Scale-9" (UWES-9) are used (Schaufeli, Bakker, & Salanova, 2006). The six items capture vigor, dedication, and absorption. The items form a scale with a high internal consistency (Cronbach's alpha = 0.92). *Experience* is captured by the number of years that the school principal has worked as head of a primary school. To reduce potential bias produced by principals who were not school principals in 2010, we confine the analyses to school principals with at least three years of experience. In addition, the analysis controls for the increased challenges associated with educating disadvantaged students. To reduce potential bias produced by principals who were not a school principal in 2010, we confine the analyses to school principals with at least a three year experience in their function. The variable *percentage disadvantaged students* taps the percentage of students who carry a "pupil weight," indicating that the student needs additional support and resources.[11] We also control for two institutional characteristics of the school. First, we control for the size of the school board, which is measured as *the number of schools* that are governed by the school board. The variable *denomination* measures whether a school is a non-denominational school (1) or a denominational school (0).

11 The percentage of disadvantaged students is based on the so-called "pupil weights." Students are assigned specific weights if: both parents have only attended elementary school (0.25); they live in a foster home (0.4); both parents work in a circus or fair (0.7); one or both parents live in a trailer park (0.7); they have a non-Dutch cultural background; the father or mother (care taker) has finished a lower professional education at most; or the highest-earning parent is employed in a profession in which (s)he does physical or hand labor or is unemployed (0.9 if one of these conditions is satisfied). The numbers in parentheses are the weights used to calculate the additional funding for these disadvantaged students.

Table 4.3 provides summaries of the descriptive statistics and correlations between the variables in the analysis. Because Cito test scores and performance management are nested within schools over time, we use the mean values of Cito test scores and performance management to compute the correlations with all other variables. The results show that there is a very weak positive correlation between Cito test scores and performance management. There are very weak correlations between performance management and the networking scales. Other weak to moderate correlations exist between the managerial networking scales.

4.4.3 Analytical strategy

To analyze our nested data (observations on performance and performance management nested within schools over time), multilevel regression analysis with fixed parameter values is used. Multilevel regression analysis allows observations at the lowest level (year level) to be mutually dependent, thereby controlling for the possibility that errors are correlated within schools due to (unobserved) school characteristics. Compared to ordinary least squares (OLS) regression analysis and OLS regression analysis correcting for clustered standard errors, multilevel models have more power and produce less biased standard errors (Hox, 2010; Cheah, 2009). We use model deviance to compare the relative fit of two competing models (Hox, 2010).

To rule out any unobserved heterogeneity at the school level, we apply fixed effects models. These models account for both observed and unobserved time-constant variables (Hox, 2010). However, fixed effects models do not rule out time-varying unobserved heterogeneity, such as reversed causality. Compelling arguments can be made for a reversed link between performance management and performance. For example, high-performing organizations may have more opportunities to invest in their performance management systems because they have greater bargaining power to advocate for their programs; therefore, such organizations make a better case for more resources (Van de Walle & Bovaird, 2007; Moynihan & Hawes, 2012). To test for such a reversed causal effect, we tested whether school performance during a certain period has a significant effect on performance management during the subsequent period. The results presented in Table 4.4 show that Cito test scores for 2010 do not have a significant effect on the level of performance management in 2012. Similarly, performance management in 2014 is not significantly impacted by Cito test scores for 2012. Therefore, we conclude that a reversed link between performance management and performance is unlikely.

Table 4.3 Descriptive statistics and correlations for all variables in the analyses (n=481)

		Mean	St. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Average Cito test scores	535.00	3.32	524.43	546.37	1.000										
(2)	Performance management	4.24	.80	.00	5.00	.040*	1.000									
(3)	School board contact	3.22	1.19	.00	5.00	-.023	-.013	1.000								
(4)	Team involvement	2.42	.59	1.10	4.50	.071*	.090*	.196*	1.000							
(5)	Local government networking	1.16	.75	.00	3.67	.051*	.084*	.219*	.227*	1.000						
(6)	National government networking	1.50	.66	.00	4.00	.027	.022	.132*	.195*	.303*	1.000					
(7)	Youth care networking	1.86	.66	.00	4.00	-.170*	.052*	.178*	.279*	.269*	.236*	1.000				
(8)	Work engagement	5.31	.90	2.33	7.00	-.022	.014	.078*	.045*	.019	-.078*	.068*	1.000			
(9)	Work experience	14.28	9.54	3.00	43.00	.085*	.099*	-.082*	-.001	-.002	.069*	-.079*	-.055*	1.000		
(10)	% Disadvantaged students	12.07	13.02	.00	84.31	-.596*	-.002	.057*	-.012	.027	.071*	.217*	.030	.026	1.000	
(11)	Number of schools board	16.11	13.41	1.00	64.00	-.157*	.072*	.008	.052*	-.111*	-.070*	.096*	-.074*	-.030	.204*	1.000
(12)	Denomination[a]	.29	.45	.00	1.00	-.152*	.018	-.032*	.009	-.074*	-.029	.025	-.010	.027	.223*	.177*

Significance level: * $p<0.05$; [a] reference category is denominational schools; mean values of Cito test scores and performance management (year level variables) used for correlations with other (school level) variables.

Table 4.4 Ordinary least squares (OLS) regression analysis of performance management in 2012 and 2014

	Performance management 2012	**Performance management 2014**
	b/se	**b/se**
Average Cito test scores 2010	.017	
	(.012)	
Average Cito test scores 2012		-.014
		(.009)
N	450	460

Note. Both models include full set of control variables.

The aim of the analysis is twofold. First, we want to test the effect of performance management on school performance. Second, we want to test the moderating effects of the different managerial networking orientations on the relationship between performance management and school performance. To test the effect of performance management on school performance, we follow Hvidman and Andersen (2013), who, rather than examining the effect of performance management on its own, examine how the extent to which Danish schools have adopted performance management over time affects school performance over time. This approach takes into account the cyclical nature of performance management. Following Hvidman and Andersen (2013), an interaction variable of *Time* (2010 = 0; 2012 = 1; and 2014 = 2) and *Performance management* (the adoption status in 2010, 2012 and 2014) was constructed. By testing the effect of this interaction variable on school performance, we take into account the cyclical understanding of performance management (Smith, 1995; Moynihan, 2008; Nielsen, 2013).

To test the moderating effect of the five managerial networking scales, we computed five three-way interaction variables between *Performance management*, *Time* and each *Networking* variable. To avoid problems concerning multicollinearity, we test the interaction effect of each managerial networking variable in a separate model (Jaccard, Turrisi, & Wan, 1990). The three-way interactions are modeled by polynomial regression equations (Hox, 2010).

The networking variables are assumed to be time-constant and are measured in the second half of 2013. The fact that managerial networking is only measured once and measured between the second (2012) and third (2014) periods in our study, could result in selection bias—meaning that the level of managerial networking in 2013 is correlated with the prior effect of performance management. However, studies of Texas school districts have shown that the intra-superintendent correlations of managerial networking between years are relatively strong, which indicates that "managerial networking is unlikely to be the result of pressure from other actors" (Meier & O'Toole, 2005, p. 531). We assume that managerial networking is fairly stable over time.

4.5 Results

4.5.1 Effect of performance management

Table 4.5 presents the results of a multilevel analysis testing whether performance management (*Performance management* * *Time*) positively affects school performance. Model 0 is a baseline model, which contains only the time estimate, an intercept term, and variance estimates at "Level 1," the year level (σ^2_e), and at "Level 2," the school level (σ^2_{u0}).[12] The variance estimates provide insights into how much variance in Cito test scores we observe *within schools* between 2010, 2012, and 2014 (Level 1) and how much variance we observe *between schools* (Level 2). The intraclass correlation coefficient (ICC), which is the proportion of variance between schools, is estimated as $p = 8.32 / (8.32 + 7.75) \approx 0.52$. Hence, 52% of the variance in Cito test scores can be attributed to differences between schools. The remaining 48% can be attributed to differences *within schools over time*. The time variable shows that schools experienced a negative trend in Cito test scores between 2010 and 2014. The model predicts a Cito test score value of 535.32 for 2010, which decreases by 0.34 in each succeeding year.

Model 1 adds all networking variables and the control variables. We find that team involvement and work experience both positively affect Cito test scores. Youth care networking and the percentage of disadvantaged students have a negative effect on Cito test scores. The percentage reduction in variance at Level 2 is 54.7. The significant drop in unexplained variance between schools is expected because all networking variables and control variables are Level 2 variables. The model fit improves significantly in comparison to the baseline model.

The next step is to test our first hypothesis. Before we introduce the interaction term between performance management and time, we add performance management to Model 2.

The performance management estimate shows that performance management has no significant effect on school performance. Hence, regardless of time, the sheer number of performance management tools that have been adopted by schools has no effect on school performance. Model 3 shows the estimate for the interaction between performance management and time. The estimate is significant, indicating that the extent to which primary schools have adopted performance management tools over time negatively affects Cito test scores. In other words, an increase in the use of performance management tools is associated with a drop in school performance. The residual variance of Model 3 at the school level decreases by 0.8 percent. The percentage reduction in variance at Level 1 is only 0.3, which shows that residual variance within schools decreases slightly over time after adding the interaction variable. The model fit improves significantly in comparison to Model 2. Hence,

12 For repeated measurement data (panel designs), it is standard to add a time variable to the baseline model (for details, see Hox, 2010).

Hypothesis 4.1 is refuted. Over time, the adoption of additional performance management tools negatively affects school performance.

Looking closely at effect sizes, we obtain insights into the (in)effectiveness of performance management. In Model 3, the unique effect of performance management (0.18) can be interpreted as the effect of performance management on Cito test scores in 2010. The overall effect of performance management on Cito test scores becomes 0.18 – 0.28 x time. For 2014 (which was coded "2"), this outcome implies that the effect of performance management is 0.18 – 0.28 x 2 ≈ -.38. Hence, for 2014, Cito test scores are expected to drop by (-.38 / (546.37-524.43) x 100) ≈ 1.73%, which is a modest negative effect.

Figure 4.1 depicts the regression lines for performance management, which are presented separately for the time values 2010, 2012, and 2014. The figure shows that the adoption of performance management tools for (at least) one year has a positive effect on school performance in 2010. While schools start out with higher Cito test scores in 2012 and 2014,

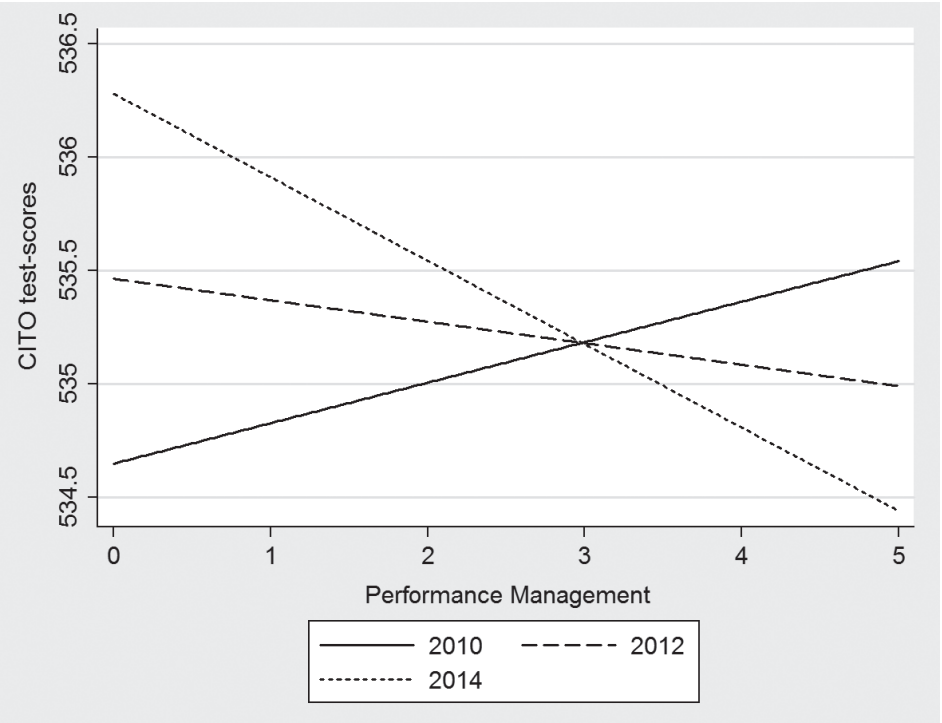

Figure 4.1 Regression lines for performance management, separate for 2010, 2012, and 2014.

Table 4.5 Multilevel regression analysis of average Cito test scores: direct effects of performance management

	Model 0	Model 1	Model 2	Model 3
	b/se	b/se	b/se	b/se
Time	-.342***	-.368***	-.392***	-.338**
	(.093)	(.093)	(.104)	(.107)
Performance management			.055	.179
			(.106)	(.117)
Performance management * Time				-.273*
				(.113)
School board contact		-.003	-.001	-.006
		(.104)	(.104)	(.104)
Team involvement		.350+	.343	.363+
		(.212)	(.213)	(.212)
Local government networking		.249	.244	.245
		(.172)	(.173)	(.172)
National government networking		.226	.227	.218
		(.191)	(.191)	(.190)
Youth care networking		-.351+	-.352+	-.336+
		(.200)	(.200)	(.199)
Work engagement		.036	.035	.040
		(.131)	(.131)	(.131)
Work experience		.033**	.033**	.033**
		(.012)	(.012)	(.012)
% Disadvantaged students		-.152***	-.151***	-.152***
		(.010)	(.010)	(.010)
Number of schools board		-.005	-.006	-.005
		(.009)	(.009)	(.009)
Denomination		-.131	-.132	-.136
		(.268)	(.268)	(.267)
Constant	535.315***	535.419***	535.444***	535.476***
	(.179)	(.170)	(.177)	(.177)
σ^2_e (Level 1 – Year)	7.745	7.813	7.811	7.785
	(.366)	(.372)	(.371)	(.370)
σ^2_{u0} (Level 2 – School)	8.319	3.764	3.763	3.734
	(.729)	(.449)	(.449)	(.446)
N Level 1	1,375	1,375	1,375	1,375
N Level 2	481	481	481	481
Deviance	7,387.44	7,142.81	7,142.54	7,136.71
Likelihood-ratio test		244.64***	.27	5.83*

Note. All explanatory variables, except dichotomous variables and *Time,* are grand-mean centered; likelihood-ratio test is used to compare fit of model to preceding model.
Significance levels: $^{\dagger}p < .1$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.
[a]Reference category is denominational schools.

the effect of performance management is negative for 2012 and even worse for 2014.[13]

4.5.2 The moderating effects of managerial networking

The second part of our theory specifies the moderating effects of networking outward (Hypothesis 4.2), networking upward (Hypothesis 4.3), and networking downward (Hypothesis 4.4) on the positive effect of performance management on school performance. Although we found that performance management has a negative effect on school performance over time, we test whether managerial networking attenuates that negative effect. As stated above, to test the moderating effect of managerial networking, we computed five three-way interaction variables (*Performance management * Time * Networking*). Each three-way interaction is tested in a separate polynomial regression equation. Table 4.6 presents the results of these three-way interactions. These three-way interactions compare the net effect of performance management for principals with high levels of managerial networking in comparison to principals with low levels of managerial networking. We find that only the interaction between performance management, time and contact with the school board is significant. However, the effect is negative. This finding implies that the negative effect of performance management over time is reinforced when school principals spend more time interacting with the school board, which is the main "principal" to the school. The residual variance of Model 4 at the school level decreases by 0.05 percent, which shows that the residual variance between schools decreases only slightly after adding the three-way interaction variable. The percentage reduction in variance at Level 1 is 0.7. The model fit improves significantly in comparison to Model 3. Overall, we find no support for our hypotheses concerning the moderating function of managerial networking on the effect of performance management on school performance. Instead, networking upward (Hypothesis 4.3) reinforces the negative effect of performance management over time.

4.6 Discussion

To extend previous research on the relationship between performance management and public service performance, we examined the effect of performance management on performance and investigated whether this relation is moderated by managerial networking.

In line with recent empirical studies of performance management, we captured performance management by both the use and the duration of use of performance

13 We also tested the effect of the interaction between performance management and the dummy variables for *Time*. The results show that the effect of performance management for 2010 is not significantly stronger than the effect of performance management for 2012, and the effect of performance management for 2012 is not significantly stronger than the effect for 2014. However, performance management for 2010 has a significantly stronger effect than performance management for 2014.

Table 4.6 Multilevel regression analysis of average Cito test scores: moderating effects of managerial networking on the effect of performance management on performance (abbreviated: controls not presented)

	Model 4 b/se	Model 5 b/se	Model 6 b/se	Model 7 b/se	Model 8 b/se
	Contact with school board	**Team involvement**	**Local government networking**	**National government networking**	**Youth care networking**
Performance management	.183	.173	.182	.178	.184
	(.117)	(.118)	(.119)	(.118)	(.118)
Time	-.341**	-.342**	-.340**	-.340**	-.332**
	(.106)	(.107)	(.107)	(.107)	(.108)
School board contact	.165	-.012	-.007	-.005	-.006
	(.135)	(.104)	(.104)	(.104)	(.104)
Team involvement	.378+	.470+	.358+	.364+	.368+
	(.212)	(.282)	(.212)	(.212)	(.212)
Local government networking	.248	.256	.208	.240	.241
	(.172)	(.173)	(.221)	(.173)	(.172)
National government networking	.222	.214	.212	.095	.220
	(.190)	(.190)	(.191)	(.249)	(.190)
Youth care networking	-.350+	-.345+	-.336+	-.334+	-.464+
	(.199)	(.199)	(.199)	(.199)	(.255)
Performance management * Time	-.284*	-.268*	-.272*	-.273*	-.288*
	(.113)	(.114)	(.114)	(.113)	(.115)
Performance management * Networking	.112	.076	-.032	-.043	-.109
	(.100)	(.191)	(.158)	(.175)	(.176)
Time * Networking	-.110	-.129	.057	.133	.135
	(.090)	(.176)	(.142)	(.160)	(.164)
Performance management * Time * Networking	-.197*	.101	-.056	-.038	-.019
	(.098)	(.167)	(.150)	(.167)	(.181)
Constant	535.486***	535.471***	535.482***	535.479***	535.478***
	(.177)	(.177)	(.178)	(.177)	(.177)
σ^2_e (Level 1 – Year)	7.733	7.775	7.782	7.780	7.770
	(.368)	(.370)	(.370)	(.370)	(.370)
σ^2_{u0} (Level 2 – School)	3.372	3.739	3.735	3.734	3.751
	(.444)	(.446)	(.446)	(.446)	(.447)
N Level 1	1,375	1,375	1,375	1,375	1,375
N Level 2	481	481	481	481	481
Deviance	7,129.20	7,135.57	7,136.38	7,136.02	7,135.86
Likelihood-ratio test	7.51+	1.14	.33	.69	.85

Note. All equations control for other variables in Table 3; all explanatory variables except dichotomous variables are grand-mean centered; likelihood-ratio test is used to compare fit of model to Model 3 in Table 2.
Significance levels: $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

management tools (Hvidman & Andersen, 2013; Nielsen, 2013). This measure allowed us to study whether variation in the use of performance management tools occurred over time. The results show that variation indeed occurred. In 2010, nearly 18% of the schools used zero to two performance management tools in comparison to less than 1% of the schools in 2014. In addition, the percentage of schools that used five performance management tools increased from 32% in 2010 to 70% in 2014. Variation in the use of these performance management tools can be explained by the fact that the Dutch government started a campaign in 2009 concerning the importance and significance of 'performance-driven teaching.'

To test the effect of performance management on school performance, we modeled the development of the use of performance management tools over time. The results show that an increase in the use of performance management tools from one year to the next has a negative effect on school performance. One possible explanation for these striking results could be the elusiveness of public policy objectives (McGuire, 2001; Dahl & Lindblom, 1953; Downs, 1967; Rainey & Bozeman, 2000; Hvidman & Andersen, 2013). Because public policies often have many goals, which are sometimes contradictory, performance indicators are usually contested measures—between managers and politicians, as well as between politicians (McGuire, 2001; Van Thiel & Leeuw, 2002). Because "it is difficult to determine which objectives are most important and to whom", the use of these contested measures thwarts the evaluation of performance information (Van Thiel & Leeuw, 2002, p. 272). The use of multiple performance indicators can thus—unintentionally—harm organizational performance. Another explanation might be that performance measurement inhibits innovations and ambitions, which causes organizational ossification (Smith, 1995; De Bruijn, 2007; Van Thiel & Leeuw, 2002).

