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# Ambidexterity and Public Organizations: A Configurational Perspective

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**ABSTRACT**

A general assumption in public sector research is that public organizations have to be efficient and innovative to overcome challenges such as demographic changes and digitization. This argument has been discussed in light of ambidexterity theory, for example. However, only little public sector research has focused on "how" public organizations reach ambidexterity. We take this question into account and focus on design and leadership conditions that are necessary or sufficient for ambidexterity. More precisely, the main question of this article is: Which combination of leadership and design conditions plays a role for ambidexterity in public organizations? We theoretically rely on the concept of ambidexterity, collected data in Belgian public cultural centers, and analyzed the data via the set-theoretic method Qualitative Comparative Analysis (QCA). We can conclude from our analysis that six different combinations of design and leadership conditions were found to be sufficient for ambidexterity in our dataset. What is more is that public organizations combine design and leadership conditions of both structural and contextual ambidexterity to balance simultaneously exploitation and exploration. Hereby this article provides new theoretical and empirical insights and offers opportunities for further ambidexterity research in public organizations.

It is argued that public organizations have to be simultaneously efficient and innovative if they want to overcome today's challenges (e.g., Aagaard, 2011; Bakhshi & Throsby, 2009; Bryson, Boal, & Rainey, 2008; Cannaerts, Segers, & Henderickx, 2016; Rinaldi, Montanari, & Bottani, 2015). Challenges for the public sector come forth from economic, social, demographic, and environmental changes that demand the public sector to deal with contradictory elements (Deserti & Rizzo, 2014). On the one hand, there is the necessity to be efficient and thus to be concerned about fiscal

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sustainability, to respond to the growing demands of citizens, and to lower costs (Rinaldi et al., 2015). On the other hand, under the influence of New Public Management and New Public Governance innovation is more and more seen as one of the major tools to increase productivity and to effectively press societal challenges such as growing citizens expectations, globalization, demographic and climate challenges, and thus as a tool to enhance economic growth (Bakhshi & Throsby, 2009; Bason, 2010; Choi & Chandler, 2015; Liddle, 2013; Umans, Smith, Andersson, & Planken, 2018). Hence, to keep an organization viable, the existence of both efficiency and innovation is necessary.

We follow authors such as Cannaerts et al. (2016), Palm and Lilja (2017), and Uhl-Bien and Arena (2018) and put the theoretical framework of ambidexterity to the forefront to explore how public organizations simultaneously balance efficiency and innovation. The core tension in ambidexterity has been described as efficiency versus innovation (Papachroni, Heracleous, & Paroutis, 2016). More precisely, ambidexterity describes the capability of organizations to simultaneously perform and balance different and often conflicting activities, such as exploitation and exploration (Simsek, Heavey, Veiga, & Souder, 2009). In short, exploitation is considered the efficient pursuit of existing activities, whereas exploration is associated with the flexibility to focus on new ideas, innovation (March, 1991).

Although the argument has been made that concepts of organization studies, such as ambidexterity, can be easily transferred to the public context, more research focusing on ambidexterity and public organizations is necessary to generalize private-sector research to the unique public management context (Kobarg, Wollersheim, Welpe, & Spörrle, 2017). Limited research focusing on ambidexterity in public organizations has mainly focused on ambidexterity as an outcome, some focused on its antecedents while others have taken a leadership approach or focused on individual ambidexterity (Umans et al., 2018). Research so far has indicated that ambidexterity is a useful concept to understand the nonfinancial outcomes of public sector organizations (Umans et al., 2018). Furthermore, it is argued that for higher public service performance, public organizations have to optimize but also innovate their services and processes (Gieske, George, van Meerkerk, & van Buuren, 2019). Quantitative empirical research has shown that ambidextrous public organizations run fewer risks of overoptimizing, and are better in balancing optimization and innovation (Gieske et al., 2019).

What is, however, missing is insight into how ambidexterity can be achieved in public organizations or under which conditions it emerges (Umans et al., 2018). So far, little reflection has been made on how public organizations can simultaneously balance efficiency and innovation (e.g., Cannaerts et al., 2016; Choi & Chandler, 2015; Deserti & Rizzo, 2014; Palm

& Lilja, 2017; Smith & Umans, 2015). Bryson et al. (2008) argue that there are more or less nine different conditions that increase the possibility of public ambidextrous organizations. Effective strategic leadership and ambidextrous organizational design are two examples (Bryson et al., 2008). First, "Understanding leadership in context is crucial for unpacking the conditions in which executives can make an impact and what leadership is required for creating and maintaining an ambidextrous system" (Yitzhack Halevi, Carmeli, & Brueller, 2015, p. 224). This leadership condition is more recently established in the work of Umans et al. (2018) and Uhl-Bien and Arena (2018). The ability of organizations to become ambidextrous depends on the top management team and its ability to balance the tension between exploitation and exploration (Umans et al., 2018). Tension drives beneficial outcomes, only if managed well, which is a leadership task (Uhl-Bien & Arena, 2018). Although one of the biggest challenges for leaders is to enable organizations to be adaptive, there is only scattered research focusing on the precise role of leadership for adaptability (Uhl-Bien & Arena, 2018). So far, there is still no clarity on whether a more forceful leadership approach, by which only a few senior managers create and communicate a clear vision, works better than enabling leadership in which multiple employees are stimulated to create ambidexterity altogether. Previous ambidexterity research in private and public organizations states that (senior) leaders play a role in simultaneously balancing exploitation and exploration (Kobarg et al., 2017); we examine whether leadership is necessary or sufficient for ambidexterity.