However, the results also suggest that in 2010, one year after the aforementioned national campaign related to performance management, the use of performance management tools had a positive effect on school performance. Yet, for the 2012 and 2014 final exams, the use of performance management tools can be considered harmful. One possible explanation for this result is that performance indicators have a tendency to run down over time (Meyer & Gupta, 1994; Van Thiel & Leeuw, 2002). This process is called positive learning: "as performance improves, indicators lose their sensitivity in detecting bad performance" (Van Thiel & Leeuw, 2002, p. 271). As Van Thiel and Leeuw (2002) explain, in situations in which everyone in the organization has become highly skilled at her job, performance indicators become obsolete. A comparable explanation is found in the red tape literature. Rule-evolved red tape refers to rules that evolve into red tape over any period of time (Bozeman, 1993; 2000; Bozeman & Feeney, 2011). "Change in the functional object" is a specific type of rule-evolved red tape. If the objective of a rule becomes redundant (for example, because the problem the rule aims to tackle has been solved) but the rule is still followed, the rule becomes red tape.

Next to these literature-based explanations, the context of primary education may also

yield some possible explanations for why we find that the use of performance management tools has a negative effect on school performance. The most obvious explanation would be that, while school principals are encouraged to use performance indicators, they simply lack the knowledge to evaluate performance information, make informed decisions, and translate performance information in to feasible goals. Moreover, all the attention to and focus on achieving better (measurable) results could lead to undesirable side effects, such as a narrowing of the curriculum. The focus on literacy and numeracy, for example, may lead to deterioration of other subjects or a decreased attention to social and emotional development.

By taking the moderating function of managerial networking into account, the present study shows that the negative effect of performance management works differently in different subgroups of school principals. Specifically, the negative effect of performance management on performance is stronger for school principals who interact frequently with members of their boards. One explanation for the observed negative effect could lie in the principal–agent or hierarchically oriented nature of the relationship between the school board and the school. Although school boards often delegate much authority to the school principal, the school board is formally accountable for the internal organization, the personnel and employment policies, and the financial management of the school—and ultimately, for the school's performance (Turkenburg, 2008). This structure explains why school boards put a strong emphasis on monitoring and efficiency, which may result in over-control. Over-control, in turn, may result in the crowding out of resources from the primary production process.

To reduce potential bias produced by principals who were not school principals in 2010, we confined the analyses to school principals with at least three years of experience. To assess the robustness of our findings, we estimated a series of models without this confinement (n = 543; results available on request). The results of the additional analyses are comparable to the results presented here.

4.7 Conclusion

In this chapter, we focused on the conditions under which managerial networking with actors and organizations in the environment of the focal-organization moderates the effect of performance management on organizational performance. We analyzed both the direct and conditional effect of performance management on organizational performance. Based on the analysis, we can draw a number of conclusions.

For several decades, the *assumption* that *NPM* programs are successful in the public sector has been the rationale behind numerous public sector reforms (Hood, 1991; Moynihan, 2008; Van Dooren & Van de Walle, 2008; Boyne, 2010). However, our finding that performance management has a negative effect on organizational performance contradicts this common assumption. Therefore, improving the performance of public organizations does not simply

follow from the increased use of performance information. Our results suggest that in the context of Dutch primary education, 'performance-driven teaching' reform is a burden for the organization that does not advance the legitimate purpose that the reform was intended to serve. Hence, we should further assess whether performance management is a blessing or a form of "red tape."

Recent theoretical insights suggest that the effect of performance management is contingent on interactions with stakeholders (Moynihan & Hawes, 2012; Van de Walle & Van Dooren, 2010). Managerial networking with stakeholders is expected to provide public organizations with superior information about—among other things—macro- and organization-level goals, how to use and interpret performance information, and how to translate performance information into clear and feasible goals for subordinates, which can be used to boost performance management. Although our findings show that performance management has a negative effect on performance, based on these theoretical arguments, we would expect that managerial networking attenuates the negative effect of performance management on performance. We find that networking outward and networking downward do not affect the performance management-performance relation. However, upward-oriented managerial networking—that is, contact with the school board—reinforces the negative effect of performance management on performance. If we assume that contact with the school board signifies over-control, our results suggest that the school board encourages school principals to use more and more performance information tools, which ultimately results in poor performance.

One limitation of this study is that performance is measured using one performance indicator, while public organizations typically have more than one performance dimension (Hvidman & Anderson, 2013). The present study does not provide information concerning how performance management affects other dimensions of performance—such as efficiency, equity, and public satisfaction (Boyne, 2010; O'Toole & Meier, 2011)—nor does it examine "whether an improvement in effectiveness comes at the cost of other performance dimensions" (Hvidman & Anderson, 2013, p. 40). Future research should further tease out the effects of performance management on different dimensions of performance.

5

Transforming input into performance

This chapter is co-authored by Jelmer Schalk and René Torenvlied and is currently under review (submitted as: Van den Bekerom, P., Schalk, J. Torenvlied, R. Transforming input into outcome: how team involvement mediates the effect of managerial networking on organizational performance).

5.1 Introduction

Explaining the relationship between public management and public sector performance lies at the heart of current public management research (Boyne et al., 2006; Walker & Andrews, 2015). Much of the research departs from three broad theoretical perspectives on public sector management: "economic theories of service production, organizational contingency theories, and resource-based theories on production capabilities" (Walker & Andrews, 2015, p. 105). The three theoretical perspectives have their roots in "open systems theory" (Scott, 2003, p. 108), which specifies interactions with the environment as a factor for organizational success distinct from internal factors (Aldrich, 2008).

In open systems theory, organizations regulate technical flows between "input-," "throughput-," and "output" processes that are connected to the organizational environment (Katz & Kahn, 1978; Scott, 2003). Like all organizations, public organizations depend heavily on their external environment for survival. Interactions with the interdependent environment provides public organizations with the necessary information and resources to achieve their mission. Examples of these resources are people, money, technology, rules, and regulations. The "input" of these resources is jointly transformed, within the organization. This "throughput" process is affected by "adjusting the structures and processes of its internal components" (Hassard, 1995, p. 32). Examples of such structures and processes are organizational size, the division of tasks among units (Andrews, Beynon, & McDermott, 2015), or internal management practices—such as the traditional POSDCORB-like functions. The result of this transformation is the organizational "output": the products and services that follow from recurring and patterned activities that regulate the (technical) flows between input and output.

In order to successfully transform inputs into outputs, the technical flows between input, throughput, and output must be coordinated and integrated by the managerial system (Montouri, 2000; Scott, 2003; Amagoh, 2008). Public management research departs from this core assumption. Attempting to analyze all throughput related managerial activities would be an impossible task. Our approach is to focus on public managers' relations with various organizations and actors in the interdependent environment of their organization, that is, "managerial networking" (e.g. O'Toole & Meier, 1999; 2011). Although both external and internal management entail more than just interacting with actors in the environment of an organization, interactions are a necessary precondition for meaningful external and internal management (O'Toole, Meier, & Nicholson-Crotty, 2005; Meier & O'Toole, 2005).

Extant studies of managerial networking have predominantly focused on how public managers manipulate the 'input' from the interdependent environment of their organization to enhance organizational performance. Indeed, these studies clearly demonstrate that a positive effect exists of managerial networking on a wide range of perceptual and objective

performance indicators (e.g., Nicholson-Crotty & O'Toole, 2004; Goerdel, 2006; Leana & Pil, 2006; Meier, O'Toole, Boyne, & Walker, 2007; Meier, O'Toole, & Hicklin, 2010; Walker et al., 2010; Akkerman & Torenvlied, 2011; O'Toole & Meier, 2011).

Recent studies have probed into the multi-dimensional nature of managerial networking. The underlying idea is that, for specific purposes, managers work together with distinct types of actors in the environment of their organization (Moore, 1995). Indeed, recent studies show that substantively different networking dimensions exist and have a context-specific impact on performance (Torenvlied, Akkerman, Meier, & O'Toole, 2013; Meier et al., 2015; Van den Bekerom, Torenvlied, & Akkerman, 2015; 2016; Zhu, Robinson, & Torenvlied, 2015; Van der Heijden & Schalk 2016).

Despite the recent advances in contextualizing effects of managerial networking, the predominant focus of extant research is—in terms of the framework of "open systems theory"— on the relation between "inputs" and "outputs". Thus, current studies neglect how the constituting process of organizational "throughput" mediates between organizational "input" and "output". It is quite likely that characteristics of the throughput process mediate the production functions of public organizations, because a crucial task of public managers is to (re)allocate and disseminate (tangible and intangible) external resources within their organization in order to provide high quality public services. Thus, a crucial next step in current research on public management and performance is to study the "throughput-hypothesis," that is: the mediating relation of organizational throughput processes between the input from the environment (regulated and facilitated by external management) and organizational output (in terms of public service delivery).

This chapter presents the results of a first study that sheds more light on the "throughput hypothesis" of organizational performance. We examine how the managers of Dutch primary schools, that is, school principals, facilitate the throughput of resources and demands into performance. We aim to shed light on the 'throughput-hypothesis' with respect to one key aspect of internal management in the throughput process: team involvement. Team involvement—also referred to as downward networking (Van den Bekerom, Torenvlied, Akkerman 2015; 2016)—is defined as public managers' regular involvement of, and consultation with, subordinates such as street-level bureaucrats regarding a broad range of organizational matters (O'Toole, Torenvlied, Akkerman, & Meier, 2014). We conceptualize external management in terms of external managerial networking. Managerial networking combines the scope and the intensity of relations with actors and organizations in the environments of the organization.

Compared to Chapters 2, 3, and 4, in Chapter 5 we use a narrower definition of the school organization and, with this choice, a narrower definition of internal management. In Chapter 5 we use formal membership of the school—instead of the school board—to delineate the boundaries of the organization. The reason is that the substantive focus of Chapter 5 lies on

the primary production process of education—which is located within the school, specifically at the operational level at which teachers provide education for students. Key actors and stakeholders that are not part of the primary production process, such as the school board and peers, are therefore regarded as part of the school's 'external' environment.

By introducing and testing the "throughput hypothesis", we contribute to current research in public management and performance in two ways. In the first place, we take seriously the implications of Scott's (2003) open systems framework in the field of public management by examining whether team involvement mediates the effect of 'external' managerial networking on organizational performance. Moreover, we distinguish among "networking outward," "networking upward," and "networking sideward" (Moore, 1995; Van den Bekerom et al., 2015; 2016), which provide us with a more precise measurement of the managerial activities facilitating and regulating the technical flows within the organization. Extant studies typically use a one-dimensional networking activity index (e.g. Meier & O'Toole, 2001; Meier & O'Toole, 2003; Walker, O'Toole, & Meier, 2007).

Below, we first briefly discuss the context of Dutch primary education and then present a theoretical argument for the mediating effect of school directors' team involvement in the relation between directors' other managerial networking activities and school performance. Empirically, we test our propositions using data obtained from a field survey held in 2010 among Dutch public school principals, combined with objective, independently measured data of school performance data.

5.2 Research context: Dutch primary education[1]

In 2010 there were 6,848 primary schools that are responsible for the education of more than 1.5 million school students in the ages between four and 12 (Dutch Ministry of Education, Culture and Science, 2011). Dutch primary schools vary with respect to their educational philosophy or denomination. This variation developed from the principle of "freedom of education," which is embodied in the Dutch Constitution. Almost 70% of all primary schools in the Netherlands are denominational schools.

In the Netherlands, the executive oversight and administrative powers, such as the internal organization, the personnel and employment policies, and the financial management of the school—and ultimately for the school's performance, are assigned to the school board (Turkenburg, 2008). Despite their final accountability, most school boards delegate much authority and discretion to the school principal, that is, the public managers that are central to the present study.

1 An extensive discussion of the research context has been published in Torenvlied & Akkerman (2012) and Van den Bekerom et al., 2015). The present discussion focuses on context characteristics important for this study.

In practice, most school principals establish the school's educational curriculum; they coach teachers; develop plans for pedagogical quality, student care, and quality control; and monitor student performance. School principals also have considerable administrative duties associated with the day-to-day management of the school. They are responsible for the planning of activities, human resource management, and the development and maintenance of buildings. School principals are also the main representatives of the school in external contacts and therefore maintain relationships with organizations and actors in the school's environment. In the first place, primary school principals interact with national government organizations that are involved in the assignment of accountability to schools with respect to student achievements, educational climate, and financial management. The Inspectorate of Education, for example, assesses all schools on the same final attainment levels. Most prominent is the standardized Cito test which provides information about both students' progress and the school's performance. Schools that fail to comply with the performance standards are subjected to an intensive supervision regime and an annual evaluation (which is made public). Schools that that continue to fail ultimately risk losing their funding. In addition, school principals maintain contacts with other non-governmental organizations at the national level, such as interest groups who lobby with regard to (personnel) policies and regulations.

Secondly, local government—politicians and agencies—outlines the local conditions for the provision of education by deciding about the allocation of resources to school improvements, has control over schools buildings, and administers rules and regulations for public space and public safety. Although some standard contacts exist between schools and the local administration, school principals also partake in lobbying activities to yield local political support, for example for housing and safety issues.

Finally, education is a coproduced public service, and principals need active involvement by parents in the education of their children, as well as cooperation from teachers and other schools in their board to implement their goals. Also, each school has a mandatory advisory body of both parents and staff, who co-determine important educational and management issues together with school management and the school board.

5.3 Theoretical framework

5.3.1 Throughput in public organizations

Although all organizations are hierarchical to a certain extent, they are not "taut" systems. Organizations consist of sometimes loosely coupled elements, such as departments or divisions, capable of fairly autonomous action (Weick, 1976; Scott, 2003). The autonomous organizational actions must be organized, to some degree, by a manager (Weick, 1969). The perspective of organizations as open systems emphasizes the importance of the

organization's policy center, control center, operations, and flows among them (Scott, 2003, p. 86; Swinth, 1974). Effective managers facilitate flows of resources and information within their organization that contribute to strategic sense-making (Scott, 2003). Figure 1 presents these flows as an abbreviated version of Scott's model of organizations as cybernetic systems (2003, p. 86). The first of such technical flows in public service organizations are the goals and performance standards, set for the organization by a policy center, in response to demands, preferences, and orders from the organizational environment. The second flow is the transmission, by the policy center, of the goals and performance standards to a control center within the organization. A third technical flow consists of the information between the control center and the operational level—often formed comprised of (street-level) professionals and case workers. A fourth flow of resources and information enables managers to exploit the environment to obtain raw (input) materials. The third and fourth flows enables the operational level to establish a fifth flow: the transformation of input from the environment, such as raw materials, (monetary) resources, and people into products and services.

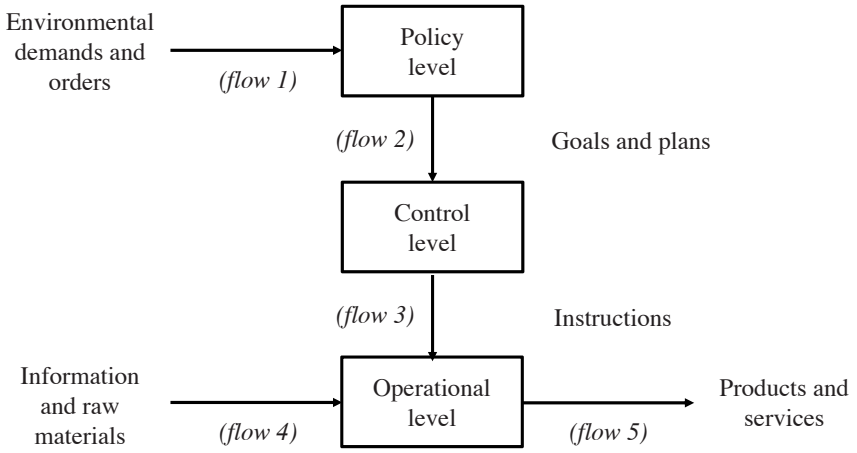

Figure 5.1 An organization's technical flows (based on Scott 2003, Figure 4-2, p. 86).

In the context of primary schools, and many other (smaller) public service organizations, functions at the policy level and the control level are often combined into the responsibilities of a high-ranked manager. School principals combine the two functions: they set goals and performance standards and communicate instructions to their teaching and support staff. Thus, school principals are boundary spanners between the school environment and their school. For example, school principals must be aware of (changing) benchmark levels for

arithmetic and language as set by government agencies. School principals have to translate these (changing) demands into specific goals, targets, and instructions for their school staff. They also need to facilitate information exchange between themselves and their staff at an operational level.

Below, we elaborate on how different managerial activities pertains to the different flows of Scott's (2003) open systems model. We first discuss flows 1 and 4 (external management) in terms of *managerial networking* (Meier & O'Toole, 2003) and then discuss flows 2, 3, and 5 (internal management) in terms of managers' *team involvement* activities (O'Toole et al., 2013) and their effect on performance. Next, we expand our conceptual model with theoretical arguments for the mediating effect of team involvement in the relation between managerial networking and public service performance.

5.3.2 Managerial networking

"Managerial networking is the set of relations that managers maintain with organizations and actors in the environment of their organization" and is conceptualized as the contact frequency of relations that (high-ranking) managers maintain with actors and organizations in the environment of the focal-organization (Torenvlied & Akkerman, 2014, p. 845). In terms of technical flows, managerial networking enables managers to set clear goals and performance standards for the organization in response to external constraints (flow 1) and helps organizations to exploit necessary resources (flow 4).

Managerial networking studies have clearly demonstrated a positive effect on a wide range of perceptual and objective performance indicators (for example, Meier & O'Toole, 2003; Nicholson-Crotty & O'Toole, 2004; Leana & Pil, 2006; Goerdel, 2006). Moreover, empirical evidence suggests that public managers' networking activities absorb the negative impact of environmental challenges on organizational performance (Ryu, 2015; Van den Bekerom et al., 2015; 2016). Empirical studies have so far however neglected to operationalize what exactly managers do within their organizations to 'digest' external influences.

5.3.3 Team involvement and performance

After translating external demands and preferences into organizational goals and performance standards (flow 1), public managers of relatively small public service organizations, such as Dutch primary schools, transmit the goals and performance standards to the operational level (flow 2), and facilitate information flows between themselves and the operational level, which enables the operational level to transforms resources into outcomes, and ultimately performance (flow 5).

Public administration research traditionally focuses on the question of how hierarchical governance arrangements and formal structures of authority affect performance (Hill & Lynn, 2005, p. 566; Walker & Andrews, 2015). In addition to structural characteristics, open systems

theories recognize that human factors play a crucial role in organizational goal achievement (Scott, 2003). Simon's influential work (1997), moreover, spawned great interest in HRM, emphasizing the importance of worker participation in decision making, and its effect on work motivation, productivity, and performance (O'Toole et al., 2014; Rainey, 2009). The nature of the environment of public organizations, such as goal ambiguity, value pluralism, dynamic policy processes (Chun & Rainey, 2006; Perry & Porter, 1982; Rainey, 2009) and the high degree of autonomy of public sector professionals (Lipsky, 1980) reduce the ability of public managers to steer employee behavior through hierarchical management. Public managers operate more as a 'peers,' offering support and training to subordinates, than as a boss (Brehm & Gates, 1997).

Theoretically, Kadushin (1992) identifies the '*education*' of frontline workers by supervisors –in terms of goal setting, learning, and providing feedback–and managerial '*support*', which builds employee trust and reduces stress, as key team involvement mechanisms that increase performance. Favero et al. (2014) have offered an extended framework for how managers' personal interactions with subordinates affect performance. They build on four managerial activities: (a) setting clear and feasible goals, (b) stimulating trust and legitimacy, (c) increasing participation of employees in the decision making process, and (d) providing constructive feedback. These activities provide managers with better information to make decisions, increase employee learning, motivation, and goal adoption.

A study on Dutch primary schools, based on the same data as the present study, indeed shows that in Dutch primary schools team involvement is strongly, and positively, associated with students' average scores on standardized tests (O'Toole et al., 2014). Involvement of frontline officers in the decisions and day-to-day management of the organization has also been shown to be a critical determinant of performance in other studies (Maynard-Moody & Musheno, 2003).