Second, classic perspectives argued that there are two ambidextrous organizational designs to balance simultaneously exploitation and exploration: structural and contextual ambidexterity. Whereas a structural ambidextrous design differentiates between exploitation and exploration units which they integrate at higher hierarchical organization levels (O'Reilly & Tushman, 2013), a contextual ambidextrous design creates a supportive context so that individual employees are stimulated to focus on exploitation and exploration (Gibson & Birkinshaw, 2004). However, a comparative case study of Cannaerts et al. (2016) indicates that there are no "pure" ambidextrous designs, and that elements of both structural and contextual ambidexterity are combined in practice. There is still no solid empirical clarity about which design—structural or contextual ambidexterity—outperforms the other or about how different elements of both designs can be combined (Palm & Lilja, 2017). Hence, the purpose of this article is to explore empirically the role of leadership and design conditions that enable public organizations to achieve ambidexterity. Put differently, *which combination of leadership and design conditions plays a role for ambidexterity in public organizations?*

We use data on Belgian public cultural and community centers, and analyze the data via the set-theoretic method of qualitative comparative analysis (QCA). Cultural and community centers are typical public organizations, since they are structurally created and organized by the government: personnel and infrastructure are embedded in a local municipality (Gosseye, 2012; VVC, 2014). With the method of QCA, we perform configurational comparative research, and thus are able to gain more empirical insight into which conditions are necessary or sufficient for ambidexterity.

Hereby, this article contributes to both ambidexterity theory and public sector management in a threefold way. First, we provide empirical evidence, which until now has been rare (e.g., Cannaerts et al., 2016; Smith & Umans, 2015), on how public sector organizations realize ambidexterity. Second, we explore the usefulness of the classic perspectives—structural and contextual ambidexterity—for public organizations seeking to balance simultaneously exploitation and exploration. Third, with our configurational approach, we answer a call for further elaboration of the theoretical and empirical interplay between diverse leadership and design conditions of structural and contextual ambidexterity (Birkinshaw & Gupta, 2013; Cannaerts et al., 2016). Agostini, Nosella, and Filippini (2016) argue that alternative measurement models are relevant to test in order to enhance understanding of mixed structural and contextual design. Hence, our specific use of QCA enhances the understanding about the configurational relationship between the core conditions of structural ambidexterity and contextual ambidexterity. Using QCA has the advantage that there is no artificial pressure to "one best solution," but multiple causal models that exist among comparable cases are considered valuable solutions (Katz & Kahn, 1978).

We start by reviewing the literature on ambidexterity, design, and leadership conditions. Hereafter, the methodology and data are discussed. Furthermore, we dive deeper into the results of our QCA. Finally, we conclude our article and give recommendations for future research.

## Theoretical framework

### Ambidexterity

Following the work of March (1991, p. 71), ambidexterity is defined as "the ability of organizations to exploit and explore." *Exploitation* is associated with variance reduction; in-depth search for knowledge so that pertinent solutions are created—with refinement, choice, production, efficiency, selection, implementation, execution—resulting in a belief that reproduction leads to future success (March, 1991). *Exploration* is associated with variance increasing activities; trial and error; broad and generalized search;

creativity; flexibility; the quest for new ideas, new markets, new things; risk taking; experimentation; and innovation (March, 1991).

Research regarding ambidexterity in public organizations is still very rare, but, activities relating to exploitation such as efficiency and activities relating to exploration such as innovation are more heavily discussed (Kobarg et al., 2017). Due to the influence of New Public Management, efficiency has been discussed in relation to the introduction of performance management systems which challenges public employees to work efficiently by performing exploitation (Kobarg et al., 2017). *Exploitation* within public organizations refers to a focus on services that mainstream users want (Bryson et al., 2008); it is about "making best use of the resources available for the provision of public services" (Gershon, 2004, p. 6). Innovation has been argued to be of crucial importance for public sector organizations and, more precisely, public service improvement as well as efficacy and efficiency (Kobarg et al., 2017). This is due to the dynamic external environment and disruptive challenges such as digitization and the emergence of the e-government, the upcoming pressure of New Public Management, or sudden legal or policy changes (Kobarg et al., 2017). Specifically, *exploration* within public organizations is associated with the discovery of new products and services, mainly incremental and small-scale innovations, to serve niche customers and with fit to the internal capacity and the demands of the stakeholders (Bryson et al., 2008; Cannaerts et al., 2016). Other explorative activities for public sector employees include introducing new services, designing new software, digital platforms, or new processes to meet the demands of changed legislation (Kobarg et al., 2017).

### Design, leadership, and ambidexterity

Organization design is defined as "the complete specification of strategy, structure, processes, people, coordination and control, and incentive components of the organization" (Burton, Obel, & Håkonsson, 2015, p. 26). Following classic perspectives, ambidexterity can be managed by structurally differentiating exploitation and exploration in separate units and integrating them later—structural ambidexterity (March, 1991). One of the basic assumptions of *structural ambidexterity* is that exploitation and exploration are differentiated in diverse units and that these units have to be integrated by the top management team (TMT) (O'Reilly & Tushman, 2013). Hence, integrating the differentiated units is a leadership task, one handled by senior leaders (O'Reilly & Tushman, 2013; Uhl-Bien & Arena, 2018). Leaders achieve this by creating and communicating a common vision, goals, and values (O'Reilly & Tushman, 2008).

The TMT has to develop capabilities to understand the needs of the differentiated units and to communicate a clear vision throughout the entire organization about the positive impact of the simultaneous pursuit of exploitation and exploration (O'Reilly & Tushman, 2008). Hence, when following these basic assumptions of structural ambidexterity, three conditions can be considered as important to create structural ambidexterity: differentiation, integration, and forceful leadership.

*Differentiation* refers to "differences between departments which arise due to differences in tasks, in goal orientations, time orientations, formality of structures and interpersonal orientations" (Lawrence & Lorsch, 1967, pp. 4–5). Differentiation usually provides benefits, such as improved efficiency, due to the specialized character of each differentiated unit, but it also creates barriers to information sharing and cooperation (Bledow, Frese, Anderson, Erez, & Farr, 2009; Jansen, Tempelaar, Van den Bosch, & Volberda, 2009; Lawrence & Lorsch, 1967; Raisch & Birkinshaw, 2008). These barriers arise because of the diverse structures, cultures, mind-sets, and the like of the differentiated units (Jansen et al., 2009).

To make sure that the TMT can integrate the differentiated units, we argue that a structurally ambidextrous design is characterized by high levels of centralization. *Centralization* refers to the hierarchy of authority and degree of participation in decision making; the former refers to "the extent to which the power to make decisions is exercised at the upper levels of the organizational hierarchy"; the latter is "the degree of employee involvement in the determination of organizational policy" (Andrews, Boyne, Law, & Walker, 2009, p. 740).

Leadership in a structurally ambidextrous design is forceful. *Forceful leadership* is defined by Kaplan (2005, p. 13) as "leadership whereby the leaders assert themselves by means of their own intellect, vision, skills, and drive and to push others hard to perform; forceful leaders take charge, make their presence felt, tell people exactly what is expected of them, let nothing deter them from achieving objectives, and step up to the tough decisions." We consider forceful leadership as a driver to overcome the differentiation challenges and to manifest integration.

An alternative to structural ambidexterity is contextual ambidexterity (Gibson & Birkinshaw, 2004). *Contextual ambidexterity* is defined as "an organizational form that builds a context that encourages individuals to make their own judgements as to how best [to] divide their time between the conflicting demands for exploitation and exploration" (Gibson & Birkinshaw, 2004, p. 211). Thus, in a contextually ambidextrous design, it is the more dynamic and flexible supportive context that ensures that the entire organization is integrated (Gibson & Birkinshaw,

2004). It is, in addition, a leadership task to create this supportive context (Raisch & Birkinshaw, 2008). Furthermore, individuals have the power to make their own judgments about how to divide their time between exploitation and exploration (Gibson & Birkinshaw, 2004). When following the inherent logic of contextual ambidexterity, three conditions are important: individual autonomy, supportive context, and enabling leadership.

*Autonomy* is defined as "the extent to which employees have a major say in scheduling their work, selecting the equipment they will use, and deciding on procedures to be followed" (Sims, Szilagyi, & Keller, 1976, p. 197). Aagaard (2011) argues that to become ambidextrous, public organizations have to enable their employees with strong decision-making authority and autonomy. Individuals have to be stimulated to make their own judgments about how to best divide their time between exploitation and exploration, they have to be surrounded by a *supportive context* (e.g., Gibson & Birkinshaw, 2004; Yitzhack Halevi et al., 2015). We consider supportive context as an organization context that is created by the interaction between performance management and social support (Gibson & Birkinshaw, 2004). This type of context is characterized by a balance of discipline, stretch, support, and trust, all of which have to be present in order to stimulate ambidexterity. This means that the context induces members to "voluntarily strive for ambitious objectives; to meet all expectations generated by their explicit or implicit commitments; to lend assistance and countenance to others; and to rely on commitments of each other" (Gibson & Birkinshaw, 2004, p. 213). This context also facilitates "a shared ambition, a collective identity, the ability to give personal meaning; clear standards of performance and behavior, a system of open and consistent feedback; access to the available resources, freedom of initiative, limited top-down control; and, participation of every individual in the decision processes," and thus stimulates an integrated organization (Gibson & Birkinshaw, 2004, p. 213).

Contextual ambidexterity researchers (e.g., Birkinshaw, 2005; Gibson & Birkinshaw, 2004) problematize the top-down leadership approach of structural ambidexterity. In order to provide individuals space and support to decide when and how much time to divide to exploitation and exploration, leadership has to be enabling. The review article by Uhl-Bien and Arena (2018) shows that enabling leadership is a critical form for adaptive organizations. Enabling leadership is leadership that creates, engages, and protects adaptive space (Uhl-Bien & Arena, 2018). Kaplan (2005, p. 13) defines *enabling leadership* as "leadership whereby leaders tap into, bring out, and show appreciation for capabilities, both obvious and hidden, of other

**Table 1.** Summary of the Model.

| Conditions | Structural ambidexterity | Contextual ambidexterity |
|---|---|---|
| Design | | |
|   Differentiation | ✓ | ✗ |
|   Centralization | ✓ | ✗ |
|   Autonomy | ✗ | ✓ |
|   Supportive context | ✗ | ✓ |
| Leadership | | |
|   Forceful | ✓ | ✗ |
|   Enabling | ✗ | ✓ |

people; enabling leaders involve their people and open themselves to their influence in setting the strategic direction and in making decisions that affect the unit as a whole." A summary of this argumentation can be found in Table 1. Furthermore, we hypothesize:

> H1: The presence of the design conditions of differentiation, centralization and the leadership condition, and forceful leadership are sufficient to ensure ambidexterity in public organizations.
>
> H2: The presence of the design conditions of individual autonomy, supportive context and the leadership condition, and enabling leadership are sufficient to realize ambidexterity in public organizations.

While some argue that these classic perspectives (Table 1) are archetypes, others argue that decentralized structures are required for exploration whereas centralized structures are required for exploitation (Cannaerts et al., 2016; Uhl-Bien & Arena, 2018). Hence, we empirically test whether this classic configuration of design and leadership conditions is sufficient for ambidexterity in public organizations. Furthermore, we explore if both conditions can be combined.

## Research design

### Data—cultural and community centers

The data for this research article come from a survey launched across all cultural and community centers in Flanders, Belgium. The main goal of cultural and community centers is to serve as open and pluralistic houses that provide culture (VVC, 2014). The Flemish governmental decree on culture specified that "in general every cultural and community center has to promote a cultural offer and stimulate active cultural participation so that the needs of diverse target groups—potential customers, other socio-cultural associations, amateur groups, . . . are met and, so that cocreation and the offer of accommodation for diverse art and cultural initiatives for the local and regional community is provided" (VVC, 2014, p. 5).