5.3.4 Linking the environment to performance through team involvement

From the human relations approach to public organizations it follows that the dissemination process of demands, preferences, and orders from the organizational environment, takes place through team involvement. Indeed, research into middle management in professional bureaucracies shows that middle managers who score high on boundary spanning activities exercise stronger influence on their internal work environments than those that do not (Pappas, Flaherty, & Wooldridge, 2004). This may work through increasing trust and commitment, setting clear and feasible goals, increasing participation of employees in the decision making process, and providing constructive feedback (Favero et al., 2014). We may expect that different orientations of 'external' managerial networking to affect specific demands for team involvement differently. Recent empirical advancements in the measurement of managerial networking have shown that public managers differentiate their contacts with different types

of stakeholder groups, in order to achieve different goals (Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015). In line with results from these studies, the present study distinguishes between three fundamental 'external' networking orientations: "outward," "upward," and "sideward" (Moore, 1995; O'Toole et al., 2005; Van den Bekerom et al., 2015; 2016).

Networking outward. Networking outward refers to managers' interactions with actors such as local and national government organizations as well as interest groups in the labor domain. In order to be able to set clear goals for employees, public managers must rely on the broader political context within which services are provided by the organization. In the context of Dutch primary schools, public goals, performance criteria for schools and students, and school funding based on the attainment of performance criteria are defined through national and local decision making, including standards for safety, access, or transportation. In order to motivate employees, gaining their trust and commitment, public managers invest in relationships with labor interest group actors that offer support in terms of conflict mitigation and providing means for personal development of employees. This mediation is essentially a two-way process: stronger team involvement means that a public manager is more aware of tacit employee preferences and can translate these more accurately into demands for external stakeholders, as well as the other way around (Paulsen, 2014).

Thus, outward-oriented networking towards national and local government as well as labor interest groups may affect performance through setting clear goals for employees as well as increasing trust and commitment. In order to communicate these goals and increase trust and commitment, school principals need to involve subordinates and consult them on a regular basis. This leads us to our first hypothesis:

> **Hypothesis 5.1**: School principals' intensity of outward-oriented managerial networking positively affects organizational performance through increased team involvement.

Networking upward. Networking upward refers to meetings with, and reporting to, superiors (for example, political principals), which have direct hierarchical leverage over public managers. Whereas networking with policy makers in the organizational environment informs school principals about general and long term regulations, principals also have to deal with short term organizational objectives set by school boards. These concrete and short term objectives concern, for example, the required implementation of ICT programs. Moreover, contact with the school board might convince the board to grant more autonomy (O'Toole & Meier, 2011), which, in turn, might increase participation of employees in the decision making process. Hence, a plausible assumption is that support from hierarchically superior principals is mostly related to performance through setting clear goals for employees

and increasing participation in the decision-making process. In order to communicate these goals and increase participations, school principals need to involve subordinates and consult them on a regular basis. This results in the second hypothesis[2]:

> **Hypothesis 5.2**: School principals' intensity of upward-oriented managerial networking positively affects organizational performance through increased team involvement.

Networking sideward. Networking sideward refers to horizontal co-production activities with stakeholders, necessary for the effective implementation of organizational strategies and programs. Apart from goal setting, managers must make decisions about which service delivery programs they may employ within the boundaries set by principals and politicians. To the extent that managers maintain more and stronger relations with external stakeholders, they have a better judgment of which information might impact on the functioning of a team, and which information (content) should be passed on in which way (framing of a message). In the context of teaching, this may for example concern finding effective teaching methods, accommodating the needs of clients, as well as parent concerns. These issues mainly have to do with changing the content of actual service delivery practices and accommodating client concerns. In the context of schools for example, research consistently shows that teachers wish to be 'shielded' from parental and other forms of direct external pressure (DiPaolo & Tschannen-Moran, 2005). This type of information is obtained primarily through networking directly with co-producers: client representatives and 'peers' from other primary schools. We expect managerial networking with these co-producers to affect performance mainly through feedback. For example, when a public manager obtains information from other school managers on effective new teaching methods, feedback from employees may inform managers about how best to customize these methods for implementation in their particular organization. In order to provide subordinates with feedback, school principals need to involve subordinates and consult them on a regular basis. This leads us to our third hypothesis:

> **Hypothesis 5.3**: School principals' intensity of sideward-oriented managerial networking positively affects organizational performance through increased team involvement.

The mechanisms presented above are based on the most likely theoretical arguments.

2 It is also possible that because of the principal-agent nature of the relationship between the school board and the school principals, high levels of networking upward are a result of over-control instead of discretion. Over-control could result in burdensome rules and regulations that do not benefit—or even deteriorate—school performance. If so, contact with the school board should still positively affect team involvement because additional rules and regulations also have to be communicated to subordinates. However, the indirect effect on performance should be insignificant or negative.

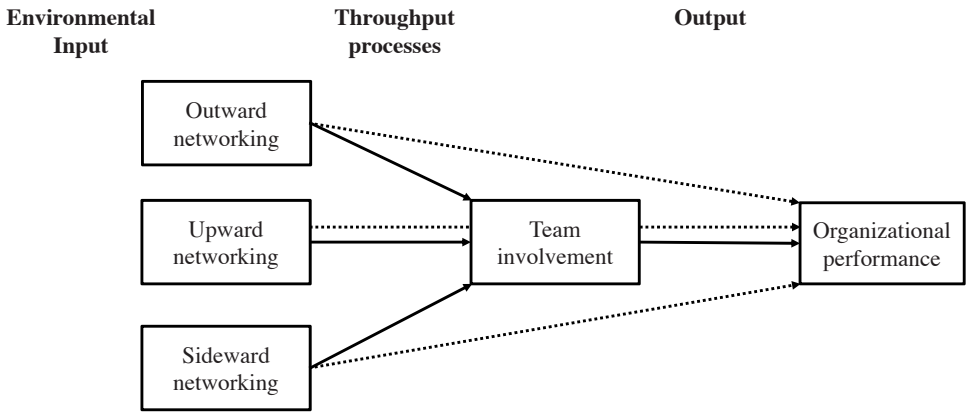

Figure 5.2 Conceptual model: How management facilitates the educational production function.

Arguably, for each distinguished type of actor, networking may also affect other types of managerial action. Moreover, apart from a mediation effect, the direct effects of networking outward, upward, and sideward on performance can also be expected to exist (Goerdel, 2006; O'Toole et al., 2005; Torenvlied et al., 2013). That is, obtaining information and resources from these partners may have a positive effect on performance through other means than team involvement. Hence, in our empirical model, we also include these effects. Figure 5.2 summarizes our conceptual model.

5.4 Research design[3]

5.4.1 Data collection

To test our hypotheses, we use a data set of 547 school principals, after a listwise deletion of respondents who have missing values on the variables used in the analyses. The data set was constructed by integrating three data sets of primary schools. The first data set contains information from a nation-wide internet survey of principals of Dutch primary schools in January 2010. The survey focused on the internal and external managerial activities in the previous calendar year (where the school year starts late August and ends early July). Principals of all 6,896 Dutch primary schools were invited both by mail and email to participate in the survey. Reminders were sent after two weeks. After six weeks, the response rate was 19.55% (n = 1,348). This rate is comparable to response rates reported by other studies of Dutch school principals, and is substantial given the work pressure on school principals and the prevalence

3 Other recently published studies that use the same data set, but focused on different topics, have a somewhat comparable research design (Torenvlied & Akkerman, 2012; Van den Bekerom et al., 2015; 2016).

of survey research in this sector.[4] [5]

The second data set is a data set from the Dutch Inspectorate of Education, which provides information about indicators of school performance. A third data set, obtained from the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency), provides information about student characteristics and school boards. The three data sets were matched by each school's unique identification number, assigned by the Dutch Ministry of Education, Culture and Science—a four digit code which allows the ministry to identify primary schools as separate educational units within school boards. Below we discuss the construction of the different measures in the analysis.

5.4.2 Measures

School performance. The dependent variable in the present study is the school's average score of students on a standardized test for 2009 and 2010, that is taken in the second half of the eighth and final grade of primary education. Approximately 75% of all primary schools participate voluntarily in this Cito test—which is named after the independent institute that develops, supplies, and administers the scores. The Cito test score is based on three sub-tests: language (100 questions), arithmetic (60 questions), and study competences (40 questions). Students' scores on these 200 questions are transformed on a scale between 501 and 550. Schools are allowed to exempt specific, well-defined categories of students from the test: students with severe language problems who live in the Netherlands for a period shorter than four years, students with an indication for special education, or students with an indication for vocational secondary education. Despite this room for discretion, the Cito test score is considered to be authoritative by the Dutch Inspectorate of Education, as well as by most teachers and parents. Students' referrals to specific levels of secondary education are based to a large extent on their Cito test scores.

Networking orientations. Managerial networking is conceptualized as networking upward, outward, and sideward. We follow O'Toole and Meier's (2011) measurement of managerial networking as captured by the frequency of interactions with actors in the organization's environment. We approached a number of key informants from the educational domain, such as school principals, school board members, members from the Primary Education Council, and the Dutch Inspectorate of Education. These informants provided us with a list of potential types of actors and organizations in the environmental of the school: (a) organizations at

4 For example, the web-based survey of the Dutch Education Council (2008, p. 31) had a response of 15.6%.

5 A non-response analysis shows that schools in the analysis do not differ with respect to certain critical characteristics, namely: outcome assessment by the Inspectorate of Education, the percentage disadvantaged students and educational vision (see Table A4 in the Appendix). However, larger schools and schools with a Roman Catholic denomination are slightly overrepresented.

different levels of the educational system (for example, the national, regional, local, and school-board levels) and (b) organizations with different functions in the educational system as broadly described in the research context section. This procedure resulted in a list of forty one different types of organizations and actors. We subsequently asked the school principals about their frequency of interaction with each of these organizations, using the categories "daily," "weekly," "monthly," "several times per year," "yearly," and "never."

To test the internal consistency of the four managerial networking dimensions, we use Mokken scale analysis (MSA), which is a non-parametric variant of item-response theory (Mokken, 1971; also see Torenvlied et al., 2013; Zhu et al., 2015 for applications on managerial networking variables). The Mokken model assumes that an item can be included only once in a scale, whereas factor analysis assumes that items can contribute to several latent factors. When using MSA, a participant's scale score is therefore the sum of her scores on each item in the scale (Torenvlied et al., 2013). For all dimensions, we computed a sum scale that was standardized with respect to the number of items in the scale. All scales have a homogeneity H between 0.30 and 0.50, that is acceptable (Van Schuur, 2003).

To measure networking outward we use three variables: *national government networking*, *local government networking*, and *interest group networking*. National government networking includes to following organizations: (a) the "DUO," which is the semi-autonomous government agency responsible for budgeting and finance, (b) the Dutch "Ministry of Education, Culture, and Science," which is the national government department responsible for formulating educational policies and programs, (c) "test suppliers," which are corporations that develop standardized tests for primary education, (d) the autonomous "Inspectorate of Education," which is responsible for monitoring school performance and auditing the schools on a wide variety of performance indicators. The four networking frequency items together form a scale with intermediate strength ($H = 0.46$).

Local government actors and organizations are: (a) "members of city council," who are the representatives in the local political arena, (b) "aldermen," who are the chief administrators in the local government, and (c) the "municipal department of education," which is the main local government department responsible for implementing education policies in the local domain. The combined items on local networking activity form a strong scale ($H = 0.51$).

Interest organizations in the labor relations domain are: (a) "labor unions," which are the labor unions for teaching and support staff, (b) "employer organizations," which are organizations that represent the interests of school principals, and (c) "the Primary Education Council," which is the employers' organization for school boards in primary education. The combined items on interest organization networking form an intermediate strong scale ($H = 0.42$).

Networking upward is measured by the single-item variable that captures the school principals' *contact with the school board*, which is the self-reported interaction frequency of

the school principal with the school board.

Finally, networking sideward is conceptualized as *co-production networking*. The contact frequency items are: (a) "the parent committee," (b) "the participatory council," and (c) "principals of schools that are part of your school board." The frequency variables for these three items form a co-production networking scale (H = .38).

Team involvement. Team involvement is captured by ten items concerning the school principal's' interaction frequency with the staff concerning several issues: (a) "school identity and external communication," (b) "school housing and maintenance," (c) "financial affairs," (d) "personnel and employment policy," (e) "quality of education," (f) "student results and performance monitoring," (g) "student care," (h) "educational quality," (i) "external relations," and (j) "scheduling and other practicalities."[6] The same response options that are used in the conventional measurement of managerial networking were used for the responses. The items form a scale with high internal consistency (H = 0.40).

Controls. We use a select number of control variables. First, we control for the increased challenges associated with educating disadvantaged students. The variable *percentage disadvantaged students* taps the percentage of students who carry a "student weight," indicating that the student needs additional support and resources.[7] We control for the percentage disadvantaged students for t = 2009 and t = 2010. The variable *denomination* measures whether a school is a non-denominational school (=1) or a denominational school (=0). Furthermore, we include a measure that controls for confounding effects that may arise from a crucial potential difference between school principals: their work engagement and experience. To measure *work engagement*, we use the "Utrecht Work Engagement Scale-9" (UWES-9) (Schaufeli, Bakker, & Salanova, 2006). Nine items capture vigor, meaningfulness, enthusiasm, and well-being, among others. *Experience* is captured by the number of years that the school principal has worked as head of this specific school. The items form a scale with high internal consistency (Cronbach's alpha = 0.93). We also control for the size of the school board, which is measured as the *number of schools* that are governed by the school board. Finally, in line with early Texas school district studies, we test an *autoregressive* model by including the lagged dependent variable *Cito test scores 2008*.

Table 5.1 presents the descriptive statistics and correlations between the variables in the analysis. Because Cito test scores and percentage disadvantaged pupils are nested within

6 These aspects were also derived on the basis of in-depth interviews with school principals, board members, and representatives from the Inspectorate of Education.

7 The percentage of disadvantaged students is based on the so-called "student weights", relating to student conditions such as when both parents have only attended elementary school, or whether a student lives in a foster home These weights used to calculate the additional funding for disadvantaged students.

Table 5.1 Descriptive statistics and correlations for all variables in the analysis (n = 547)

	Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12
1	Average Cito test scores	535.346	4.091	518.10	545.00	1.000											
2	Team involvement	2.403	.553	.80	4.20	.072*	1.000										
3	National government networking	2.445	.601	1.00	4.50	.008	.233*	1.000									
4	Local government networking	2.125	.717	1.00	4.67	-.013	.188*	.258*	1.000								
5	Interest group networking	1.924	.774	1.00	4.67	-.003	.136*	.484*	.253*	1.000							
6	Contact with school board	3.794	1.348	1.00	6.00	.014	.189*	.138*	.196*	.171*	1.000						
7	Co-production networking	4.052	.674	1.33	6.00	-.061*	.229*	.120*	.159*	.052*	.083*	1.000					
8	Work engagement	4.243	.862	1.44	6.00	.030*	.017	.018	.072*	.132*	.084*	.075*	1.000				
9	Work experience	7.967	8.147	.00	40.50	.093*	.018	.030*	.100*	-.049*	-.044*	.023	-.087*	1.000			
10	% Disadvantaged students	13.647	14.500	.00	78.31	-.612*	-.068*	-.044*	.066*	-.070*	.046*	.033*	.058*	-.090*	1.000		
11	Denomination (non-denominational = 1) †	.287	.453	.00	1.00	-.149*	.054*	-.008	.079*	-.131*	-.057*	.210*	-.045*	.010	.134*	1.000	
12	Number of schools board	16.005	12.780	1.00	64.00	-.154*	.025	-.042*	-.008	-.095*	.127*	.210*	.103*	-.032*	.178*	.133*	1.000
13	Lagged average Cito test scores	535.021	4.403	519.30	545.40	.621*	-.013	.017	-.056*	.020	-.076*	-.078*	.005	.066*	-.502*	-.146*	-.122*

* $p<0.05$

schools over time, we use the mean values of these variables to compute the correlations with all other variables. The results show that there is a very weak positive correlation between Cito test scores and team involvement. There are weak correlations between team involvement and the networking scales. There are very weak correlations between performance management and the networking scales. Other weak to moderate correlations exist between the outward, upward, and sideward networking variables.

5.4.3 Common method bias

When using self-reported measures, concerns about common method bias arise (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Although there are several techniques for the post hoc statistical control of common method bias, several scholars have argued that these techniques are ineffective (e.g. Richardson, Simmering, & Sturman, 2009; Conway & Lance, 2010; Favero & Bullock, 2014). In the present study, several pro-active safeguards have been built in to reduce the likelihood of common method bias. First, school performance is measured using objective school performance data that were measured independently from the survey (Meier & O'Toole, 2013; Favero & Bullock, 2014). In addition, there is no substantive overlap between the items that are used to measure the different constructs (Conway & Lance, 2010). Moreover, the separate sections of the survey were clearly labelled (Brannick et al., 2010) and we made it very clear to the respondents that we would protect their anonymity (Podsakoff et al., 2003).

As a post-hoc check, a single factor test is used to check whether variance in the data can be largely attributed to a single factor (DiStefano & Hess, 2005). We performed two confirmatory factor analyses (CFA) : 1) a model where all management items (except contact with the school board) load on one factor, and 2) a model where we test whether the data fit the hypothesized measurement model (also excluding contact with the school board). To test the fit of both CFA models we used the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR) (Barrett, 2007; Kline, 2010). The five-factor model fits the data much better than the one-factor model (CFI = 0.870; TLI = 0.851; RMSEA = 0.057; SRMR = 0.050 and CFI = 0.534; TLI = 0.478; RMSEA = 0.106; SRMR = 0.100, respectively), which demonstrates construct validity of the measures used in the analysis.

5.4.4 Analytical strategy

In the conceptual model (see Figure 5.2), the path between upward, sideward, and outward managerial networking and organizational performance is mediated by team involvement. To test these indirect effects, we use Preacher and Hayes's (2004) approach for testing mediation. An indirect effect is the sum over all paths from the independent variable to the dependent variable of the product of the associated unstandardized path coefficients (Sobel, 1982). In

this case, it is the product of the path coefficient between a networking dimension and team involvement, and the coefficient between team involvement and Cito test scores. Because the variables Cito test scores and percentage disadvantaged students are nested within schools the errors are allowed to be correlated within clusters (schools).

According to MacKinnon et al. (2007) there are two essential steps in establishing mediation. The first step is to show that there is a significant effect of the independent variable on the mediator variable. The second step is to show that the mediator significantly affects the outcome variable. Once the regression coefficients are calculated, the indirect effect needs to be tested for significance. Following Preacher and Hayes (2004), bootstrapping (5000 iterations) is used to test the significance of the indirect effect. Below the formula for an indirect effect is presented (Preacher & Hayes, 2004):

$$m = a_0 + a_1 x$$
$$y = b_0 + b_1 m + b_2 x$$

where 'm' is the mediator variable; 'x' is the independent variable; 'y' is the dependent variable; and, 'a_0' to 'a_1' as well as 'b_0' to 'b_2' are estimable parameters. This model is just-identified—meaning that there are as many knows as unknowns in the equation.

Structural equation modeling (SEM) was used to test the hypotheses. In this chapter, we modeled direct paths to all endogenous variables (Williams, Vandenberg, & Edwards, 2009). Because we use MSA to test the internal consistency of measurement scales, we test our model using composite scores of the measurement scales as single indicators of their corresponding latent variable.

The SEM model of the present study specifies two types of parameters: directional effects, and variances. The directional effects, or path coefficients, represent the relationships between the independent and dependent variables in the model. The arrow from national government networking to team involvement is an example of such a directional effect. The variances (e) denote the unexplained variance in the dependent variables (team involvement and Cito test scores 2010). Because our model is just-identified—that is, a model with zero degrees of freedom—parameters can be estimated, but it is not possible to test the model's goodness of fit (cf. Byrne, 2010; Kline, 2011).

Table 5.2 Structural model of average Cito test scores: direct effects (standardized coefficients; *n* = 547)

	b	s.e.
Dep.Var. = Cito test scores 2010		
Team involvement	.047+	.028
National government networking	-.010	.031
Local government networking	.031	.029
Interest group networking	-.064+	.035
Contact with school board	.057+	.030
Co-production networking	-.019	.027
Work engagement	.051	.028
Work experience	.025	.027
% Disadvantaged students	-.348***	.033
Non-denominational school	-.032	.027
Number of schools board	-.041	.026
CitoLagged average Cito test scores	.371***	.032
Year=2010	.064**	.020
Constant	130.162***	3.026
Dep.Var. = Team involvement		
National government networking	.166**	.050
Local government networking	.094*	.042
Interest group networking	-.005	.049
Contact with school board	.137**	.040
Co-production networking	.182***	.044
Work engagement	-.008	.041
Work experience	-.005	.043
% Disadvantaged students	-.096*	.041
Non-denominational school†	.028	.044
Number of schools board	-.014	.043
Lagged average Cito test scores	-.032	.049
Year=2010	.000	.002
Constant	-.002	.047
e.Cito test scores 2010	.587	.025
e.team involvement	.869	.027

Note. † reference category is denominational schools; all explanatory variables except dichotomous variables are grand-mean centered; errors are allowed to be correlated within clusters (schools).
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

5.5 Results

Table 5.2 provides the hypothesized parameter estimates for the structural model as standardized regression weights. Consistent with our expectations, we find that the mediator team involvement has a positive, and significant, effect on Cito test scores. Moreover, the results show that national government networking, local government networking, contact with the school board, and co-production networking all significantly increase team involvement. Interest group networking does not have a significant effect. Hence, the conditions for testing for mediation are met for national government networking, local government networking, contact with the school board, and co-production networking. Interest group networking has a significant negative direct effect on Cito test scores, whereas contact with the school board has a significant positive direct effect on Cito-test scores. The unexplained variance of Cito test scores and team involvement are 0.587 and 0.869, respectively.[8]

Although Table 5.2 illustrates several direct relationships, it does not provide information about the indirect effects of the five 'external' managerial networking variables on Cito test scores. Bootstrapping (N=5000) is used to test whether the indirect effects of the five 'external' managerial networking variables are significant. Table 5.3 presents the bootstrapped indirect effects on Cito test scores. The confidence intervals for the variables national government networking, contact with the school board, and co-production networking do not include zero, meaning that the indirect effects are indeed statistically significant. The indirect effects of local government networking and interest group networking is not significant. Hence, team involvement mediates the effect of principals' networking activities with national government organizations, the school board, and co-producers on performance.

Table 5.3 Bootstrapping indirect effects of managerial networking on average Cito test scores via team involvement (n = 547).

	B	Bootstrap S.E.	LL BCA	UL BCA
National government networking	.053	.038	.001	.123
Local government networking	.025	.021	-.0002	.064
Interest group networking	-.001	.014	-.027	.020
Contact with the school board	.020	.014	.00001	.044
Co-production networking	.052	.035	.0002	.113

Note. N = 5000 Bootstrapping resamples; LL BCA and UL BCA = Lower level and Upper level of the bias corrected and accelerated confidence interval for α = .10; all equations control for work engagement, work experience, percentage disadvantaged students, past performance, non-denominational schools, and board size; all explanatory variables except dichotomous variables are grand-mean centered; errors are allowed to be correlated within clusters (schools).

8 We tested for endogeneity using the Hausman test (Antonakis, Bendahan, Jacquart, & Lalive, 2010) and the results show that the unexplained variance of Cito test scores and team involvement are not correlated. Hence, this indicates that there is no uncontrolled confounder causing both Cito test scores and team involvement.

What these findings demonstrate is that Hypothesis 5.1 (outward-oriented networking) is partly corroborated, namely for national government networking, and that Hypotheses 5.2 (upward-oriented networking) and 5.3 (sideward-oriented networking) are fully corroborated. Overall, the findings indicate that team involvement mediates the effect of managerial networking on organizational performance. However, it can also be argued that— rather than team involvement explaining the relation between managerial networking and performance— managerial networking affects the direction and/or strength of the relation between team involvement and performance. To test the robustness of our theoretical model, we also tested the moderating effect of the five networking dimensions on the relation between team involvement and performance. We constructed five variables interacting the outward, upward, and sideward networking with team involvement. The outcomes of these additional analyses show that there is no significant difference of the effect of team involvement on school performance between managers with higher levels of managerial networking and managers with lower levels of managerial networking (results not presented but available on request). Hence, the effect of team involvement on school performance is insensitive to different levels of school principals' networking activities.

5.6 Conclusion and discussion

This chapter aimed to shed light on how management facilitates the technical flows that transform resources and demands into output, which ultimately affects the organization's outcome. The results from the analyses indeed provide evidence for our 'throughput-hypothesis'. The outcomes indicate that public managers' regular involvement of, and consultation with, street-level bureaucrats regarding a broad range of organizational matters mediates the relation between outward, upward, and sideward-oriented managerial networking and organizational performance. Specifically, in the context of Dutch primary education, school principals' instensity of networking with national government organizations, the school board, and co-producers, is mediated through principals' increased team involvement efforts. Our findings confirm and important assumption of the open systems perspective, namely that internal management facilitates the technical flows that transform resources and environmental demands and preferences into output, and subsequently outcome (Weick, 1969; Scott, 2003). The mediating effect of internal management, to our knowledge, has not been empirically tested previously, or at least has not been given attention in the contemporary literature on public sector performance. Hence, the present study is a first step toward a comprehensive understanding of how external management indirectly affects performance.

To test the generalizability of these findings, this research should be extended to other contexts. Moreover, there are a number of limitations of the present study that point toward

directions for future research. First, compelling arguments can be made for a reversed link between team involvement and upward, sideward, and outward managerial networking. It is not unlikely that higher levels of team involvement increase the need for 'external' managerial networking. For example, if a school teacher is a poor performer, the need for contact with labor unions may increase. In the present study, we attempted to deal with the issue of reversed causality by using longitudinal data on school performance as well as controlling for past performance. To rule out as much alternative causal explanations for the throughput function of internal management, future quantitative research on performance management should use panel data for both management and organizational performance.

In addition, future research should also focus on how an organization's structural characteristics—such as the supportive infrastructure, techniques, and programs—facilitate the technical flows that transform resources and demands into outcome. Moreover, rather than attempting to analyze the all aspects of internal management, we conceptualized internal management as public managers' team involvement activities (cf. O'Toole et al., 2014). Future research should further tease out the throughput function of other expressions of internal management.

The results of this study should urge public managers to take their "sense-making" activities seriously. In other words, public managers have to make sense of the information they receive from the environment, and, subsequently, pass this transformed information on to their subordinates. Public managers need to think carefully about their strategic investments in external management in relation to internal management strategies.

6

Conclusions

6.1 Introduction

The main question of this dissertation concerns the conditions under which public managers' interactions with external and internal actors and organizations in the environments of their organizations contribute to organizational performance. This chapter reflects on the results of the previous chapters by connecting them to the dissertation's research questions. We present the main conclusions, contributions, and limitations of the research, as well as suggestions and recommendations for future research. Below, we briefly recapitulate the theoretical background and the main research question of this dissertation.

6.1.1 Managerial networking and organizational performance

The dissertation's core assumption is that public managers' networking activities with actors and organizations in the organization's environment positively affect organizational performance. Public organizations are responsible for delivering and providing public services on which citizens rely (for example, the provision of education, waste management, water supply, law enforcement, and social services). The standards and criteria for these public services are determined by political actors in the public organization's environment. Consequently, public organizations are held accountable for achieving these standards, that is, the performance of their organization.

The organizational environment consists of individuals, organizations, institutions, and events that have the potential to affect the activities or outcomes of the organization (Pfeffer & Salancik, 2003). The environment of an organization can roughly be divided into the external environment and the internal environment (Davidson & Griffin, 2006). To maintain the quality of or improve services and goods, organizations depend on the stability of several internal elements, including a well-functioning technical system (Goodman, & Sproull, 1990), organizational participants (Simon, 1997), and appropriate (formal and informal) organizational structures (Weber, 1947; Blau & Scott, 1962; Simon, 1997).

However, no organization is self-sufficient. Thus, an organization must exploit resources, such as people, money, information, services, and technology, from the external environment to warrant survival and achieve its performance standards (Katz & Kahn, 1978; Pfeffer & Salancik, 2003). Conceptually, there are two general ways in which the external environment affects the functioning of organizations: (a) by providing the organization with *resources*, such as monetary resources, raw materials, human activity, knowledge, influence, power, and reputation, and (b) by imposing *constraints* that restrict organizational behavior, such as legal requirements, social requirements and expectations, and technological developments (Pfeffer & Salancik, 2003; Scott, 2003; Aldrich, 2008). Environmental elements have the potential to change in unpredictable ways (Boyne & Meier, 2009; Pfeffer & Salancik, 2003), so managing these potentially highly turbulent changes is a crucial issue for public organizations.

To attain a predictable and controllable flow of resources and constraints, public managers must interact with a wide array of different organizations and actors in the organization's environment that are potential sources of support (Meier & O'Toole, 2003). Examples of support include the provision of funds, information, staff, and advice (Meier & O'Toole, 2003; Torenvlied & Akkerman, 2014). In the public management literature, the relations that public managers maintain with various organizations and actors in the environments of their organizations are often referred to as *managerial networking* (O'Toole & Meier, 1999; 2011; Meier & O'Toole, 2003). Managerial networking is defined as the relational behavior of managers and combines the *scope* and the *intensity* of relations with actors and organizations, such as suppliers, stakeholders, co-producers, political principals and superiors, clients, alliance partners, regulatory agencies, or political institutions (Torenvlied & Akkerman, 2014, p. 845).

Public managers' networking activities with actors and organizations in the external environment of the focal organization are expected to contribute to organizational performance by (a) *exploiting* the environment and (b) *buffering* against environmental turbulence (O'Toole & Meier, 1999; 2011; Geletkanycz, Brian, Boyd, & Finkelstein, 2001; Pfeffer & Salancik, 2003). First, by exploiting the external environment, public managers provide the organization with resources and information about constraints that are necessary for the production of products and services (Scott, 2003). Second, networking with actors and organizations in the organization's external environment can also serve as a buffer to help organizations survive and absorb the negative effects of environmental turbulence, such as sudden budget cuts, abrupt changes in client characteristics, or drastic changes in existing rules and regulations. By maintaining relations with external organizations and actors, organizations can, if needed, mobilize resources and information that they need in times of turbulence.

For the external resources that are obtained through public managers' external networking activities to affect the organization's performance, public managers must also manage the internal environments of their organizations. By undertaking hands-on activities in order to organize and coordinate people, technologies, and the organizational structure, public managers aim to effectuate organizational stability, which is necessary for the transformation of environmental inputs into the delivery and provision of public services and goods. In the present study, internal management is conceptualized as the interactions between public managers and actors within or in close proximity to the organization, such as the board and subordinates. Although internal management entails more than just interacting with actors in the internal environment, interactions are a necessary precondition for meaningful internal management (O'Toole, Meier, & Nicholson-Crotty, 2005).

6.1.2 Aims, objectives, and overall research questions

The main aim of this dissertation is to gain additional insights into how public managers' interactions with organizations and actors in the internal and external environments of their organizations contribute to organizational performance. After a careful review of both the theory and previous empirical research related to the managerial networking and performance relationship (in Chapter 1), we identified some important theoretical and empirical limitations of the existing literature on managerial networking. Based on these limitations, we formulated four objectives.

Our first objective is to gain further insights into the consequences of the *multi-dimensional nature* of managerial networking for our understanding of organizational performance. It has long been known that different partners bring different benefits to an organization (Moore, 1995; Bozeman, 1987; Rainey & Steinbauer, 1999; Lynn, 2007; Moynihan & Pandey, 2005; Torenvlied & Akkerman, 2012). However, most public management research neglects the question of how particular networking dimensions provide specific types of resources that may affect organizational performance in unique ways. Instead, the majority of studies on managerial networking use an overall managerial networking index. Because managerial networking consumes valuable time and efforts, insights into the benefits of specific managerial networking dimensions is of great theoretical and practical relevance. Thus, we build on studies that challenge the one-dimensional nature of networking by exploring the consequences of the multidimensional nature of managerial networking (Akkerman, Torenvlied, & Van den Bekerom, 2010; Torenvlied, Akkerman, Meier, & O'Toole, 2013; Zhu, Robinson, & Torenvlied, 2015).

Second, we want to shed more light on the *conditional effect* of managerial networking. Current theoretical insights posit that managerial networking both attenuates the negative effect of environmental turbulence and reinforces the effect of other management activities. However, we currently lack empirical evidence concerning whether public managers can actually buffer the negative effect of environmental turbulence by networking with external organizations and actors. In addition, little is known concerning whether managerial networking also allows managers to leverage more organizational benefits from other management activities, such as human resource management, financial management, or performance management.

Third, we take into account the *indirect effect* of managerial networking on performance. For external resources that are obtained through networking with actors and organizations in the external environment to affect an organization's performance, public managers must coordinate people and resources within the organization. To date, existing studies have neglected to examine whether public managers' external management activities indeed affect the internal management activities that facilitate the transformation of the obtained resources and information.

Fourth, we want to test the managerial networking-performance relationship in a relatively *new context*, that is, Dutch primary education. Managerial networking theory is expected to be generalizable across settings (O'Toole & Meier, 2011). However, the majority of studies of the effect of managerial networking on performance have been conducted in the United States, specifically in Texas school districts. To assess the external validity of the managerial networking-performance hypothesis, managerial networking theory should be tested in other contexts.

Based on these objectives, we set out to answer the following overall research question:

- *Research question:* Under what conditions do specific managerial networking dimensions affect public sector performance in Dutch primary education?

To answer this overall research question, we address four secondary research questions:

- *SRQ1*: To what extent can we distinguish multiple dimensions of managerial networking in the context of Dutch primary education?
- *SRQ2*: To what extent do different dimensions of managerial networking moderate the effect of environmental challenges on public sector performance in Dutch primary education?
- *SRQ3*: To what extent do different dimensions of managerial networking moderate the effect of other management activities on public sector performance in Dutch primary education?
- *SRQ4*: To what extent are the effects of the different dimensions of managerial networking on public sector performance in Dutch primary education mediated by intermediary variables that precede performance?

6.1.3 Overview of the empirical chapters

The first step in answering our overall research question is to examine the extent to which multiple dimensions of managerial networking can be distinguished (*SRQ1*). In this dissertation, we theoretically distinguish among four fundamental *networking orientations*: "upward," "downward," "outward" (Moore, 1995; O'Toole, Meier, & Nicholson-Crotty, 2005) and "sideward." Networking upward captures managers' networking activities with political principals and superiors. For Dutch primary schools, the school board is the main "principal" to the school. Downward-oriented managerial networking (also referred to as team involvement in Chapter 5) refers to contact with subordinates. Networking outward refers to managers' interactions with various types of actors and organizations in the external environment, "such as suppliers, [external] stakeholders, alliance partners, regulatory agencies,

or political institutions" (Torenvlied et al., 2013, p. 252). Dutch primary school principals also need co-operation from peers, such as other school principals, the participatory council, and the parent committee, to properly implement their organizational and educational goals, strategies and programs (Torenvlied et al., 2013). Networking sideward refers to managers' networking activities with such co-producers. In each chapter, we use a cumulative scaling technique to determine whether the different managerial networking orientations can be identified (Torenvlied et al., 2013; Zhu et al., 2015).

Chapters 2 and 3 address the extent to which different dimensions of managerial networking—conceptualized as upward-, downward-, sideward- and outward-oriented managerial networking—moderate the effect of environmental challenges on public sector performance (*SRQ 2*). Specifically, in Chapter 2, we examine how the interactions between different managerial networking orientations and environmental shocks, which are conceptualized as changes in client populations, affect school performance. In Chapter 3, we study how different managerial networking orientations interact with burdensome external rules, regulations, and procedures that challenge the organization's functioning (Bozeman, 1993; 2000), that is, red tape.

The next step is to answer the question concerning the extent to which different dimensions of managerial networking moderate the effect of other management activities on public sector performance (*SRQ3*). In Chapter 4, we examine how the interactions between different networking orientations and performance management affect school performance. Performance management is a cyclical process during which managers measure and use performance information to set organizational goals and make managerial decisions to achieve those goals (Moynihan, 2008; Hvidman & Andersen, 2013; Nielsen, 2013).

Finally, in Chapter 5, we address our fourth secondary research question concerning whether the effects of different dimensions of managerial networking on public sector performance are mediated by intermediary variables that precede performance (*SRQ4*). We argue that downward-oriented managerial networking is an intermediary variable that mediates the effects of the other managerial networking orientations.

In the previous empirical chapters, we build upon the extensive public management literature. By studying the effects of changes in the client population, red tape, and performance management, we contribute to the broader public management literature, in addition to the literature on managerial networking.

6.1.4 Context and research design

The context of this study is Dutch primary education. Specifically, we study the management activities of Dutch primary school principals. Dutch school principals establish the school's educational curriculum; they coach teachers; develop plans for pedagogical quality, student care, and quality control; and monitor student performance. School principals also have

considerable administrative duties associated with the day-to-day management of the school. They are responsible for the planning of activities, the management of human resources, and the development and maintenance of buildings. School principals are also the main representatives of the school with external contacts and therefore maintain relationships with organizations and actors in the school's environment.

To test our hypotheses, we use data from a nation-wide survey of principals of Dutch primary schools that we conducted in 2010 (wave 1; used in Chapters 2, 3, and 5) and 2013 (wave 2; used in Chapter 4). We asked the school principals, among other topics, about their managerial activities. For example, we asked the school principals about their relations with different types of external organizations and actors, which enabled us to distinguish between the different managerial networking dimensions. The survey data used in the present study were enriched with data from the Dutch Inspectorate of Education and the Dienst Uitvoering Onderwijs (DUO, Education Executive Agency), which contained information about school performance—that is, schools' average student scores on standardized Cito tests—as well as a wide range of variables related to school and student characteristics.

In this concluding chapter, we first (in paragraph 6.2) summarize the results of the empirical chapters in this study. Subsequently, in paragraph 6.3, we discuss the general conclusions that may be drawn based on our findings. Finally, in paragraph 6.4, we discuss the limitations of this dissertation and formulate several suggestions for future research.

6.2 Summary of the findings and conclusions of each chapter

This dissertation is based on four empirical studies that are presented in Chapters 2 to 5. Figure 6.1 presents a summary of the results of the empirical chapters.

6.2.1 The multi-dimensional nature of managerial networking

Before we discuss the results of each empirical chapter, we first evaluate the results of our first secondary research question: to what extent can we distinguish multiple dimensions of managerial networking in the context of Dutch primary education (*SRQ1*)?

In Chapters 2, 3, and 5, we use data obtained from a survey of Dutch primary school principals in 2010 (wave 1). In these chapters, we theoretically distinguish between four fundamental networking orientations: "upward," "downward," "outward" (Moore, 1995; O'Toole et al., 2005), and "sideward." Networking upward is operationalized as the school principal's interaction frequency with the school board. Networking downward is measured as the school principal's interaction frequency with the staff in relation to several issues, such as personnel and employment policy, student results and performance monitoring, and scheduling and other practicalities. To measure networking outward, we use three networking outward scales: networking with local government actors, networking with

national government actors, and networking with interest groups in the labor domain. Finally, networking sideward is operationalized as the interaction frequency with three co-production actors: the parent committee, the participatory council, and principals that are part of the same board.

To test the internal consistency of the networking scales that are used to measure the different managerial networking orientations (except upward-oriented networking), we use Mokken scale analysis (MSA), which is a non-parametric variant of item-response theory (Mokken, 1971; also see Torenvlied et al., 2013; Zhu et al., 2015). All scales have a homogeneity *H* between 0.30 and 0.50, that is acceptable (Van Schuur, 2003). We also examined the correlations between the different networking scales to assess the external validity of the scales. The correlations are generally low, which shows that the networking scales indeed measure separate aspects of managers' networking behavior.[1] Hence, managerial networking is not a one-dimensional phenomenon, as is commonly operationalized in the vast majority of managerial networking studies.