**Table 2.** Infrastructural Characteristics of the Diverse Cultural and Community Centers.

| Characteristics | Type A | Type B | Type C | Community center |
|---|---|---|---|---|
| Theater | A hall including at least 400 seats and a fly tower | A hall including at least 350 seats or a multipurpose hall with 350 seats of which at least 200 seats are on an extendable stand | A hall including at least 300 seats or a multipurpose hall with 300 seats of which at least 150 seats are on an extendable stand or on fixed ascending rows of seats | A hall including at least 250 fixed seats |
| Multipurpose hall | A hall of at least 250 square meters | A hall of at least 200 square meters | A hall of at least 150 square meters | A hall of at least 100 square meters or 200 square meters if there is no theater |
| Exposition hall | One or more exposition rooms with a total surface of at least 300 square meters | One or more exposition rooms with a total surface of at least 200 square meters | One or more exposition rooms with a total surface of at least 150 square meters | A total surface of at least 100 square meters |
| Rooms for other usage | 6 rooms for cultural usage | 5 rooms for cultural usage | 4 rooms for cultural usage | 3 rooms for cultural usage |

Source: Adapted from (VVC 2014, pp. 3, 5–6).

The Flemish government has taken the initiative to build cultural and community centers and subsidize them for the maintenance of buildings, including personnel costs and their cultural programs, and they have partial decision-making power in their governance (e.g., Gosseye, 2012). These cultural and community centers are a Flemish policy priority, and are considered to be part of the policy domain of Youth, Sports, Culture, and Media (Jeffcutt, Pick, & Protherough, 2000; VVC, 2014). The governmental decree specified three different types of cultural centers A, B, and C, and one type of community center (Table 2).

The three cultural and the community centers differ in infrastructure and broadness of audience criteria (Table 2). Type A centers are the largest ones in terms of infrastructure and thus in organizational size—surface and number of employees, and the most diverse of audience and target groups, because they are located in central cities in regional urban areas. Type B centers are located in central cities and in small town areas; type C centers are located in central cities and in small town areas at the provincial level. Community centers are the smallest, with a specific focus on providing art for small local communities (VVC, 2014). Every center consists of professional part-time or fulltime employees, who develop the arts program, put into practice together with volunteers and diverse local art and nonart associations(VVC, 2014). More precisely, there are 13 A centers, 21 B centers, 30 C centers, and 87 community centers in Flanders.

The number of respondents that fully completed the survey was 72; our total response rate is 47.68% (72/151). Our dataset contains 84.61% of the A centers (11 out of 13), 66.66% of the B centers (14 out of 21), 50% of the C centers (15 out of 30), and 36.78% of the community centers (32 out of 87). Respondents were all people who have higher education, with 62.5% of all respondents being male; 81.9% were managing directors, while another 6.9% were members of the management team, and the remaining 11.1% had another function within the cultural or community center.

## Set-theoretic method—fuzzy set qualitative comparative analysis (fsQCA)

In this article, we use qualitative comparative analysis (QCA) to unravel how public organizations realize ambidexterity. QCA, as the set-theoretic method explains conditions and outcomes as "sets," suggests that cases have a membership in each set (e.g., the set "autonomy") (Fiss, 2011; Fiss, Cambré, & Marx, 2013; Ragin, 2008; Schneider & Wagemann, 2012). FsQCA allows cases to be more or less part of a set—to display features to different degrees (e.g., high autonomy or low autonomy). When using this method, some common rules of thought apply. First, QCA assumes that "the effect of a single condition unfolds only in combinations with other conditions" (Schneider & Wagemann, 2012, p. 78). This idea, which is called *conjunctural causation,* is in line with the literature on ambidexterity. For example, literature on structural ambidexterity suggests that the balance between exploitation and exploration is not caused merely by creating differentiated units, but that it also requires centralization and integration through forceful leadership to achieve ambidexterity. A second principle is the idea of *equifinality:* "a system can reach the same final state from different initial conditions and by a variety of different paths" (Katz & Kahn, 1978, p. 30). Just as there are multiple ways to Rome, there can be multiple, mutually nonexclusive explanations on how ambidexterity may be achieved (i.e., structural and contextual ambidexterity). Third, causal asymmetry, by which the set of conditions leading toward the outcome can be different from those leading to the non-outcome, is inherent to the analysis (Fiss, 2011; Ragin, 2008). The relationship between a condition, or a combination of conditions, and the outcome is explained in terms of necessity and sufficiency (Ragin, 2008). A condition is necessary if the outcome could not be achieved without it $(X \leftarrow Y)$. For example, "Organizations need differentiation to realize ambidexterity." A sufficient condition is one that typically results in the presence of durability $(X \rightarrow Y)$. For example, "All organizations that have high levels of differentiation are ambidextrous." The presence of a sufficient condition always results in the outcome. However, the outcome may occur without the condition being present (e.g., Schneider & Wagemann, 2012).

### Measuring and calibrating the conditions and outcome

Measurement of the conditions and the outcome was based on validated Likert scales adopted from previous research so that the construct or measurement validity reproduces the extent to which a measure of a concept reflects the concept that it is supposed to measure (Bryman, 2015) is maximized. The raw dataset was than inserted into R software. Before starting analysis, the membership of each case in every set (both conditions and outcome) was determined (e.g., Ragin, 2008; Schneider & Wagemann, 2012). This process is called calibration. Based on in-depth case knowledge and theoretical reasoning, researchers assign a specific membership score to the case for each condition and the outcome. Scores range between 0 (completely out of the set) and 1 (completely in the set). Using a direct method of calibration the precise criteria for full set membership (1), full set non-membership (0), and the cross-over point of maximum ambiguity (0.5) were determined (Ragin, 2008; Schneider & Wagemann, 2012).

We measured the outcome ambidexterity by two 5-point Likert scales—exploitation and exploration—with a range from (1) strongly disagree to (5) strongly agree. The exploitation scale contains six items, such as "improving quality" whereas the exploration scale contains five items such as "looking for novel ideas by thinking outside the box" (Fernhaber & Patel, 2012). Both scales were considered reliable (Exploitation: $M = 16.44$; $SD = 2.78$; $\alpha = 0.56$; Exploration: $M = 16.78$; $SD = 3.73$; $\alpha = 0.83$). In determining the thresholds for the calibration procedure, we followed He and Wong (2004), who argue that an organization is regarded as ambidextrous if it has relatively equal emphasis on exploration and exploitation activities. Therefore, the crossover point of 0.5 was put at the raw value of 3.01 for both exploitation as well as exploration. Next, we took the minimum value of both exploitation and exploration as the organizations' value for ambidexterity [$Outcome(Ambidexterity) = Exploitation * Exploration$]. A first observation is that there are cases in our dataset that can be considered as having a moderate value for both exploitation and exploration, but few cases have high values for both exploitation and exploration.