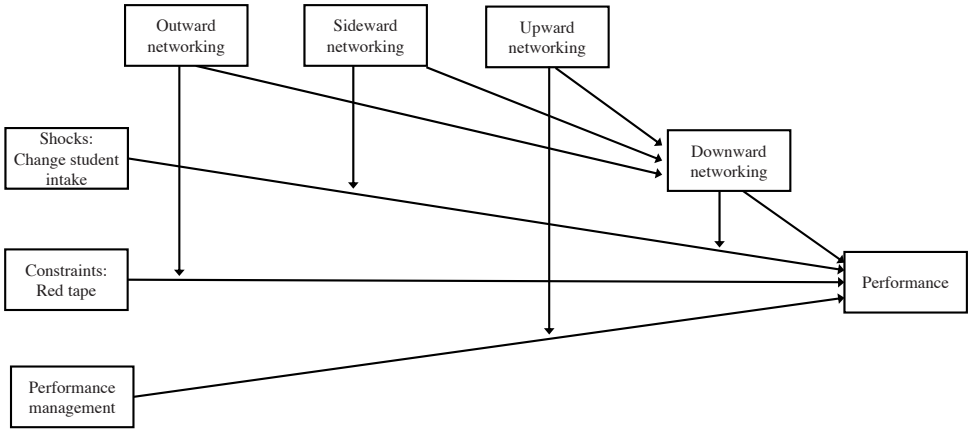

Figure 6.1 Summary of the results of the empirical chapters.

In Chapter 4, we use data obtained from a survey of Dutch primary school principals in 2013 (wave 2). The first wave of this survey asked school principals about forty-one different types of external organizations and actors. However, due to space restrictions, the length of the managerial networking scale in the 2013 survey was reduced to fifteen items. In wave 2, we did not ask the school principals about their interaction frequencies with co-production actors. As a result, we were not able to include the sideward managerial networking orientation. In addition, the survey did not include networking questions about interactions with interest

1 With one exception between interest group networking and national government networking ($\rho \approx 0.5$).

organizations in the labor relations domain. To measure networking outward, we instead included a youth care networking scale, which is formed by interactions with actors such as the school attendance officer and the municipal youth service. In line with the analyses in Chapters 2, 3, and 5, the networking scales satisfy the criterion of homogeneity, and the correlations between the scales are low.

6.2.2 Networking for environmental shocks (Chapter 2)

The first two empirical chapters of this dissertation study the moderating effect of managerial networking on the effects of environmental challenges on organizational performance (*SRQ2*).

In Chapter 2, we examine whether managerial networking moderates the effect of shocks in the school's task environment on school performance in terms of the schools' average student scores on a standardized test. Environmental shocks are conceptualized as the percentage change in the number of students from one year to the next.

The first hypothesis, which is based on both the organizational environment literature (Aldrich, 2008; Emery & Trist, 1965; Pfeffer & Salancik, 2003) and the public management and performance literature (O'Toole & Meier, 1999; 2011; Nicholson-Crotty & O'Toole, 2004; Boyne & Meier, 2009; Hicklin, O'Toole, Meier, & Robinson, 2009), predicts that the percentage change in the number of students negatively affects school performance. The second hypothesis, which is based on the public management literature that builds on the principal-agent problem (Meier, O'Toole, Boyne, & Walker, 2007; O'Toole et al., 2005; Bozeman, 1993), predicts that school principals' intensity of upward-oriented managerial networking reinforces the negative effect of the percentage change in the number of students on school performance. Based on the public management and performance literature (O'Toole & Meier, 1999; 2011; Meier, O'Toole, & Hicklin, 2010; Boyne & Meier, 2009), we further hypothesize that the intensity of downward-, sideward-, and outward-oriented managerial networking attenuates the negative effect of the percentage change in the number of students on school performance.

The results provide insights into *SRQ2* in two ways. First, we show that the percentage change in the number of students negatively affects organizational performance. This finding is consistent with previous studies of environmental shocks and organizational performance (for example, Boyne & Meier, 2009, Meier & O'Toole, 2009; Zinn, Mor, Feng, & Intrator, 2009; Andrews et al., 2013). Second, the results show that the negative effect of the percentage change in the number of students is attenuated by managerial networking (O'Toole & Meier, 1999; 2011; Meier, et al., 2010; Boyne & Meier, 2009). Specifically, we find that this negative effect is moderated exclusively by sideward networking with co-producers and downward-oriented managerial networking with subordinates. These findings indicate that networking sideward and downward benefit organizational performance in times of environmental turbulence by stabilizing the educational process.

These results suggest that O'Toole and Meier's (1999; 2011) expectation that environmental shocks are moderated primarily by more externally oriented managerial networking activities is too simple. Moore's (1995) directional management model provides a framework to specify which specific managerial networking activities are beneficial in dealing with environmental shocks—which is more informative than exclusively studying the moderating effects of public managers' overall networking activities.

6.2.3 Networking for environmental constraints (Chapter 3)

In Chapter 3, we attempt to answer *SRQ2* by studying the moderating effect of managerial networking on the effect of a less erratic dimension of environmental challenges that likewise challenges an organization's functioning, that is, environmental constraints. Whereas environmental shocks are irreversible and difficult to predict and plan for (Aldrich, 2008), environmental constraints are more predictable and are therefore manipulable and even potentially removable (Pfeffer & Salancik, 2003). Consequently, it is likely that the moderating effect of managerial networking works through specific mechanisms that differ from the mechanisms that underlie the management of environmental shocks.

In Chapter 3, we focus on constraints from the institutional, political, and legal environments of public organizations. We conceptualize these constraints in terms of public managers' perceived external red tape, that is, "impressions on the part of managers that formalization (in the form of burdensome rules and regulations) is detrimental to the organization" (Pandey & Kingsley, 2000, p. 782). Based on the red tape literature (Bozeman, 1993; 2000; Bozeman & Feeney, 2011; Gore, 1993; Kaufman, 1977), we hypothesize that external red tape negatively affects school performance. In addition, we predict that the negative effect of red tape is attenuated by upward-, downward-, sideward-, and outward-oriented managerial networking. These hypotheses are based on the red tape literature (Bozeman, 1993; 2000; Bozeman & Feeney, 2011), the public management and performance literature (O'Toole & Meier, 1999; 2011; Nicholson-Crotty & O'Toole, 2004; Boyne & Meier, 2009; Hicklin et al., 2009), and the organizational environments literature (Pfeffer & Salancik, 2003). Empirically, we distinguished between general external red tape and personnel red tape.

The results provide additional insights into *SRQ2*. First, we find that personnel red tape negatively affects organizational performance. The negative effect of personnel red tape on organizational performance replicates the results of previous studies by Pandey and Moynihan (2006), Pandey, Coursey, & Moynihan, (2007), and Brewer and Walker (2010) in a new context. Second, we find that the negative effect of personnel red tape on school performance is attenuated exclusively by outward-oriented managerial networking. Hence, our findings provide support for Bozeman's (1993; 2000) external control model (cf. Torenvlied & Akkerman, 2012; Walker & Brewer, 2009a). According to this model, contact between public

managers and rule-imposing organizations, such as national and local government agencies, is expected to attenuate red tape by reducing the likelihood of the misapplication and the miscommunication of rules and by increasing the sense of rule ownership (Bozeman, 1993; 2000). Hence, our results suggests that public managers can actively manipulate environmental constraints (Pfeffer & Salancik, 2003).

In contrast to our expectations, we find that general external red tape positively affects school performance. One explanation for this unexpected positive effect could lie in the negative connotation of the survey instrument. Feeney (2012, p. 428) notes that the survey instrument measuring external red tape triggers an "overall negative response" because the negative connotation substitutes "for all negative aspects of bureaucracy." Conceptually, however, red tape is defined as burdensome rules that are detrimental to the organization. Hence, we may have measured not general external red tape but the principal's overall sense of restrictions that are imposed on public organizations. If the majority of these restrictions serve as a protective shield rather than red tape, schools whose principals are more aware of these restrictions might perform better than schools whose principals are ignorant of these restrictions. Consequently, principals of well-performing primary schools could be more inclined to report higher levels of "red tape" (bureaucracy) than principals of low-performing schools.

6.2.4 Making performance management work (Chapter 4)

In Chapter 4, we address the third secondary research question and examine the extent to which the different dimensions of managerial networking moderate the effects of other management activities on public sector performance in Dutch primary education (*SRQ3*). Specifically, we study how managerial networking moderates the effect of performance management on performance. The public management literature often emphasizes the necessity—and benefits—of performance management (De Bruijn, 2007; Moynihan, 2008; Van Dooren & Van de Walle, 2008; Boyne, 2010). Performance management is a cyclical process during which managers measure and use performance information to set organizational goals and actively manage the organization to achieve those goals (Andersen, 2008; Moynihan, 2008).

Based on the performance management literature (Moynihan, 2008; Boyne, 2010; Hood, 2006; Heinrich, 2002; de Lancer Julnes, 2008; Den Hartog, Boselie, & Paauwe, 2004; Moynihan & Hawes, 2012; Van de Walle & Van Dooren, 2010), we first hypothesize that performance management positively affects organizational performance. Moreover, we expect that networking provides public organizations with superior information about macro- and organizational level goals, about how to use and interpret performance information, and about how to translate performance information into clear and feasible goals for subordinates. Therefore, we hypothesize that the positive effect of performance management on organizational performance is reinforced by networking outward, upward, and downward.

Performance management is operationalized as the use and the duration of use of several performance management tools (Hvidman & Andersen, 2013).

The results provide insights into the extent to which the different dimensions of managerial networking moderate the effect of other management activities on public sector performance in two ways (*SRQ3*). First, the results show that in contrast to our expectations, an increase in the use of performance management tools from one year to the next has a negative effect on school performance. We find that initially the use of performance indicators has a positive effect, but the effects turns negative when school principals increase the number of performance indicators. These results contribute to the performance management literature by refuting the commonly held assumption that New Public Management (NPM) programs, such as performance management programs, are successful in the public sector (Hood, 1991; Moynihan, 2008; Van Dooren & Van de Walle, 2008; Boyne, 2010). Instead, our results support an alternative approach that criticizes the use of performance information (De Bruijn, 2007; Bouckaert & Balk, 1991; Smith, 1995; Van Thiel & Leeuw, 2002). One possible explanation for these results could be the elusiveness of public policy objectives (Dahl & Lindblom, 1953; Downs, 1967; Rainey & Bozeman, 2000; Hvidman & Andersen, 2013; Chun & Rainey, 2005; 2006). Because public policies often have many goals, which are sometimes contradictory, performance indicators are usually contested measures; thus, their use thwarts the evaluation of performance information. Second, the data provide no evidence that managerial networking allows managers to further leverage the promises of performance management. Rather, we find that the negative effect of performance management on performance is stronger for school principals who interact frequently with members of their board. This result could be explained by the idea that contact with the school board signifies over-control. Over-controlling boards are likely to encourage school principals to use more and more performance information tools, which ultimately results in poor performance.

6.2.5 Transforming input into performance (Chapter 5)

Chapter 5 focuses on the extent to which the effect of the different dimensions of managerial networking on public sector performance in Dutch primary education is mediated by intermediary variables that precede performance (*SRQ4*).

The concept of managerial networking originates in the open system perspective (O'Toole & Meier, 2011). The core elements of organizations as open systems are input, throughput, and output (Katz & Kahn, 1978). According to this perspective, management facilitates the technical flows that transform resources and demands into output, which ultimately affects the organization's performance (Scott, 2003). For the external resources that are obtained through managerial networking to affect organizational performance, public managers must manage inside the organization.

In Chapter 5, we examine the mediating role of internal management on the relationship

between managerial networking and organizational performance. Internal management is conceptualized by downward-oriented networking and is also sometimes referred to as "team involvement" (O'Toole, Torenvlied, Akkerman, & Meier, 2014)—that is, public managers' regular involvement of and consultation with subordinates (O'Toole et al., 2005) regarding a broad range of organizational matters. Successful downward networking helps at the operational level to 'digest' the resources and information that managers obtain through more externally oriented networking activities, that is, outward, upward, and sideward managerial networking. The key assumption is that outward, upward, and sideward networking provide the organization with resources and information about constraints, which are necessary inputs for the internal production of products and services, while downward networking facilitates the transformation of resources into performance.

Based on both the open system literature (Scott, 2003; Katz & Kahn, 1978; Buckley, 1967) and the public management literature (Simon, 1997; O'Toole & Meier, 1999; 2011; Favero, Meier, & O'Toole, 2014), we propose that outward-, upward-, and sideward-oriented managerial networking positively affect school performance through increased downward-oriented managerial networking.

The results provide insights into *SRQ4*. Consistent with our expectations, we find that the effects of outward networking (specifically national government networking), upward networking (contact with the school board), and co-production networking (networking with co-producers) on school performance are mediated by downward-oriented networking. Our findings indicate that in order for externally obtained resources affect the organization's performance, public managers must (re)allocate and disseminate those resources within their organizations to optimize organizational processes (Scott, 2003). Specifically, our findings suggest that team involvement facilitates the 'digestive' capabilities of subordinates (Favero et al., 2014; Kadushin, 1992). Hence, the present study is a first step toward a comprehensive understanding of the indirect effect of managerial networking on organizational performance.

6.3 Discussion and suggestions for future research

This section reflects on the general conclusions that can be drawn regarding our main research question: under what conditions do specific managerial networking dimensions affect public sector performance in Dutch primary education? We also formulate suggestions for future research.

6.3.1 The multi-dimensional nature of managerial networking

First, *managerial networking is not a one-dimensional phenomenon*—as is commonly assumed in the literature on managerial networking—but has several meaningful dimensions, which are each related to a specific type of support. We distinguished among managing upward toward

political principals, downward in the direction of subordinates and outward toward external actors and organizations (Moore, 1995; O'Toole et al., 2005). We added a fourth orientation: managing sideward in the direction of peers who are involved in the co-production of public services. Moreover, we divided outward-oriented networking into three sub-dimensions: national government networking that aims to obtain political support, local government networking that aims to obtain bureaucratic support, and interest group networking that aims to obtain interest representation. These dimensions and sub-dimensions were based on theoretical expectations about scale composition (Moore, 1995; O'Toole et al., 2005; Torenvlied et al., 2013) and were analyzed with a cumulative scaling technique to test for internal consistency (Torenvlied et al., 2013; Zhu et al., 2014).

Our results show that the different orientations of managerial networking have distinct moderating effects on school performance. Networking with co-producers (upward networking) and networking with subordinates (downward networking) moderate the negative effect of the percentage change in the number of students on organizational performance (Chapter 2). These findings suggest that interacting with co-producers and subordinates helps to stabilize the organization in the face of unpredictable environmental shocks. Networking with national and local government organizations and with interest groups (outward networking) moderates the negative effect of external red tape (Chapter 3), which suggests that outward-oriented managerial networking enables public managers to manipulate and reduce restrictions on the proper functioning of the organization. In contrast, networking with the school board (upward networking) attenuates the negative effect of performance management on organizational performance (Chapter 4). Hence, our study indicates that the different managerial networking orientations bring specific benefits to the organization. However, the present study also demonstrates that there are limits to effective networking.

In addition, we show that—ceteris paribus—the effects of upward, sideward, and outward networking are mediated by downward-oriented networking (Chapter 5). Resources—such as people, money, information, services, and technology—that are obtained through interactions with political principals, co-producers, and more external actors and organizations, such as national government agencies, are transformed into products and services through team involvement.

Our findings provide support for our approach, which treats managerial networking as a multi-dimensional concept. Such a model provides a stronger theoretical underpinning for our understanding of the relation between managerial networking and organizational performance (Torenvlied et al., 2013; O'Toole, 2015). Hence, future studies of managerial networking should incorporate the multi-dimensional model of managerial networking. A next step is to identify different types of public managers based on their levels of activity in the different networking dimensions (Torenvlied et al., 2013). For example, some managers

may be very active in networking outward with national and local government agencies, while others may invest more time and energy in networking sideward towards peers and co-producers. Insights into the determinants of managers' decisions about how much effort to put into the different networking dimensions will help us to link agency goals to networking activity (Torenvlied et al., 2013).

6.3.2 Environmental challenges and performance

Second, *environmental challenges negatively affect school performance*. This conclusion is based on Chapters 2 and 3. In Chapter 2, we show that shocks in the schools' task environment, which are measured as changes in the number of students from one school year to the next, negatively affect school performance. In Chapter 3, we show that constraints on the proper functioning of the organization—conceptualized as perceived personnel red tape—also negatively affect school performance. This dissertation demonstrates that the interdependent environment of a public organization has the potential to negatively affect organizational performance in terms of its effect on the resources sought by organizations (Aldrich, 2008; O'Toole & Meier, 1999; 2011), as well as constraints that restrict organizational behavior (Pfeffer & Salancik, 2003).

This study proves the relevance of understanding the organizational environment. Unfortunately, "the management field provides no exact science for analyzing them, in part because the concept is complex and difficult in various ways" (Rainey, 2009, p. 89). Most importantly, the environment consists of numerous elements that have the potential to affect the organization. To provide deeper and more nuanced explanations for how different environmental challenges affect the performance of organizations, at least two steps must be taken. The first step is to map the different environmental dimensions in which public organizations encounter these challenges. The next step is to develop theoretical insights into how these different dimensions affect the performance of public organizations.

6.3.3 The moderating effect of managerial networking on environmental challenges

Third, *managerial networking attenuates the negative effects of environmental challenges*. Chapters 2 and 3 demonstrated that distinct orientations of managerial networking moderate the negative effect of environmental challenges. In Chapter 2, we showed that school principals' networking activities with subordinates (downward networking) and with co-producers (sideward networking) attenuate the negative effect of the percentage change in the number of students. In Chapter 3, we demonstrated that the negative effect of personnel red tape was attenuated by principals' networking activities with national and local government agencies and interest groups (outward networking).

Interestingly, the negative effect of the percentage change in the number of students is moderated by networking with actors who are part of or in close proximity to the school

principal's organization, while personnel red tape is moderated exclusively by networking with more external actors. This finding suggests that environmental shocks are best managed by networking sideward and downward and environmental constraints are best managed by networking outward.

Our explanation for this difference between changes in the number of students and red tape is that shocks and constraints require specific managerial strategies. Conceptually, constraints are by definition "not predestined and irreversible" and are therefore potentially removable (Pfeffer & Salancik, 2003, p. 18). Environmental constraints contrast with environmental shocks, which are "produced by forces that are obscure to administrators and therefore difficult to predict or plan for" (Aldrich, 2008, p. 69). Pfeffer and Salancik (2003) distinguish between two roles that managers assume when responding to the environment. Managers can be (a) advocators and (b) processors. It is easier for managers to actively manipulate constraints and create an external environment that is more favorable to the organization; in the case of external red tape, this goal can be accomplished by networking with government organizations and interest groups. In contrast, environmental shocks are by definition less predictable and are therefore difficult to influence. Rather than taking on the role of advocator, managers should process the demands that are inflicted on the organizations by environmental shocks. To successfully process shocks, managers need support from and must coordinate with actors who are part of (or in close proximity to) the organization, such as subordinates, the board, and co-producers. Hence, in highly turbulent times, more internally oriented networking activities are preferred over outward-oriented managerial networking.

Our results suggest that the precise mechanisms that underlie the moderating function of managerial networking on the negative effects of environmental challenges may be conditional on the predictability of environmental challenges. Thus, we should expand the existing models of public management and performance in different environmental contexts—providing multiple conceptualizations of environmental shocks and environmental constraints.

6.3.4 The interaction between managerial networking and other management activities

Fourth, *managerial networking reinforces the negative effect of performance management*. In Chapter 5, we examine the extent to which outward-, upward-, and downward-oriented managerial networking reinforce the effect of performance management on public sector performance. First, we found that an increase in the use of performance management tools from one year to the next has a negative effect on school performance. In addition, the results show that the negative effect of performance management on school performance is stronger for school principals who invest more time and energy in networking with the school board (upward networking). This result suggests that strong 'principal-agent' relationships indicate a form of over-control that promotes the use of burdensome performance management tools,

which ultimately inhibits effective public management. Another explanation could be that—similar to research on the non-linear effects of managerial networking (Hicklin, O'Toole, & Meier, 2008; Schalk, 2015; Torenvlied & Akkerman, n.d.)—there is a saturation point for the benefits of management. In other words, too much managerial activity is bad for performance.

A small but significant branch of public management research studies how certain managerial variables are linked to other variables (McGuire, 2003; O'Toole & Meier, 2003; Meier & O'Toole, 2010). Future research on the conditional effects of managerial networking should also link managerial networking to other management variables, such as performance management, financial management, and HRM.

6.3.5 The indirect effect of managerial networking

Fifth, in addition to a moderating effect, *managerial networking has an indirect effect on school performance*. In Chapter 4, we show that downward-oriented networking mediates the relations between outward-, upward-, and sideward-oriented managerial networking and organizational performance. This study has provided us with a better (stepwise) understanding of the mechanisms that underlie the effect of managerial networking (and performance management) on performance than can be provided by more traditional direct effect models (Walker & Andrews, 2015). The more resources managers tap from the external environment, the more internal management activities they must employ to facilitate the technical flows that transform resources and demands into performance. To our knowledge, the mediating effect of internal management has not been tested empirically in previous studies or has not been given attention in the contemporary literature on public sector performance. Future research should further tease out the throughput function of other expressions of internal management.

6.3.6 Generalizability of findings

In this dissertation, we set out to answer the overall question concerning the conditions under which specific managerial networking dimensions affect the performance of Dutch primary schools. Our results suggest that—in this specific context—the separate networking dimensions each affect organizational performance under specific conditions. School principals' sideward- and downward-oriented networking activities attenuate the negative effect of environmental shocks, which are conceptualized as the change in the number of students. In turn, outward-oriented networking attenuates the negative effect of environmental constraints in the form of red tape. In addition, we find that school principals' level of upward networking aggravates the negative effect of performance management on performance. Finally, outward-, upward- and sideward-oriented networking affect school performance through school principals' downward-oriented managerial networking. An important question concerns whether our conclusions can be generalized to other public organizations.

We conclude that we can generalize the results of our study to other organizations that are similar to the primary schools included in this study. Dutch primary schools are relatively small public service organizations whose (high-ranking) public managers have high levels of autonomy and discretion and whose primary beneficiaries are their clients rather than the public at large. Examples of comparable social service organizations are home-care agencies, day-care centers, nursing homes, and child welfare organizations. These organizations must sometimes cope with drastic changes in client intake, and their environments inevitably incorporate political and legal constraints that guard their clients' interests. Moreover, these types of organizations must all deal with performance-driven public sector reforms.

6.3.7 Practical implications

The findings of our study have some important practical implications for school principals as well as school boards. First, the results point to the importance of monitoring the external environment of the school. The results of this dissertation show that environmental challenges can negatively affect the performance of schools. However, the results also show that school principals are able to attenuate these negative effects by maintaining relations with specific actors and organizations that provide resources to deal with specific challenges. By monitoring the external environment, school principals are able to early identify (future) changes in environmental factors, such as political, economic, social, technological, ecological, and legal factors. Subsequently, based on this information school principals should take appropriate action. For external management, this would require school principals to anticipate environmental change and proactively maintain relations with external actors and organizations that help school principals to deal with specific environmental changes by providing knowledge, information, and/or financial resources. However, in order to optimally manage environmental change, school principals need to know where to look. The results of this study should urge school boards to invest in educating their school principals on how to efficiently and effectively monitor the environment, and take appropriate action based on environmental challenges.

The second practical implication of this dissertation relates to another monitoring activity, namely monitoring the performance of schools. The core assumption of performance management is that the use of performance information enables public managers to make better-informed decisions on how to manage the organization and optimize performance. According to the performance management literature, effective performance management starts with the selection of appropriate performance-indicators to measure performance. After collecting performance information, managers must make the information meaningful and take appropriate action to improve performance. The results of this dissertation, however, suggest that there are limits to effective performance management—they even suggest that performance management has perverse effects. We find that initially the use of performance

indicators has a positive effect, but the effects turns negative when school principals increase the number of performance indicators. Our results suggest that school principals should use a select number of performance indicators that measure the same (or a comparable) performance goal instead of multiple performance indicators that measure contradictory performance goals. These results, too, should urge school boards to invest in educating their school principals. School principals need to be trained in which performance-indicators to measure and how to use performance information instead of being encouraged to measure every aspect of school performance.

6.4 Limitations and additional suggestions for future research

Finally, this dissertation has a number of limitations that point toward promising directions for future research. Below, we discuss these limitations and the associated paths for future research in public management.

6.4.1 Studying the concept of managerial networking

As discussed earlier, we followed O'Toole and Meier's (O'Toole & Meier, 2011; Meier & O'Toole, 2001; 2003) measurement of managerial networking, as captured by the frequency of relations with several types of external actors and organizations. The frequency of interaction is a necessary precondition for meaningful interactions, and Meier and O'Toole (2005) have proven that the managerial networking measure is a reliable measure that has substantial empirical support. However, over the past decade, scholars have pointed out some important limitations of this measure (Meier & O'Toole, 2005; McGuire, 2002; Goerdel, 2006; Torenvlied & Akkerman, 2012). Overall, when studying the effects of managerial networking using large-*n* designs, there is a tradeoff between intensive knowledge of the depth and meaning of those interactions and extensive testing for causal patterns across cases (Meier & O'Toole, 2005). More precisely, McGuire (2002) raises the concern that although the frequency and regularity of networking are accounted for, the multiple operational types of actions undertaken by the manager (for example, activating, framing, mobilizing, and synthesizing) are not. In addition, McGuire also criticizes the measure for not incorporating a sense of timing (that is, linking managerial action to specific (unforeseen) events) (Meier & O'Toole, 2005). Torenvlied and Akkerman (2012) argue that this measure of managerial networking "disregards the substantive content of relations (for example, information, trust, referral, advice, or other types of relations)" (p. 455). Moreover, interaction frequency does not provide information about who initiated the contact (Goerdel, 2006). Finally, the measure does not distinguish between buffering the system to minimize the impact of environmental challenges (M3 in the O'Toole and Meier model) and exploiting the environment for critical resources (M4 in the O'Toole and Meier model).

Our research design did not account for these shortcomings for two reasons. First, the managerial networking measure allows for large-*n* investigations of public managers' dyadic relations with various actors (Meier & O'Toole, 2005). Provided that large-*n* and dyadic relation-based studies are carefully designed and "focus on theory with clear concepts and precise measurement," they strengthen the internal validity of inferences regarding networking-performance relationships (Meier & O'Toole 2005, p. 525). Hence, we chose generalizability in service of theory development over intensive knowledge of the depth and meaning of the interactions. Second, we decided not to include questions about the content of the interactions given the size of the questionnaire.

In line with the majority of managerial networking studies, we could not assess school principals' motives for interacting with different types of external organizations, such as networking for information, trust, referral, or advice. An important avenue for future research is therefore to examine these motives for managerial networking.

6.4.2 Studying the causality between managerial networking and performance

An important problem of public management research is potential reversed causality (Meier, Polinard, & Wrinkle, 2000; Van de Walle & Bouckaert, 2003). Compelling arguments can be made for a reversed link between managerial networking and public service performance. In a recent theoretical paper, Favero, Meier, and Zhu (2015) generated a theoretical model to describe how performance gaps affect a variety of managerial decisions—including managerial networking. Those authors argue that if an organization fails to meet performance expectations, managers are inclined to determine the cause of the performance gap and/or identify the possible solutions for filling the performance gap. Managerial networking is an obvious activity for gathering such information from external organizations, such as government and other monitoring agencies. Hence, performance gaps would increase managerial networking activities.

In Chapter 3 and 5, we attempted to deal with the issue of reversed causality by including a (lagged) performance variable for performance in the previous year to test an "autoregressive model". In Chapter 4, we tested whether school performance during a certain period has a significant effect on performance management during the subsequent period. Future research should account for the reversed causality—or feedback effects—between networking and performance by making use of panel data and/or (field) experiments.

6.4.3 Studying multiple dimensions of organizational performance

Public service performance is considered to have multiple dimensions, such as efficiency, effectiveness, equity, and consumer satisfaction (Boyne, 2002; 2003; O'Toole & Meier, 2011), and these dimensions can be measured in numerous ways. Although public organizations typically have more than one performance dimension (Hvidman & Anderson, 2013), we

measured organizational performance using a single indicator of effectiveness, that is, average Cito test scores. Although the Cito test score is considered to be authoritative by the Dutch Inspectorate of Education, as well as by most principals, teachers and parents, standardized tests do not measure all relevant aspects of the performance of an educational system. For example, effectiveness could also be measured based on the educational hours per student or based on student performance during the first year of secondary education. Moreover, efficiency could be conceptualized as the education costs per student. Client satisfaction could be measured by surveying students' parents.

It was beyond the scope of this study to include other dimensions of performance besides effectiveness. Therefore, we were not able to provide information about how managerial networking affects these other dimensions of performance, nor did we examine whether an improvement in one performance dimension is obtained at the cost of other dimensions (Hvidman & Andersen, 2013). For example, some managers may prioritize efficiency before quality. This topic is also an interesting avenue for future research.

6.4.4 Studying several environmental challenges simultaneously

Finally, we conclude with an additional suggestion for the study of the organizational environment. Because public organizations by nature depend on various external resources for the production of public goods and services, organizations are inevitably faced with several environmental challenges at the same time—ranging from relatively predictable constraints to erratic shocks. The scope of this dissertation did not include the study of several environmental challenges simultaneously.

Managers might simply deal with multiple environmental challenges the same way they deal with multiple goals (Cyert & March, 1963)—by treating them as independent phenomena and dealing with each challenge in sequence. A more realistic view of the environment would be that "environments are being disturbed by increasing environmental interconnection, and an increasing rate of interconnection" (Aldrich, 2008, p. 69). Hence, managers must deal with several (interconnected) environmental challenges at the same time. However, in agreement with Pfeffer and Salancik (1978; 2003), March (1994) argues that managers cannot attend all environmental challenges because "time and capabilities for attention are limited" (p. 10). Thus, managers must 'choose their battles wisely.' An important question then becomes how managers actually deal with the interconnectedness in the environments of their organizations.

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Appendix

Table A1 School background characteristics and school performance for the schools in the analysis and for schools not in the analysis—Chapter 2 (wave 1)

	Schools in analysis (n ≈ 546)		Schools not in analysis (n ≈ 6287)		
	Mean	**S.d.**	**Mean**	**S.d.**	**t-value[a]**
Background characteristics					
Number of students	235.18	137.26	223.61	138.32	1.88+
% Disadvantaged students	29.18	34.40	28.70	38.34	.28
Staff in fte	16.23	8.92	15.84	9.42	.90
	%		%		Cramer's V
Outcomes assessment[b]					
Sufficient	72.0		71.5		.003
Insufficient	28.0		28.5		
Denomination					
Non-denominational	28.4		33.2		.050***
Roman Catholic	37.2		29.4		
Protestant	26.0		26.2		
Other denomination	8.4		11.2		
Vision					
Dalton	2.7		2.2		.023
Jenaplan	1.6		2.1		
Montessori	1.1		1.7		
Regular	93.4		92.3		
Other	1.1		1.7		

Note. Data provided by the Central Finance Agency (DUO) and the Dutch Inspectorate of Education.
[a] Results of parametric two-sample t-tests on difference between mean values of school background characteristics;
[b] Assessment of outcomes for 2008 by the Dutch Inspectorate of Education.
+ < .10; * < .05; ** p < .01

Table A2 School background characteristics and school performance for the schools in the analysis and for schools not in the analysis—Chapter 3 (wave 1)

	Schools in analysis (n ≈ 523)		Schools not in analysis (n ≈ 6318)		
	Mean	**S.d.**	**Mean**	**S.d.**	**t-value**[a]
Background characteristics					
Number of students	233.97	136.30	223.77	138.40	1.61
% Disadvantaged students	29.57	34.81	28.67	38.32	.52
Staff in fte	16.19	8.88	15.85	9.42	.78
	%		%		Cramer's V
Outcomes assessment[b]					
Sufficient	72.0		71.5		.003
Insufficient	28.0		28.5		
Denomination					
Non-denominational	28.0		33.2		.053***
Roman Catholic	37.7		29.4		
Protestant	26.2		26.2		
Other denomination	8.2		11.2		
Vision					
Dalton	2.9		2.2		.021
Jenaplan	1.7		2.1		
Montessori	1.2		1.7		
Regular	93.0		92.4		
Other	1.2		1.7		

Note. Data provided by the Central Finance Agency (DUO) and the Dutch Inspectorate of Education.
[a] Results of parametric two-sample t-tests on difference between mean values of school background characteristics;
[b] Assessment of outcomes for 2008 by the Dutch Inspectorate of Education.
+ < .10; * < .05; ** p < .01

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Table A3 School background characteristics and school performance for the schools in the analysis and for schools not in the analysis—Chapter 4 (wave 2).

	Schools in analysis (n ≈ 481)		Schools not in analysis (n ≈ 6168)		
	Mean	**S.d.**	**Mean**	**S.d.**	**t-value[a]**
Background characteristics					
Number of students	235.05	139.79	221.06	139.23	2.12*
% Disadvantaged students	25.65	31.19	23.94	32.78	1.10
Staff in fte	14.81	9.75	13.76	9.05	2.43*
Cito test scores 2014 (*n* = 5135)	534.52	4.23	534.50	4.18	.08
	%		%		Cramer's V
Denomination					
Non-denominational	28.9		32.7		.046**
Roman Catholic	37.6		29.6		
Protestant	22.2		25.8		
Other denomination	11.2		11.9		
Vision					
Dalton	1.9		2.1		.019
Jenaplan	1.5		1.7		
Montessori	1.2		2.2		
Regular	92.7		91.5		
Other	2.7		2.5		

Note. Data provided by the Central Finance Agency (DUO) and the Dutch Inspectorate of Education.
[a] Results of parametric two-sample t-tests on difference between mean values of school background characteristics;
[b] Assessment of outcomes for 2008 by the Dutch Inspectorate of Education.
+ < .10; * < .05; ** p < .01

Table A4 School background characteristics and school performance for the schools in the analysis and for schools not in the analysis—Chapter 5 (wave 1).

	Schools in analysis (n ≈ 547)		Schools not in analysis (n ≈ 6286)		
	Mean	**S.d.**	**Mean**	**S.d.**	**t-value[a]**
Background characteristics					
Number of students	235.43	137.26	223.59	138.32	1.92+
% Disadvantaged students	29.26	34.41	28.69	38.37	.34
Staff in fte	16.25	8.92	15.84	9.42	.96
	%		%		Cramer's V
Outcomes assessment[b]					
Sufficient	72.0		71.5		.004
Insufficient	28.0		28.5		
Denomination					
Non-denominational	28.5		33.2		.049***
Roman Catholic	37.1		29.4		
Protestant	26.0		26.2		
Other denomination	8.4		11.2		
Vision					
Dalton	2.7		2.2		.023
Jenaplan	1.6		2.1		
Montessori	1.1		1.7		
Regular	93.4		92.3		
Other	1.1		1.7		

Note. Data provided by the Central Finance Agency (DUO) and the Dutch Inspectorate of Education.
[a] Results of parametric two-sample t-tests on difference between mean values of school background characteristics; [b] Assessment of outcomes for 2008 by the Dutch Inspectorate of Education.
+ < .10; * < .05; ** p < .01

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Nederlandse samenvatting (summary in Dutch)

Netwerkgedrag van managers en prestaties van publieke organisaties: Een onderzoek onder scholen in het Nederlandse primair onderwijs.

INLEIDING

Dit proefschrift bestudeert de samenhang tussen de relaties die managers van organisaties in de publieke sector onderhouden en de kwaliteit van de publieke dienstverlening door deze organisaties. Publieke organisaties zijn verantwoordelijk voor het produceren en leveren van publieke goederen en diensten voor burgers en maken daarvoor gebruik van algemene middelen. Voorbeelden van publieke goederen en diensten zijn onderwijs, afvalbeheer, watervoorziening, rechtshandhaving en sociale diensten. Doelen van publieke organisaties worden meestal vastgesteld door politieke besluitvormers. Zo moeten, bijvoorbeeld, basisscholen voldoen aan landelijke standaarden voor de kwaliteit van onderwijs. De mate waarin publieke organisaties deze doelen verwezenlijken vertelt ons hoe goed deze organisaties 'presteren'.

Om goed te kunnen presteren dienen publieke organisaties te beschikken over een efficiënte en effectieve interne organisatie, zoals een goed functionerend technisch systeem, bekwaam personeel, en passende formele en informele organisatiestructuren. Echter, geen enkele publieke organisatie is zelfvoorzienend. Om te overleven en publieke doelen te bereiken, hebben publieke organisaties ook hulpbronnen nodig vanuit de externe omgeving van de organisatie, zoals geld, informatie, kennis, en macht. Publieke organisaties zijn daarvoor afhankelijk van actoren en organisaties die, vanuit de externe omgeving van de eigen organisatie, deze hulpbronnen faciliteren. In verband met hun publiek eigenaarschap en de publieke bekostiging / financiering zijn publieke organisaties in grotere mate afhankelijk van deze externe omgeving dan private organisaties.

Naast faciliteren, door toelevering van hulpbronnen, leggen externe actoren en organisaties uit de omgeving de eigen organisaties ook restricties op. Voorbeelden van dergelijke restricties zijn wettelijke vereisten, prestatienormen, sociale eisen en verwachtingen, en technologische ontwikkelingen. Deze restricties scheppen vaak de voorwaarden voor het goed functioneren van publieke organisaties. Te denken valt aan regels met betrekking tot de veiligheid van werknemers of het voorkomen van nepotisme en corruptie. Restricties kunnen daarentegen ook belastend zijn voor de prestaties van organisaties doordat de naleving van dergelijke regels een beroep doet op de middelen die in eerste instantie nodig zijn voor het primaire productieproces van de organisatie.

In algemene zin kan de externe omgeving van een publieke organisatie het functioneren van de organisatie op twee manieren beïnvloeden: (a) door het verstrekken van hulpmiddelen en (b) door het opleggen van restricties. Het managen van de externe omgeving is een uiterst

belangrijke taak voor publieke managers, omdat elementen van de externe omgeving op onvoorspelbare manieren kunnen veranderen. Voorbeelden van dergelijke veranderingen zijn plotselinge bezuinigingen, abrupte veranderingen van het cliëntenbestand, om drastische veranderingen in de bestaande wet- en regelgeving. In bestuurskundig onderzoek op het gebied van publiek management worden dergelijke plotselinge veranderingen ook wel "turbulentie" of "schok" in de omgeving genoemd. Een belangrijkste assumptie in dit proefschrift is dat turbulentie en schokken in de omgeving de prestaties van een publieke organisatie negatief beïnvloeden.

Door relaties aan te knopen met actoren en organisaties in de omgeving van de organisatie, kunnen publieke managers invloed uit oefenen op die omgeving om een voorspelbare en controleerbare stroom van hulpmiddelen en restricties te waarborgen. De relaties die publieke managers onderhouden met verschillende organisaties en actoren in de omgeving van hun organisaties, zoals leveranciers, stakeholders, coproducenten, politieke instellingen, en klanten, wordt vaak aangeduid met de Engelse term "managerial networking". Managerial networking wordt gedefinieerd als de netwerkactiviteit van managers en combineert de omvang van het netwerk en de intensiteit van het netwerkgedrag. De centrale gedachte van dit proefschrift is dat de netwerkactiviteiten van publieke managers de prestaties van publieke organisaties positief beïnvloeden via twee mechanismen: (1) het verzamelen van hulpbronnen, en (2) het beschermen tegen onverwachte veranderingen in de omgeving.

Management van de externe omgeving kan pas dan een positief effect hebben op de prestaties van een organisatie wanneer publieke managers ook de interne omgeving van hun organisatie beheren. Een goed functionerend technisch systeem, bekwaam personeel, en passende formele en informele organisatiestructuren zijn noodzakelijk voor de transformatie van hulpbronnen en restricties tot goederen en diensten die publieke waarde toevoegen. In dit proefschrift kijken we naast de netwerkactiviteit van publieke managers met actoren en organisaties in de externe omgeving ook naar de interactie tussen publieke managers en actoren binnen, of in de nabijheid van, de organisatie (zoals bestuur en werknemers).

Het belangrijkste doel van dit proefschrift is om inzicht te krijgen in *hoe* de netwerkactiviteiten die publieke managers onderhouden met actoren in de interne en externe omgeving van hun organisatie van invloed zijn op de prestaties van de organisatie. Dit doel valt uiteen in een viertal subdoelen.