Differentiation was measured using a 7-point Likert scale from (1) strongly disagree to (7) strongly agree, with four items such as "Innovation and production activities are structurally separated within our cultural center" (Jansen et al., 2009). The measure was considered reliable ($M = 11.61$; $SD = 4.51$; $\alpha = 0.67$) (e.g., Gliem & Gliem, 2003). The scale for centralization, using the same 7-point Likert scale, which was adopted from Jansen, Van Den Bosch, and Volberda (2006), contained three items, and was considered reliable ($M = 9.56$; $SD = 4.13$; $\alpha = 0.78$). An item example is "There can be little action taken here until a supervisor approves a decision" or "Even small matters have to be referred to someone higher up for a final

decision." In the calibration procedure for differentiation and centralization, the cross-over point was put at a mean score of 4.01. This follows the reasoning of the theoretical framework, indicating that the organization is at least to some degree differentiated and centralized.

Autonomy was measured by including three items of the job characteristics scale of Sims et al. (1976). Respondents had to give answers on a scale from (1) very little to (5) very much, which was considered reliable ($M = 10.47$; $SD = 1.94$; $\alpha = 0.748$). An example is "Every employee has control over the pace of his/her work" or "Every employee has the opportunity for independent thought and action." For autonomy, the cross-over point was set at the raw value of 3.51. This means that every case that has a raw mean score higher than 3.51 is considered as being in the set of having autonomy. The theoretical logic behind this calibration is that individuals have to indicate that they have moderate to high scores of autonomy. Supportive context is measured by using the 16-item 7-point Likert scale, with a range from (1) strongly disagree to (7) strongly agree of Gibson and Birkinshaw (2004). This scale includes two different constructs, performance management and social context, represented by items such as "To set challenging/aggressive goals," and "Devote considerable effort to developing their subordinates." Both scales were considered as reliable (Performance management: $M = 33.39$; $SD = 4.70$; $\alpha = 0.66$; Social context: $M = 44.53$; $SD = 6.24$; $\alpha = 0.79$). Because both performance management and social context should be considered holistically and as nonsubstitutable, an interaction term between both was formed to construct "supportive context" (Gibson & Birkinshaw, 2004). The cross-over point for supportive context was set at the raw value of 24.01. The reasoning behind this calibration point is that respondents have to indicate that moderate to high levels of performance management and social support characterizes their context. Since supportive context is an interaction term of both performance management and social support, the calibration point is an interaction term of their mean scores (the interaction term between 4.9 and 4.9). Thus, every case with a sum score of 24.01 or higher on context received a calibrated score between 0.5 and 1.

Forceful leadership was measured by using the reliable ($M = 62.75$; $SD = 9.44$; $\alpha = 0.90$) 12-item scale of Kaplan and Kaiser (2003). To capture overdoing or imbalance, the reliable and validated scale has a range from (0) much too little to (5) the right amount to (9) much too much. An example of an item is "Takes charge—in control of his/her area of responsibility" or "Pushes people hard." Enabling leadership was measured using the same scale of Kaplan and Kaiser (2003). Once more, this scale was considered reliable ($M = 64.50$; $SD = 9.01$; $\alpha = 0.90$). An item example is "Empowers people—able to let go" or "Sensitive—careful not to hurt the

other person's feelings." Both forceful and enabling leadership were calibrated with a cross-over point at the raw value of 5.01, indicating that all those who have the high levels of forceful or enabling leadership receive a score between 0.5 and 1.

### Proceeding to the analysis

Once the calibration was completed, we performed the analysis of necessity, in which we checked whether there are any necessary conditions for the outcome. Next, we turned to the analysis of sufficiency, in which first a truth table is constructed. The truth table consists of all logically possible configurations (combinations of conditions), which are represented by truth table rows (Schneider & Wagemann, 2012). Each case is assigned to a row based on their membership scores. If the truth table rows display a consistent pattern, meaning that all cases assigned to that row display both the configuration and are "in" the set of ambidextrous organizations, they are included in the logical minimization process. This means that "if two configurations differ in only one condition, but show the same outcome, this particular condition can be eliminated" (Schneider & Wagemann, 2012, p. 105 in Van Meerkerk, Kleinhans, & Molenveld, 2018, p. 658). The analysis was performed using the SetMethod and QCA packages in R (Duşa, 2018; Medzihorsky, Oana, Quaranta, & Schneider, 2016). We also performed analyses for the non-outcome, robustness checks, and a cluster analysis, which can be found in Supplementary Appendices A, B, and C

### Findings

First, the analysis of necessity was performed (Table 3). Following Ragin (2008), the minimal consistency benchmark for necessity is set at 0.9. Consistency can be regarded as a performance indicator in QCA analysis, and explains the degree to which a statement of necessity or sufficiency is in line with the empirical evidence (see Schneider & Wagemann, 2012; Vis,

**Table 3.** Analysis of Necessity for the Outcome.

| Condition | Consistency | Coverage | RoN |
|---|---|---|---|
| Differentiation (D) | 0.544 | 0.924 | 0.969 |
| Centralization (CE) | 0.507 | 0.741 | 0.880 |
| Forceful leadership (F) | 0.850 | 0.801 | 0.814 |
| Autonomy (A) | 0.840 | 0.788 | 0.802 |
| Context (CO) | 0.859 | 0.878 | 0.894 |
| Enabling leadership (E) | 0.894 | 0.801 | 0.796 |
| Absence of differentiation (∼D) | 0.896 | 0.643 | 0.542 |
| Absence of centralization (∼CE) | 0.913 | 0.703 | 0.639* |
| Absence of forceful leadership (∼F) | 0.780 | 0.845 | 0.881 |
| Absence of autonomy (∼A) | 0.722 | 0.787 | 0.845 |
| Absence of context (∼CO) | 0.765 | 0.760 | 0.802 |
| Absence of enabling leadership (∼E) | 0.739 | 0.852 | 0.896 |

**Table 4.** Truth Table for the Outcome (enhanced standard analysis).

|     | D | CE | F | A | CO | E | OUT | Incl. | PRI | Cases |
|-----|---|----|---|---|----|---|-----|-------|-----|-------|
| 33 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0.977 | 0.718 | 5 |
| 48 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0.971 | 0.777 | 28, 40, 55 |
| 40 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0.970 | 0.742 | 34 |
| 44 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0.969 | 0.683 | 54 |
| 37 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.967 | 0.664 | 52, 58 |
| 46 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0.965 | 0.662 | 24 |
| 4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0.960 | 0.653 | 45 |
| 11 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0.959 | 0.655 | 23, 26, 38 |
| 15 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0.958 | 0.655 | 1 |
| 8 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0.958 | 0.707 | 2, 37, 39 |
| 7 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0.957 | 0.670 | 11, 18, 57, 68 |
| 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.956 | 0.593 | 49, 50 |
| 12 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0.951 | 0.682 | 15, 20, 30, 35, 41, 46, 67 |
| 62 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.948 | 0.267 | 63 |
| 24 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0.940 | 0.416 | 60 |
| 16 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0.939 | 0.627 | 7, 25, 33, 51, 56, 65 |
| 32 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0.939 | 0.423 | 19 |
| 10 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0.936 | 0.522 | 42 |
| 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0.934 | 0.493 | 22, 29, 53, 70 |
| 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0.934 | 0.475 | 4, 9, 27, 64, 66 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.920 | 0.403 | 32, 47, 62 |
| 14 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.915 | 0.468 | 17, 21, 31, 43, 59, 69 |
| 6 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0.913 | 0.432 | 3, 13, 48, 61 |
| 29 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0.911 | 0.273 | 14 |
| 30 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0.909 | 0.275 | 36, 44 |
| 21 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0.905 | 0.253 | 6 |
| 17 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0.894 | 0.207 | 10 |
| 26 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0.888 | 0.208 | 8 |
| 25 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.855 | 0.153 | 12, 16, 71, 72 |

*Notes:* All other rows are logical remainders (i.e., those rows for which there is no empirical evidence that the combination of conditions of that particular row leads to the outcome [Fiss, 2011; Schneider & Wagemann, 2012]).

2012, p. 187). Following Thomann, van Engen, and Tummers (2018), the minimal Relevance of Necessity (RoN) threshold for necessity is set at 0.6. RoN is the criterion that indicates the strength of the necessary condition (e.g., Schneider & Wagemann, 2012). The analysis of necessity shows that the absence of centralization ($\sim$CE) can be considered a necessary condition. Hence, when there is absence of a high hierarchy of authority and when there is high participation in decision making, organizations are ambidextrous. This indicates that organizations need integration at all organization levels to realize ambidexterity.

We continue with the analysis of sufficiency. Table 4 represents the truth table for the presence of the outcome. Here, we selected a consistency threshold of 0.8. As the table shows, all truth table rows with cases assigned to them score above the consistency threshold of 0.8. However, note that the Proportional Reduction in Inconsistency (PRI) score of several of these truth table rows are very low. The PRI indicates how much a given condition or truth table row is a subset of the outcome rather than a subset of either the outcome or the non-outcome. Therefore, a low PRI score indicates that this truth table row might also be a subset of the non-outcome ambidexterity and thus might be used later in the analysis to explain the

**Table 5.** Conservative Solution Formula for the Outcome.

|  | Path 1 | Path 2 | Path 3 | Path 4 | Path 5 | Path 6 |
|---|---|---|---|---|---|---|
| Differentiation (D) | ✗ |  | ✗ | ✗ | ✓ | ✓ |
| Centralization (CE) | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Autonomy (A) |  |  | ✓ | ✗ |  | ✓ |
| Supportive context (CO) | ✓ | ✓ | ✓ | ✓ | ✗ |  |
| Forceful leadership (F) |  | ✓ | ✗ | ✓ | ✗ | ✓ |
| Enabling leadership (E) | ✓ | ✓ |  |  | ✗ | ✓ |

absence of ambidexterity. Following Cooper and Glaesser (2011, 2016), we exclude all truth table rows with a PRI score <0.6 before the minimization process. This leaves us with 13 configurations for the analysis. However, further study of the truth table shows that a number of truth table rows include deviant cases consistency in kind. These cases have a set membership score in the configuration (combination of conditions) presented in the truth table row of above 0.5 (in the set), but a set membership score in the outcome of below 0.5 (out the set). This is the case for truth table rows 40 (case 34), 15 (case 1), 8 (cases 2, 37, and 39), 7 (cases 11, 18, 57, and 68), 12 (cases 15, 20, 30, 35, 41, 46, and 67) and, row 16 (cases 7, 25, 33, 51, 56, and 65). In deciding which rows to include in the remaining part of the analysis, we use a "majority rule." Truth table rows that consist of more typical cases than deviant cases are included in the analysis, whereas truth table rows with mainly deviant cases are excluded from the minimization process (e.g., Warsen, Klijn, & Koppenjan, 2019). Based on this argument, we exclude rows 40 and 15 from further analysis: the empirical cases assigned to this configuration are not a member of the outcome.