Het eerste subdoel is om meer inzicht te krijgen in de effecten van verschillende *dimensies* van netwerkactiviteit. Eerdere studies naar de netwerkactiviteit van publieke managers beschrijven de netwerkactiviteiten van managers aan de hand van één activiteitenmaat. Veel van deze studies vonden dat de meest actieve managers ook de meest succesvolle managers zijn. Deze resultaten impliceren dat managers met een impulsieve en overactieve netwerkstijl de beste zijn. Theoretisch kunnen we echter verwachten dat managers relaties onderhouden met externe actoren en organisaties die helpen bij het behalen van specifieke prestaties

in specifieke situaties. Bijvoorbeeld, succesvolle managers van publieke organisaties in achterstandswijken onderhouden waarschijnlijk relaties met allerlei hulpverleningsinstanties. Hieruit kunnen we afleiden dat er verschillende typen van externe actoren en organisaties zijn die verschillende dimensies van netwerkactiviteit reflecteren. Er is echter in het huidige bestuurskundig onderzoek nog niet veel bekend over hoe verschillende dimensies van netwerkactiviteit van invloed zijn op de prestaties van publieke organisaties.

Ten tweede willen we meer licht werpen op de vraag in welke situaties en onder welke *condities* netwerkactiviteiten van invloed zijn op de prestaties van organisaties. Theoretisch kunnen we verwachten dat netwerkactiviteiten de negatieve effecten van turbulentie in de externe omgeving op prestaties kunnen verzwakken. Daarnaast kunnen er theoretische argumenten worden aangevoerd die betrekking hebben op de versterkende effecten van netwerkactiviteiten op de effecten van andere management activiteiten. Opvallend genoeg is er weinig systematisch onderzoek naar de condities, de omstandigheden, waaronder netwerkactiviteiten van invloed zijn op de prestaties van publieke organisaties.

Ten derde willen we meer inzicht krijgen in het *indirecte* effect van netwerkactiviteiten op prestaties. Zoals eerder besproken, kunnen externe netwerkactiviteiten pas een positief effect hebben op de prestaties van een organisatie wanneer publieke managers ook de interne omgeving van hun organisatie beheren. Tot op heden is er nog geen empirisch onderzoek gedaan naar de vraag of interne management activiteiten de transformatie van hulpbronnen in goederen en diensten inderdaad faciliteren.

Tot slot willen we de relatie tussen netwerkactiviteiten en de prestaties van publieke organisaties testen in een *nieuwe context*. De meerderheid van de studies naar de effecten van netwerkactiviteiten op prestaties is uitgevoerd in de Verenigde Staten, met name onder de managers van Texaanse schooldistricten. Deze studies vinden inderdaad dat de netwerkactiviteiten van publieke managers een positief effect hebben op de prestaties van Amerikaanse publieke organisaties. Om de generaliseerbaarheid van de netwerk-prestatie theorie te beoordelen, dient de theorie echter getest te worden in een andere context. De context waarin het huidige onderzoek plaatsvindt is het Nederlandse primair onderwijs. Specifiek zijn we geïnteresseerd in de effecten van de netwerkactiviteiten van schoolleiders op de school prestaties van basisscholen.

Op basis van deze doelstellingen, tracht dit proefschrift de volgende algemene onderzoeksvraag te beantwoorden:

- *Onderzoeksvraag*: Onder welke condities hebben verschillende dimensies van netwerkactiviteit invloed op de prestaties van scholen in het Nederlandse primair onderwijs?

Om deze algemene onderzoeksvraag te beantwoorden, zijn er vier deelvragen opgesteld:

- *Deelvraag 1*: In hoeverre kunnen we verschillende dimensies van netwerkactiviteit onderscheiden in de context van het Nederlandse primair onderwijs?
- *Deelvraag 2*: In hoeverre modereren verschillende dimensies van netwerkactiviteit de effecten van bedreigingen in de omgeving op de prestaties van scholen in het Nederlandse primair onderwijs?
- *Deelvraag 3*: In hoeverre modereren verschillende dimensies van netwerkactiviteit de effecten van andere management activiteiten op de prestaties van scholen in het Nederlandse primair onderwijs?
- *Deelvraag 4*: In hoeverre worden de effecten van verschillende dimensies van netwerkactiviteit op de prestaties van scholen in het Nederlandse primair onderwijs gemedieerd door intermediaire variabelen?

Om te onderzoeken in hoeverre we verschillende dimensies van netwerkactiviteit kunnen onderscheiden (*Deelvraag 1*), maken we in elk empirisch hoofdstuk van dit proefschrift theoretisch onderscheid tussen vier fundamentele netwerkoriëntaties: "opwaarts" (in het Engels: "upward"), "neerwaarts" (in het Engels "downward"), "zijwaarts" (in het Engels "sideward") en "naar buiten" (in het Engels "outward"). Opwaarts netwerken verwijst naar de netwerkcontacten die schoolleiders onderhouden met het schoolbestuur. Neerwaarts netwerken verwijst naar de netwerkcontacten tussen schoolleiders enerzijds en leraren en ondersteunende staf anderzijds. Zijwaarts netwerken verwijst naar de netwerkactiviteiten met coproducenten, zoals andere schoolleiders, de medezeggenschapsraad en de ouderraad. Naar buiten netwerken, tot slot, verwijst naar de relaties die schoolleiders onderhouden met externe actoren, zoals de gemeentelijke dienst onderwijs, de onderwijsinspectie, het DUO, en werknemers- en werkgevers organisaties. Opwaarts, neerwaarts en zijwaarts netwerken worden beschouwd als uitingen van intern management, terwijl naar buiten netwerken wordt gezien als een uiting van extern management.

In Hoofdstuk 2 en 3 van dit proefschrift onderzoeken we in hoeverre opwaarts, neerwaarts, zijwaarts, en naar buiten netwerken de effecten van bedreigingen in de omgeving op de prestaties modereren (*Deelvraag 2*). Daarbij maken we onderscheid tussen veranderingen in

de omgeving (Hoofdstuk 2) en restricties uit de omgeving (Hoofdstuk 3). In Hoofdstuk 2 zijn dat veranderingen in het aantal leerlingen, en in Hoofdstuk 3 zijn dat bezwarende externe regels, voorschriften en procedures.

In Hoofdstuk 4 van dit proefschrift onderzoeken we in hoeverre opwaarts, neerwaarts, zijwaarts, en naar buiten netwerken de effecten van andere management activiteiten op de prestaties van scholen modereren (*Deelvraag 3*). We richten ons daarbij specifiek op de effecten van prestatiemanagement. Prestatiemanagement is een cyclisch proces waarin managers doelen (bij)stellen op basis van meetbare prestatie-indicatoren.

In Hoofdstuk 5 van dit proefschrift richten we ons ten slotte op de vraag in hoeverre de effecten van verschillende dimensies van netwerkactiviteit op de prestaties van scholen in het Nederlandse primair onderwijs gemedieerd worden door intermediaire variabelen (*Deelvraag 4*). We onderzoeken of de effecten van opwaarts, zijwaarts, en naar buiten netwerken op prestaties gemedieerd worden door neerwaarts netwerken.

Hoofdstuk 6 van dit proefschrift bevat een algemene conclusie waarin de bevindingen van de afzonderlijke hoofdstukken en de implicaties daarvan worden besproken. Ook formuleren we in dit hoofdstuk aanbevelingen voor vervolgonderzoek. Hieronder volgt eerst een korte uiteenzetting over de context van het onderzoek en de dataverzameling. Vervolgens worden per hoofdstuk de achtergrond, opzet en de belangrijkste bevindingen op een rijtje gezet.

CONTEXT EN DATAVERZAMELING

In dit proefschrift onderzoeken we Nederlandse schoolleiders in het primair onderwijs. Ondanks het feit dat het bestuur van de school (het bevoegd gezag) eindverantwoordelijk is voor alles wat zich in de school afspeelt, stellen veel besturen zich terughoudend op en laten ze veel beslissingsruimte over aan de scholen zelf. Het takenpakket van Nederlandse schoolleiders bestaat onder andere uit de kwaliteitszorg, het curriculum, de aanschaf van leermiddelen, het houden van functioneringsgesprekken met leraren, en het opstellen van de schoolgids, het schoolplan en de schoolbegroting. Schoolleiders hebben ook aanzienlijke administratieve taken, zoals de financiële-, leerling- en personeelsadministratie. Tot slot zijn schoolleiders ook de belangrijkste vertegenwoordigers van de school en onderhouden contacten met diverse actoren en organisaties in de omgeving van de school.

Om onze onderzoeksvragen te beantwoorden, maken we gebruik van data die afkomstig zijn van een landelijke vragenlijst onder alle bijna 7000 schoolleiders in het primair onderwijs. Ronde 1 van de vragenlijst is afgenomen in 2010 en Ronde 2 is afgenomen in 2013. In Hoofdstuk 2, 3 en 5 maken we gebruik van de data van Ronde 1 en in Hoofdstuk 4 maken we gebruik van de data van Ronde 2. Tijdens Ronde 1 heeft 19,55% van alle schoolleiders meegewerkt aan het onderzoek. De respons ratio van Ronde 2 was 13,29%. We ondervroegen de schoolleiders over

tal van managementactiviteiten, waaronder hun externe netwerkactiviteit naar meer dan 40 verschillende typen van externe organisaties en instellingen die we op basis van kwalitatieve interviews hadden onderscheiden. Vervolgens hebben we de antwoorden gekoppeld aan de gemiddelde Cito scores van leerlingen. Deze gemiddelde Cito scores van leerlingen worden in dit proefschrift gebruikt om de prestaties van scholen te meten. In onze verklaring van de schoolprestaties hebben we de kenmerken van de school en schoolpopulatie meegenomen. Zo hebben we rekening gehouden met schooldenominatie, het aantal leerlingen, en het percentage achterstandsleerlingen.

RESULTATEN

Dimensies van netwerkactiviteit

De eerste deelvraag van dit proefschrift is gericht op het onderscheiden van verschillende dimensies van netwerkactiviteit in de context van het Nederlandse primair onderwijs. In dit proefschrift maken we in elk empirisch hoofdstuk een theoretisch onderscheid tussen de vier onderscheiden netwerkoriëntaties: opwaarts, neerwaarts, naar buiten, en zijwaarts. *Opwaarts* netwerken is geoperationaliseerd als de contactfrequentie tussen schoolleiders en het schoolbestuur. *Neerwaarts* netwerken wordt gemeten als de frequentie van het aantal overlegmomenten tussen de schoolleider en stafleden met betrekking tot diverse school gerelateerde onderwerpen, zoals de kwaliteit van het onderwijs, leerresultaten en opbrengsten, kwaliteitszorg, het personeels- en arbeidsvoorwaardenbeleid en huisvesting. *Naar buiten* netwerken is geoperationaliseerd als de contactfrequentie tussen schoolleiders en drie typen externe actoren: nationale overheidsorganisaties (zoals de Inspectie van het Onderwijs en DUO), lokale overheidsorganisaties (zoals de gemeentelijke dienst onderwijs en wethouders), en belangengroepen (zoals vakbonden en de PO-raad). Onderzoek op het gebied van de bestuurskunde en organisatiewetenschappen dat zich richt op (publiek) management maakt onderscheid tussen opwaarts, neerwaarts, en naar buiten managen. In dit proefschrift voegen we hier de "zijwaartse" oriëntatie aan toe. Immers, schoolleiders zijn ook afhankelijk van de samenwerking met "peers," zoals andere schoolleiders, de medezeggenschapsraad en de ouderraad. *Zijwaarts* netwerken wordt gemeten als de contactfrequentie met deze coproducenten.

Om de validiteit van deze netwerkdimensies te toetsen, gebruiken we Mokken schaalanalyse in plaats van de in de bestuurskunde meer gebruikelijke klassieke testtheorie (factoranalyse en betrouwbaarheidsanalyse). Mokken schaalanalyse is een cumulatieve schaaltechniek die de hiërarchie in netwerkactiviteit met (in dit geval) externe organisaties en actoren zichtbaar maakt. In het geval van een consistente cumulatieve schaal kunnen we ervan uitgaan dat de relaties met bepaalde actoren meer tijd, inspanning en investering vereisen dan

relaties met andere actoren. De resultaten van de Mokken schaalanalyse laten zien dat de eerder genoemde operationaliseringen consistente dimensies van netwerkactiviteit zijn.

Netwerken en veranderingen in de omgeving (Hoofdstuk 2)

In de eerste twee empirische hoofdstukken van dit proefschrift bestuderen we in hoeverre de verschillende dimensies van netwerkactiviteit de effecten van bedreigingen in de omgeving van de school op de prestaties modereren (*Deelvraag 2*).

In Hoofdstuk 2 onderzoeken we in hoeverre het opwaarts, neerwaarts, zijwaarts, en naar buiten netwerken van schoolleiders de effecten van shocks in de omgeving op de prestaties van hun basisschool modereren. Shocks zijn geconceptualiseerd als veranderingen in leerlingaantallen. De verandering in het leerlingenaantal wordt gemeten als de procentuele verandering van het aantal leerlingen van het ene schooljaar ten opzichte van het jaar daarvoor.

Onderzoek uit de bestuurskunde en organisatiewetenschappen dat zich richt op (publiek) management en prestaties verwacht over het algemeen een negatief effect van veranderingen in de taakomgeving van publieke organisaties. Het bestaande onderzoek stelt dat hoe heviger de verandering in de taakomgeving van de organisatie, hoe slechter de organisatie presteert. Dit wordt verwacht omdat dergelijke veranderingen de stabiliteit van de interne omgeving van de organisatie verstoren. Een verandering van het leerlingenaantal kan bijvoorbeeld een negatief effect hebben op de stabiliteit van het onderwijs, de stabiliteit van de financiële middelen en faciliteiten van de school, en de stabiliteit van het personeel. Deze negatieve effecten van veranderingen in de omgeving op prestaties kunnen echter verminderd worden door de relaties die managers onderhouden. Relaties in de externe omgeving bieden belangrijke hulpbronnen en informatie die een organisatie in staat stellen om in te spelen op externe veranderingen. Het managen van de relaties in de interne omgeving van een organisatie, aan de andere kant, zorgt voor meer interne stabiliteit. Interne netwerkactiviteiten met stafleden helpen bijvoorbeeld bij het bereiken van consensus over (nieuwe) doelen; de coördinatie en allocatie van personen, taken en middelen; en het implementeren van innovaties.

Op basis van deze theoretische verwachtingen worden in Hoofdstuk 2 vijf hypothesen afgeleid voor de prestaties van basisscholen. Allereerst verwachten wij dat de procentuele verandering van het aantal leerlingen een negatief effect heeft op de prestaties van scholen in het primair onderwijs. Daarnaast verwachten we dat opwaarts, neerwaarts, zijwaarts en naar buiten netwerken de negatieve effecten van veranderingen in het aantal leerlingen op de prestaties modereren.

Deze hypothesen worden getoetst op een longitudinale dataset van 546 basisscholen. De multilevel analyses laten zien dat de procentuele veranderingen van het aantal leerlingen de gemiddelde Cito scores van scholen inderdaad negatief beïnvloeden. Bovendien vinden wij sterke ondersteuning voor de verwachting dat neerwaarts netwerken met stafleden en zijwaarts netwerken met coproducenten deze negatieve effecten op gemiddelde Cito scores

verminderen. Opwaarts en naar buiten netwerken verminderen de negatieve effecten van veranderingen in het leerlingenaantal op gemiddelde Cito scores echter niet.

Deze resultaten dragen op een aantal punten bij aan onze bestaande kennis van publiek management. Allereerst is het een van de weinige studies naar verschillende management oriëntaties bij het managen van veranderingen in de externe omgeving van organisaties. Eerdere studies concentreerden zich op de relaties in de externe omgeving van de organisaties. De resultaten laten zien dat voor managers van publieke organisaties het functioneel kan zijn om een sterkere nadruk te leggen op het interne management van hun organisatie wanneer schokken optreden vanuit de omgeving. Ten tweede zijn de resultaten afgeleid van objectieve (in plaats van gebruikelijke subjectieve) gegevens over externe veranderingen en prestaties. Daarmee bieden zij een meer geobjectiveerd inzicht ten opzichte van bestaande studies in de bestuurskunde.

Netwerken en restricties uit de omgeving (Hoofdstuk 3)

In Hoofdstuk 3 onderzoeken we in hoeverre opwaarts, neerwaarts, zijwaarts, en naar buiten netwerken de effecten van restricties in de omgeving op de prestaties van organisaties modereren. Waar externe schokken onomkeerbaar en moeilijk te voorspellen zijn, zijn externe restricties beter voorspelbaar en manipuleerbaar. Het is daarom waarschijnlijk dat restricties uit de omgeving anders gemanaged dienen te worden dan externe schokken. Het onderzoek in Hoofdstuk 3 concentreert zich op restricties in de vorm van belastende regels en voorschriften die schadelijk zijn voor het functioneren van organisaties. Dergelijke regeldruk worden aangeduid met de term bureaucratisme, of "red tape" in het Engels. Kenmerkend voor dergelijke regels is dat ze van kracht blijven, en dus energie kosten om na te leven, zonder dat de legitieme doeleinden van de regels gediend worden.

De bestuurskundige kennis van de "ontaarding" van de bureaucratie veronderstelt over het algemeen dat bureaucratisme een negatief effect heeft op de prestaties van publieke organisaties. Naleving van belastende en redundante regels is een verspilling van tijd en energie, en resulteert in organisatorische ineffectiviteit en verlies van moraal binnen de organisatie. Wanneer scholen veel tijd en energie stoppen in het naleven van redundante, belastende regels is dit nadelig voor de kwaliteit van onderwijs. Onderzoek op het gebied van de bestuurskunde en organisatiewetenschappen dat zich richt op (publiek) management en prestaties verwacht echter dat managers bureaucratisme kunnen beïnvloeden en de negatieve gevolgen van deze administratieve rompslomp kunnen neutraliseren. Allereerst bieden relaties met regel-opleggende actoren en organisaties toegang tot feedback over belastende regels. Deze feedback vermindert de kans op onjuiste toepassingen van regels, miscommunicatie en tegenstrijdigheden in de interpretaties van regels. Tevens kan feedback het gevoel van eigenaarschap van de regels vergroten. Ten tweede kunnen managers de negatieve effecten van bureaucratisme opvangen door feedback relaties te onderhouden met actoren in de

interne omgeving van de organisatie. Door te communiceren over externe regelgeving en het stellen van haalbare doelen en taken, kunnen managers voorkomen dat stafleden schaarse middelen besteden om te voldoen aan extern opgelegde regels.

Voortbouwend op deze theoretische verwachtingen worden in Hoofdstuk 3 vijf hypothesen afgeleid. Allereerst wordt de theoretische verwachting geformuleerd dat bureaucratisme een negatief effect heeft op de prestaties van scholen in het primair onderwijs. Daarnaast wordt de theoretische verwachting geformuleerd dat opwaarts, neerwaarts, zijwaarts en naar buiten netwerken de negatieve effecten van bureaucratisme op de prestaties verminderen.

Deze hypothesen worden getoetst op een longitudinale dataset van 523 basisscholen. Bureaucratisme wordt gemeten door schoolleiders te vragen naar de perceptie van bureaucratisme. We maken daarbij onderscheid tussen algemeen bureaucratisme (in het Engels: "general red tape") en bureaucratisme met betrekking tot personeelsbeleid (in het Engels: "personnel red tape"). De multilevel analyse laat zien dat bureaucratisme met betrekking tot personeelsbeleid de gemiddelde Cito scores van scholen negatief beïnvloeden. Bovendien laten de resultaten zien dat naar buiten netwerken met nationale overheidsorganisaties, lokale overheidsorganisaties en belangengroepen het negatieve effect van personele regeldruk vermindert. De andere netwerkoriëntaties verminderen het negatieve effect van personele regeldruk niet.

Interessant is dat algemeen bureaucratisme een positief effect heeft op de gemiddelde Cito scores van scholen. Een verklaring voor dit onverwachte effect zou kunnen zijn dat de variabele "algemeen bureaucratisme" een algeheel gevoel van onvrede over bureaucratie meet, in plaats van in hoeverre managers ervaren dat externe regels processen onnodig complex maken en daarmee belemmerend zijn om doelen te bereiken.

De resultaten van het onderzoek uit Hoofdstuk 3 dragen bij aan het onderzoek naar publiek management en prestaties door aan te tonen dat bureaucratisme de prestaties van een organisatie negatief beïnvloedt. Hoewel algemeen wordt aangenomen dat bureaucratisme schadelijk is voor het functioneren van publieke organisaties, is deze hypothese slechts in een beperkt aantal studies getoetst. De resultaten laten ook zien dat managers het vermogen hebben om (de negatieve effecten van) bureaucratisme te verminderen. De resultaten dragen daarnaast bij aan de discussie over hoe bureaucratisme gemeten dient te worden. Zij dringen aan op een sterkere nadruk op de kwaliteit van regels in plaats van het bestuderen van de algemene perceptie van bureaucratisme.