The remaining 11 truth table rows are included in the process of minimization. In Table 5, we present the conservative solution formula. This solution formula only includes truth table rows for which there is empirical evidence. Hence, logical remainders are not included in the minimization process. The most parsimonious solution formula, which does include these logical remainders, is presented in Supplementary Appendices D. The most conservative solution formula shows that there are six different configurations, or paths, that are sufficient for ambidexterity in public organizations. Before interpreting these results, we check the reliability of our findings (e.g., Bryman, 2015) by considering the parameters of fit of the solution formula: consistency and coverage (Table 6). *Consistency* refers to "the degree to which cases correspond to the set-theoretic relationships expressed in a solution" (Fiss, 2011, p. 403). *Coverage* measures the strength of a relationship (Schneider & Wagemann, 2012); it explains how well the available empirical data are explained by the conditions or configurations, or how many of the cases are covered by a single solution term or the solution formula (Schneider & Wagemann, 2012). More precisely, there

**Table 6.** Parameters of Fit for Solution Formula for the Outcome.

|  | Consistency | Raw coverage | Unique coverage | Solution consistency | Solution coverage |
|---|---|---|---|---|---|
| Configurations: |  |  |  |  |  |
| Path 1: ~D*~CE*CO*E | 0.925 | 0.731 | 0.006 | 0.920 | 0.789 |
| Path 2: ~CE*F*CO*E | 0.925 | 0.729 | 0.003 |  |  |
| Path 3: ~D*~CE*~F*A*CO | 0.956 | 0.623 | 0.004 |  |  |
| Path 4: ~D*~CE*F*~A*CO | 0.950 | 0.625 | 0.008 |  |  |
| Path 5: D*~CE*~F*~CO*~E | 0.968 | 0.418 | 0.008 |  |  |
| Path 6: D*~CE*F*A*E | 0.967 | 0.462 | 0.003 |  |  |

are three specific types of coverage: unique, raw, and solution coverage. Unique coverage scores reveal that each single path in the solution formula has some unique contributions to covering the outcome. If these scores are low, that means that this unique path does not contribute much to the presence of the outcome. Raw coverage is the indication of which share of the outcome is explained by a certain alternative path; and solution coverage is the percentage of all cases set membership in the outcome, covered by the entire solution formula, thus indicating how much is covered by the solution formula (Schneider & Wagemann, 2012).

A first path sufficient for ambidexterity is formed by the absence of centralization and differentiation in combination with the presence of a supportive context and enabling leadership. This path represents a more contextual approach that leads to ambidexterity. A typical and uniquely covered case by this path is case 2. This case is a cultural center type A thus the largest type that is included in the dataset.

A second path is formed by the absence of centralization with the presence of a supportive context, enabling as well as forceful leadership. This path represents a more contextual approach in combination with versatile leadership—leadership that is both enabling and forceful (Kaplan, 2005; Kaplan & Kaiser, 2003). Versatile leadership is thus a balance approach toward enabling and forceful leadership, which is sufficient for ambidexterity. An explanation can be found in the assumption that overdoing in one element while overlooking the other although both are sufficient to be effective is present in both leadership and ambidexterity literature (e.g., Kaplan & Kaiser, 2003; March, 1991). A unique case for this path is case 54, which is also a cultural center type A. A uniquely covered case is case 46, a cultural center type B.

A third path is one characterized by the absence of centralization, differentiation, and autonomy in combination with the presence of a supportive context and forceful leadership. This is an organization that is characterized by top-down, directive leadership that focuses on the creation of performance management and social support, the basic characteristics of a supportive context (e.g., Gibson & Birkinshaw, 2004). What is more is that the

emphasis is more on performance management than on social support. Hence, this path is characterized by leaders within organizations who take charge and urge others to perform, albeit in a context characterized by a strong emphasis on commitments, clear standards for performance, and ambitious objectives (Gibson & Birkinshaw, 2004). A most typical and uniquely covered case by this path is case 30, a cultural center type B.

A fourth path is formed by the absence of centralization, differentiation, and forceful leadership in combination with the presence of autonomy and a supportive context. The emphasis here is on giving individuals the autonomy to make their own decisions given timing, equipment, procedures to follow, and by providing a supportive context wherein individuals are so supported. A uniquely covered and typical case representing this fourth path is case 23, a cultural center type A.

A fifth path is the combination of the absence of centralization with the presence of autonomy, differentiation, enabling and forceful leadership. This path represents organizations that differentiate exploitation and exploration in different units, which is a typical structural ambidextrous element. However, the difference with structural ambidexterity is that centralization is absent and that leadership is versatile. This refers to differentiated units that each have the autonomy to make their own decisions within the boundaries of their unit combined with versatile leadership that integrates these units on a higher organization level. A typical case is case 58, a cultural center type B.

The final path is that of the absence of centralization, context, enabling and forceful leadership combined with the presence of differentiation, which is covered by organizations that differentiate exploitation and exploration in separate units without forceful or enabling leadership. This can refer to rather self-managing exploitation and exploration units. A most typical and uniquely covered case is case 55, a community center. An explanation for this path is that this type of cultural center is so small that integration comes naturally.

To explore further differences between the types of cultural and community centers and the paths they use to become ambidextrous, we performed a cluster analysis (Supplementary Appendices C). Our cluster analysis reveals that in general the results hold for all types of cultural centers in our dataset. There are only some minor differences. For example, for the path $\sim D^*\sim CE^*CO^*E$ and for the path $\sim CE^*F^*CO^*E$, the consistency is slightly higher for the largest cultural centers (Type A) compared to the community centers. This indicates that for larger cultural centers, this path is more in line with the empirical evidence. Hence, larger cultural centers use a more contextual approach to ambidexterity compared to smaller cultural and community centers. Furthermore, the coverage of $\sim D^*\sim CE^*\sim F^*A^*CO$ is somewhat lower for cultural centers type B,

while cultural centers type A are slightly less covered in the path $\sim D^*\sim CE^*F^*\sim A^*CO$. Hence, cultural centers type C and community centers are better covered in these paths. In general, these results, irrespective of these minor differences, follow the theoretical insights from private sector ambidexterity research; namely, smaller organizations rely more on contextual ambidexterity to become ambidextrous (e.g., Parida, Lahti, & Wincent, 2016).