Netwerken en prestatiemanagement (Hoofdstuk 4)

In Hoofdstuk 4 van dit proefschrift bestuderen we in hoeverre verschillende dimensies van netwerkactiviteit de effecten van andere management activiteiten op de prestaties van scholen modereren (*Deelvraag 3*). Specifiek onderzoeken we in hoeverre opwaarts, neerwaarts, zijwaarts, en naar buiten netwerken de effecten van prestatiemanagement op prestaties versterken.

De uit de New Public Management (NPM) afkomstige gedachte dat publieke organisaties de prestaties van hun organisatie dienen te meten en deze informatie dienen te gebruiken om zo geïnformeerde beleidsbeslissingen te kunnen nemen en de organisatie proactief te kunnen managen, is uitgegroeid tot een kernelement van de hervormingen van de publieke sector. Naast de traditionele focus op het management van hulpbronnen, organisatiestructuur en processen, richt prestatiemanagement zich op het management van resultaten. In het primair onderwijs in Nederland staat dit principe ook wel bekend als "opbrengstgericht werken".

Op basis van de input van (bijvoorbeeld op nationaal vastgestelde) referentieniveaus en feedback op eerdere prestaties, stellen publieke managers de prestatiedoelstellingen van hun organisatie vast en nemen zij vervolgens actie om deze doelstellingen te bereiken. Na verloop van tijd meet de publieke manager de prestaties met behulp van gepaste prestatie-indicatoren. Informatie over de prestaties wordt vervolgens geëvalueerd door de organisatie zelf, alsmede door externe stakeholders (zoals toezichthouders), en wanneer nodig worden de nationale referentieniveaus en/of de prestatie-doelstellingen van de organisatie aangepast. De voornaamste doelen van prestatiemanagement zijn dan ook instrumenteel van aard: (1) het verbeteren van de prestaties van de organisatie en (2) het bevorderen van transparantie naar/verantwoording aan stakeholders. Bestuurskundig onderzoek dat zich richt op publiek management en prestaties van publieke organisaties formuleert dan ook de verwachting dat prestatiemanagement een positief effect heeft op de prestaties. Recente theoretische inzichten uit de bestuurskunde wijzen op het versterkende effect van netwerken op prestatiemanagement. Dit wordt verwacht omdat relaties met andere actoren en organisaties toegang bieden tot informatie over nationale referentieniveaus en het gebruik van prestatie-indicatoren, en een organisatie in staat stellen om prestatie-informatie te vertalen in duidelijke en haalbare doelen.

Voortbouwend op deze theoretische verwachtingen worden in Hoofdstuk 4 vier hypothesen afgeleid. Allereerst wordt de verwachting geformuleerd dat prestatiemanagement een positief effect heeft op de prestaties van scholen in het primair onderwijs. Daarnaast wordt de verwachting geformuleerd dat opwaarts, neerwaarts, en naar buiten netwerken de positieve effecten van prestatiemanagement versterken.

Deze hypothesen worden vervolgens getoetst op een longitudinale dataset van 543 basisscholen. Prestatiemanagement wordt gemeten door schoolleiders te vragen welke indicatoren zij gebruiken om opbrengstgericht te werken en hoe lang zij die indicatoren al in gebruik hebben. Een multilevel analyse laat zien dat, in tegenstelling tot onze verwachtingen, een toename van het aantal instrumenten van het ene schooljaar ten opzichte van het jaar daarvoor een *negatief* effect heeft op de gemiddelde Cito scores van scholen. Het gebruik van prestatie-indicatoren is in eerste instantie positief, maar slaat om in een negatief effect wanneer het gebruik van het aantal prestatie-indicatoren toeneemt. Daarnaast vinden we geen empirische steun voor de hypothese dat opwaarts, neerwaarts, en naar buiten netwerken het effect van prestatiemanagement versterkt. Opwaarts netwerken (contact met het school

bestuur) blijkt zelfs het negatieve effect van prestatiemanagement op prestaties te versterken.

Deze resultaten zijn evenwel in lijn met de gedachten van een alternatieve stroming binnen de bestuurskunde; een die het gebruik van NPM principes door publieke organisaties bekritiseert. De literatuur uit deze stroming biedt een mogelijke verklaring voor dit interessante resultaat: de ongrijpbaarheid van doelstellingen van publieke organisaties. Publieke organisaties hebben vaak veel doelen en sommige doelen kunnen tegenstrijdig zijn. Omdat het voor publieke managers lastig is om te bepalen welke doelstellingen—of prestatie-indicatoren—het belangrijkst zijn, kan het gebruik van teveel prestatie-indicatoren de evaluatie van prestatie-informatie dwarsbomen, en uiteindelijk de prestaties van een organisatie negatief beïnvloeden. Het resultaat dat contact met het schoolbestuur de negatieve effecten van prestatiemanagement versterkt, zou daarom verklaard kunnen worden door het idee dat schoolbesturen het gebruik van prestatie-indicatoren zo veel mogelijk stimuleren. Het stimuleren van het gebruik van prestatie-indicatoren zou verklaard kunnen worden door de principaal-agent relatie tussen het bestuur en de schoolleider. Een andere mogelijke verklaring is dat te veel managementactiviteiten slecht zijn voor de prestaties van organisaties. Verder onderzoek is nodig om deze mechanismen meer in detail te onderzoeken.

Het indirecte effect van netwerken (Hoofdstuk 5)

In Hoofdstuk 5 van dit proefschrift bestuderen we in hoeverre de effecten van verschillende dimensies van netwerkactiviteit op de prestaties van scholen in het Nederlandse primair onderwijs gemedieerd worden door intermediaire variabelen (*Deelvraag 4*). Meer specifiek onderzoeken we of de effecten van opwaarts, zijwaarts, en naar buiten netwerken op prestaties gemedieerd worden door neerwaarts netwerken.

Bestuurskundig en organisatiewetenschappelijk onderzoek dat zich richt op (publiek) management en prestaties vindt zijn oorsprong in het "open systeem perspectief" (in het Engels: "open systems perspective"). De kernelementen van een organisatie als een open systeem zijn "invoer" (in het Engels: "input"), "doorvoer" (in het Engels: "throughput") en "uitvoer" (in het Engels: "output"). Volgens het open systeem perspectief faciliteert het management van een organisatie het transformatieproces van hulpbronnen en restricties tot producten die worden geleverd en diensten die worden verleend door de organisatie. Het management van de organisatie is verantwoordelijk voor verzamelen van hulpbronnen en informatie over restricties, maar vervolgens ook voor het coördineren en alloceren van personen, taken en middelen binnen de organisatie. De manager fungeert immers als schakel—of "boundary spanner" in het Engels—tussen de externe en interne omgeving van een organisatie. Hoe goed een manager dit proces faciliteert is van invloed op de prestaties van een organisatie, zo luidt de verwachting.

In dit hoofdstuk wordt onderzocht in hoeverre neerwaarts netwerken de effecten van opwaarts, zijwaarts, en naar buiten netwerken op prestaties medieert. Het idee is dat succesvol

neerwaarts netwerken, stafleden, zoals leraren en ondersteunende staf, beter in staat stelt om hulpbronnen en restricties te transformeren tot kwalitatief hoogwaardig onderwijs. Deze hulpbronnen worden verworven—en informatie over restricties wordt ingewonnen—door middel van de opwaarts, zijwaarts, en naar buiten georiënteerde netwerkactiviteiten van de schoolleider. Op basis van deze theoretische verwachtingen wordt in Hoofdstuk 5 één "doorvoer-hypothese" (in het Engels: "throughput hypothesis") afgeleid.

De hypothese wordt getoetst op een longitudinale dataset van 547 basisscholen. Zoals eerder vermeld, wordt neerwaarts netwerken gemeten als de frequentie van het aantal overlegmomenten tussen de schoolleider en stafleden met betrekking tot diverse school gerelateerde onderwerpen, zoals de kwaliteit van het onderwijs, leerresultaten en opbrengsten, kwaliteitszorg, het personeels- en arbeidsvoorwaardenbeleid en huisvesting. De pad-analyse laat zien dat de effecten van opwaarts netwerken met het schoolbestuur, zijwaarts netwerken met coproducenten en naar buiten netwerken met nationale overheidsorganisaties op de gemiddelde Cito scores van scholen gemedieerd worden door neerwaarts netwerken met stafleden. De indirecte effecten van zijwaarts netwerken met lokale overheidsorganisaties en belangengroepen op de gemiddelde Cito scores van scholen zijn niet significant.

Deze resultaten dragen op een belangrijk punt bij aan bestaande bestuurskundige inzichten over publiek management. Zij tonen duidelijk aan dat om meer kennis te krijgen over de effecten van de "boundary spanning" activiteiten van publieke managers op prestaties, het nodig is om het hele invoer-doorvoer-uitvoer proces in ogenschouw te nemen. De meeste eerdere studies concentreerde zich echter alleen op de empirische samenhang tussen kenmerken van de invoer en kenmerken van de uitvoer. Het betrekken van indirecte effecten via de doorvoer laat een diepere causale verklaring zien dan huidige studies.

ALGEMENE CONCLUSIES EN AANBEVELINGEN

Hoofdstuk 6 bespreekt in hoeverre de hoofdvraag en deelvragen zijn beantwoord en behandelt de algemene conclusies. Daarnaast worden in Hoofdstuk 6 aanbevelingen gedaan voor vervolgonderzoek naar de relatie tussen netwerken en prestaties. Wij vatten hier deze conclusies en aanbevelingen kort samen.

Ten eerste—en betrekking hebbend op het eerste subdoel—kan worden gesteld dat netwerkactiviteit een multidimensionaal concept is. In elk empirisch hoofdstuk is er een theoretisch onderscheid gemaakt tussen vier netwerkoriëntaties: opwaarts, neerwaarts, naar buiten, en zijwaarts netwerken. Allereerst laten Mokken schaalanalyses laten zien dat de operationaliseringen van deze dimensies consistente netwerkschalen zijn. Ten tweede laten de resultaten uit de empirische hoofdstukken zien dat de verschillende netwerkoriëntaties ieder op een eigen manier bijdragen aan de prestaties van scholen. De resultaten bevestigen

onze assumptie dat een multidimensionale benadering van netwerkactiviteit een sterkere theoretische onderbouwing biedt voor de studie van de effecten van netwerkactiviteit op prestaties.

Een tweede algemene conclusie is dat bedreigingen in de omgeving van organisaties de prestaties van organisaties negatief beïnvloeden. Hoofdstuk 2 laat zien dat "shocks"—geoperationaliseerd als de procentuele verandering van het aantal leerlingen—de prestaties van scholen negatief beïnvloeden. Daarnaast laten de resultaten uit Hoofdstuk 3 zien dat restricties—geoperationaliseerd als de perceptie van bureaucratisme—ook een negatief effect hebben op schoolprestaties. Over het geheel genomen laten de resultaten zien dat, in aanvulling op verklaringen voor prestaties op organisatieniveau, het belangrijk is een sterkere nadruk te leggen op de externe omgeving van organisaties.

Een ander belangrijke conclusie is dat de netwerkactiviteiten van schoolleiders de negatieve effecten van bedreigen uit de omgeving kunnen verminderen. Zo laat Hoofdstuk 2 zien dat neerwaarts netwerken met stafleden en zijwaarts netwerken met coproducenten het negatieve effect van "shocks" in de omgeving verminderen. Uit Hoofdstuk 3 blijkt dat het negatieve effect van restricties uit de omgeving exclusief verminderd wordt door naar buiten netwerken met nationale- en lokale overheidsorganisaties en belangengroepen. Het grootste verschil tussen schokken en restricties is dat schokken moelijker te voorspellen en te beïnvloeden zijn. Het is gemakkelijker voor managers om restricties te manipuleren en zo een gunstigere omgeving te creëren. De resultaten suggereren dat de mechanismen die ten grondslag liggen aan de modererende functies van de verschillende netwerkoriëntaties afhankelijk zijn van de voorspelbaarheid van bedreigingen uit de omgeving. Verder onderzoek is nodig om deze mechanismen meer in detail te onderzoeken.

Ten vierde kan worden gesteld dat bepaalde netwerkactiviteiten van schoolleiders de negatieve effecten van prestatiemanagement versterken. Hoofdstuk 4 laat zien dat prestatiemanagement een negatief effect heeft op de schoolprestaties en dat opwaarts netwerken met het schoolbestuur dit negatieve effect versterkt. Dit resultaat suggereert dat bepaalde managementactiviteiten botsen. Bestuurskundig onderzoek dat zich richt op de interacties tussen verschillende managementactiviteiten is echter beperkt. Hier ligt een kans voor vervolgonderzoek.

Het laatste algemene resultaat is dat de netwerkactiviteiten de prestaties van organisaties indirect beïnvloeden. Hoofdstuk 5 laat zien dat de effecten van opwaarts, zijwaarts en naar buiten netwerken op schoolprestaties gemedieerd worden door neerwaarts netwerken. Dit resultaat suggereert dat managers een actieve rol spelen bij het transformatieproces van hulpbronnen en restricties tot producten die worden geleverd en diensten die worden verleend door de organisatie. Vervolgonderzoek is nodig om meer inzicht te krijgen in deze "doorvoer" functie van publiek management.

Op basis van de belangrijkste beperkingen van dit proefschrift worden in Hoofdstuk 6

ten slotte een aantal bijkomende aanbevelingen gedaan voor vervolgonderzoek. Een eerste beperking betreft de operationalisatie van het concept netwerkactiviteit. In dit proefschrift is netwerkactiviteit geoperationaliseerd als de intensiteit van het netwerkgedrag met diverse typen actoren en organisaties. Deze operationalisering houdt echter geen rekening met het motief voor deze netwerkactiviteiten alsmede de wezenlijke inhoud van het contact. Vervolgonderzoek zou zich meer moeten focussen op de operationalisering van netwerkactiviteit.

In dit proefschrift bestuderen we in hoeverre netwerkactiviteit van invloed is op de prestaties van een organisatie. De prestaties van een organisatie zouden echter ook beïnvloed kunnen worden door eerdere prestaties. In dit proefschrift houden we rekening met eventuele omgekeerde causaliteit tussen netwerkactiviteit en prestaties door te controleren voor prestaties uit het verleden. Vervolgonderzoek zou zich echter moeten richten op de wisselwerking tussen netwerkactiviteit en prestaties.

De prestaties van publieke organisaties kunnen onderverdeeld worden in diverse dimensies, zoals efficiëntie, effectiviteit, responsiviteit, en klanttevredenheid. In dit onderzoek maken we echter gebruik van één dimensie, namelijk effectiviteit. Effectiviteit wordt gemeten door middel van de gemiddelde Cito scores van leerlingen. Vervolgonderzoek zou meerdere prestatiedimensies moeten meten om meer te weten te komen over de effecten van netwerkactiviteit op andere prestatiedimensies.

Ten slotte onderzoekt dit proefschrift de effecten van twee bedreigingen “shocks” en “restricties” los van elkaar. In werkelijkheid kunnen organisaties echter te maken hebben met meerdere bedreigingen tegelijkertijd. Een laatste aanbeveling betreft de simultane analyse van verschillende soorten bedreigingen uit de omgeving van een organisatie.

PRAKTISCHE IMPLICATIES

De bevindingen van dit proefschrift hebben enkele belangrijke praktische implicaties voor schoolleiders en schoolbesturen. Ten eerste wijzen de resultaten op het belang van het monitoren van de omgeving van de school. De resultaten van dit proefschrift laten zien dat bedreigingen uit de omgeving van de school de schoolprestaties negatief kunnen beïnvloeden. De resultaten tonen echter ook aan dat schoolleiders in staat zijn om deze negatieve effecten te verminderen door relaties te onderhouden met specifieke actoren en organisaties die helpen bij het verwerken van specifieke bedreigingen. Door de omgeving te monitoren kunnen schoolleiders in kaart brengen welke omgevingsfactoren—zoals politieke, economische, sociale, technologische, ecologische, en juridische factoren—aan verandering onderhevig zijn. Vervolgens dienen schoolleiders op basis van deze informatie de strategie van de school te bepalen. Als we het hebben over extern management, dan betekent dit dat

schoolleiders dienen te anticiperen op veranderingen in de omgeving en proactief relaties dienen te onderhouden met externe organisaties en instellingen die helpen bij het omgaan met specifieke omgevingsveranderingen door middel van het voorzien kennis, informatie, en/of financiële middelen. Het is daarbij wel van belang dat schoolleiders weten waar ze "moeten kijken". Een advies voor schoolbesturen is om in cursussen te investeren die erop gericht zijn schoolleiders te leren hoe zij de omgeving van hun school efficiënt en effectief kunnen monitoren en passende maatregelen kunnen nemen op basis van informatie uit de omgeving.

De tweede implicatie van dit proefschrift heeft betrekking op het monitoren van de prestaties van scholen. Prestatiemanagement is gebaseerd op de gedachte dat publieke organisaties de prestaties van hun organisatie dienen te meten en deze informatie dienen te gebruiken om zo geïnformeerde beleidsbeslissingen te kunnen nemen ten gunste van de prestaties van de organisatie. De resultaten van dit proefschrift suggereren echter dat er grenzen zijn aan het effect van prestatiemanagement op prestaties en dat prestatiemanagement zelfs perverse effecten kent. We vinden dat het gebruik van prestatie-indicatoren in eerste instantie positief is, maar omslaat in een negatief effect wanneer schoolleiders meer prestatie-indicatoren gaan gebruiken. Het lijkt vooral belangrijk te zijn dat schoolleiders gebruik maken van een beperkt aantal prestatie-indicatoren die hetzelfde (of een vergelijkbaar) prestatiedoel meten, in plaats van legio prestatie-indicatoren met tegenstrijdige doelen. Ook hier een advies voor schoolbesturen om te investeren in cursussen die erop gericht zijn schoolleiders vaardig te maken in het opbrengstgericht werken in plaats van louter het stimuleren van het gebruik van prestatie-indicatoren.

Curriculum Vitae

Curriculum vitae

Petra van den Bekerom was born in Venray, the Netherlands, on the 8th of May1984. In 2007 she obtained a Bachelor's degree in Communication at the Fontys University of Applied Sciences. She then enrolled in the (Pre-) Master program Policy and Organization Studies at the Department of Sociology at Utrecht University, and obtained her Master's degree in 2009. After graduation, she was employed as a junior researcher and teacher at the same department. In 2010 she started her PhD project at the Interuniversity Center for Social Science Theory and Methodology (ICS) at the Department of Sociology at Utrecht University. In November 2011, the project was moved to the Institute of Public Administration at Leiden University. There she conducted the present research from 2011 to 2015. In 2015, she was a visiting scholar at the Department of Political Science at Texas A&M University. As of March 2016, she is employed as an assistant professor of public administration at the Institute of Public Administration at Leiden University.

Public organizations are responsible for the delivery and provision of public services on which citizens rely. To maintain the quality of or improve these services, public organizations must exploit resources, such as monetary resources, raw materials, human activity, information, influence, and power, from the environment of the organization. To attain a predictable and controllable flow of resources, public managers must interact with a wide array of different organizations and actors in the organization's environment that are potential sources of support.

The main question of this dissertation concerns the conditions under which public managers' interactions with organizations and actors in the environments of their organizations contribute to organizational performance. The context of this study is Dutch primary education. Specifically, we study the networking activities of Dutch primary school principals.

One of the main conclusions of this dissertation is that specific managerial networking activities moderate the negative effect of specific environmental challenges. We find, for example, that the negative effect of red tape on school performance is attenuated by school principals' networking activities with external organizations, such as local- and national government organizations and interest groups.

The results of this dissertation provide valuable insights for researchers in the field of public management and organization studies. The results also have practical implications for managers and professionals in the public sector. Insights into the conditions under which specific managerial networking activities are beneficial can help public managers make strategic decisions about which networking activities to prioritize in certain situations.

Petra van den Bekerom holds a bachelor's degree in Communication from Fontys University of Applied Sciences and a master's degree in Sociology from Utrecht University. The present study was conducted at the Interuniversity Center for Social Science Theory and Methodology (ICS) at Utrecht University and at the Institute of Public Administration at Leiden University. Currently, she is employed as an assistant professor at the Institute of Public Administration at Leiden University.