## Conclusion and discussion

*Which combination of leadership and design conditions plays a role for ambidexterity in public organizations?* We can conclude from our QCA that all our hypotheses have to be rejected. One condition is argued necessary for ambidexterity—the absence of centralization. Furthermore, six different paths or combinations of conditions were found to be sufficient for ambidexterity. Our analysis reveals that public organizations combine design and leadership conditions of both structural and contextual ambidexterity to balance simultaneously exploitation and exploration. Furthermore, our cluster analysis reveals no remarkable differences between the different types of cultural and community centers in their paths for ambidexterity.

### Theoretical contributions

By implementing a configurational perspective to the ambidextrous design typology, our findings contribute three main elements to ambidexterity theory. First, we answer the call from ambidexterity and public sector researchers (e.g., Cannaerts et al., 2016; Choi & Chandler, 2015; Deserti & Rizzo, 2014; Smith & Umans, 2015), and demonstrated how public organizations can implement and foster innovations while simultaneously focusing on efficiency. Our findings thus follow the work of Güttel, Konlechner, and Trede (2015), who state that structural ambidexterity as well as contextual ambidexterity constitute archetypical organizational forms. Our findings empirically accept that conditions of both structural and contextual ambidexterity are combined within one configurational path for ambidexterity in public organizations.

Second, our findings follow other researchers (e.g., Cannaerts et al., 2016), by indicating that although the context and goals of public organizations are more or less the same, that those can follow multiple pathways to become ambidextrous. Hence, there is not "one solution," not "one way" to ambidexterity. Our findings do not support the assumption (e.g., Agostini et al., 2016; Deserti & Rizzo, 2014) that one configuration outperforms the other.

Third, our findings do not show that leadership is a necessary condition for organizations seeking to become ambidextrous. Our findings do not follow the argument that becoming ambidextrous is primarily a leadership challenge (e.g., Probst, Raisch, & Tushman, 2011). We did find, however, that leadership is a sufficient antecedent for ambidexterity, which supports the importance of leadership for organizations (e.g., Rainey & Steinbauer, 1999; Raisch & Birkinshaw, 2008; Smith & Umans, 2015).

### Methodological contributions

By using QCA, we contribute to the call (e.g., Agostini et al., 2016; Birkinshaw & Gupta, 2013) for further elaboration of the interplay between design and leadership conditions, by offering clarity about which combination of design and leadership conditions outperforms the other. By implementing QCA, we followed authors such as Agostini et al. (2016), who claim that alternative measurement models are relevant to test in order to enhance understanding of mixed structural and contextual design. In addition, QCA has the advantage of not seeking "one best solution"; thus, given multiple solutions for ambidexterity are tolerable (e.g., Katz & Kahn, 1978). The use of QCA to measure ambidexterity is an alternative measurement approach that provides a more comprehensive measurement of ambidexterity.

### Limitations and future research paths

Although this research article contributes to current ambidexterity and public sector research, it also has some limitations, which can be summarized. First, external validity, the generalization of our findings to the larger public sector (e.g., Bryman, 2015) is limited. There are three main reasons for this. First, although our sample of cultural and community centers is representative for the total population, there was a little overrepresentation of A centers as well as under-representation of community centers within our dataset. Hence, there is some nonresponse bias given the underrepresentation of the community centers (Armstrong & Overton, 1977). A possible explanation for the underrepresentation of community centers could be that micro-organizations do not score positively on the "interest hypothesis" (e.g., Armstrong & Overton, 1977), since they do not have a clear goal of becoming more innovative and efficient.

Secondly, although public sector research considers public organizations to be homogenous (e.g., Smith & Umans, 2015), they are very diverse public organizations. We only included a specific type of public organization, cultural and community centers, in our analysis, and only collected data

from one respondent per organization. Future research must elaborate this QCA approach toward the broader public sector and include organizations of diverse sizes to gain more insight into the practical implementation of ambidextrous design and leadership.

Thirdly, although our focus is on ambidexterity in public organizations, we used measures from the ambidexterity literature on private sector firms. To address this limitation, we adjusted the measures to the specific context of cultural and community centers. For example, to enhance the reliability of the exploitation scale we deleted one item from our analysis and split another in two. However, this only led to a reliability of 0.56. An explanation for this low Cronbach's α can be found in the nature of the items, which is diverse, and it can even be argued that it is too diverse to be counted as one scale. Although a higher Cronbach's α is better, we decided to continue our analysis including exploitation since it is not considered as completely unreliable (e.g., Gliem & Gliem, 2003). Future research has to focus, however, on a more in-depth study of the exact meaning of exploitation and exploration in public organizations. What does it mean within those organizations to be exploitative and explorative? In addition, we argue that the same need is there for the diverse design elements of structural and contextual ambidexterity: how does differentiation unfold within public organizations? How is a supportive context created? Hence, a more in-depth qualitative approach is necessary to gain more insight into the exact meaning and adaptation of the measures.

Furthermore, limited cases can be classified as having high levels of exploitation and exploration. This results in the phenomenon that "outstanding" cases are rather unique and that we have a rather skewed dataset for the outcome ambidexterity. What is more is that there is also a skewed set for the condition of differentiation and a partially skewed set for the condition of centralization. This means that almost all cases are a member of the set "low differentiation and low centralization." Given this, two recommendations can be given. Firstly, researchers have to explore further the question if public organizations can even become ambidextrous (e.g., Palm & Lilja, 2017). Secondly, if we follow our own data and those that argue that public organizations can become ambidextrous (e.g., Bryson et al., 2008), researchers have to extend the amount of ambidextrous organizations within their dataset as well as the in-depth understanding of combined conditions. Therefore, qualitative in-depth case studies as well as more quantitative research are useful. In addition, research (e.g., Burton et al., 2015) has indicated that a proper organization design that is adaptive and aligned will gain higher performance. We recommend future research to evaluate the relationships between ambidextrous design and performance.

Finally, this article had a limited focus on classic ambidextrous designs and balancing exploitation and exploration. This can only result in an integrative ambidexterity theory if more and multiple causal relationships are taken into account so that strategy, design, and environment are linked (Fiss, 2011).

## Notes on contributors

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