Matching leadership to circumstances? A vignette study of leadership behaviour adaptation in an ambiguous context

Marieke van der Hoek, Maarja Beerkens and Sandra Groeneveld

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Marieke van der Hoek

Maarja Beerkens

Sandra Groeneveld

Institute of Public Administration, Leiden University

E: m.a.van.der.hoek@fgga.leidenuniv.nl

Abstract

Leadership does not take place in a vacuum, but is embedded within a context. To address the various demands in their environment, leaders have to adapt their behaviour to fit with the situation. Working with competing values, multiple goals, different tasks, and a range of stakeholders generates contextual ambiguity, which is particularly prevalent in many public organisations. Nonetheless, whether and how leaders adapt their leadership behaviour to context remains elusive. This paper examines to what extent and how leaders adapt their leadership behaviour to ambiguity in their task context. Drawing on the concept of requisite variety it is hypothesised that more ambiguous situations require more complex leadership behaviour. Furthermore, it is hypothesized that such adaptation may be constrained by the distribution of formal authority which may limit –or stimulate–behaviours at the expense of others. Data were collected in a 2x2x2 vignette interview design with leaders holding formal leadership positions in Dutch universities, organisations particularly prone to ambiguity. The within-person design enables analysing how variations in context elicit different choices by the same participant, controlled for between-person differences.

Key words: leadership behaviour, contextual ambiguity, behavioural adaptation, public management, vignette methodology

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Introduction

Leadership does not take place in a vacuum, but is embedded within a context. This is relevant, because characteristics of the context in which leaders behave pose challenges for leadership. This is particularly salient for many leaders in public organisations, because of the demands on public leaders to balance various competing values (Hood, 1991) and the complications of hierarchical structures of authority that contribute to a situation of distributed leadership (Groeneveld & Van de Walle, 2011; Shamir, 1999). Working with competing values, multiple goals, different tasks, and a range of stakeholders confronts leaders with a multitude of demands from their environment, that are not always easy to meet and puts them in thorny situations. As a consequence, leaders face contextual ambiguity, which is particularly prevalent in many public organisations (Boyne, 2000; Davis & Stazyk, 2015; Dixit, 2002). To navigate this ambiguity and address the various demands from their environment, leaders have to adapt their behaviour to fit with the situation (Denison, Hooijberg & Quinn, 1995).

Nonetheless, whether and how leaders adapt their leadership behaviour to context remains elusive. Explicitly accounting for this context in which public leadership takes shape has been largely absent in previous research, but is strongly pressed for both in public management and leadership literature (Bryman & Lilley, 2009; Day, 2014; O'Toole & Meier, 2015; Osborn, Uhl-Bien & Milosevic, 2014; Ospina, 2017; Porter & McLaughlin, 2006; Vandenabeele, Andersen & Leisink, 2014; Vogel & Masal, 2015; Wright, 2015; an exception is a theoretical paper by Shamir & Howell, 1999). Recently, some studies have begun to take up this challenge and provide some empirical evidence of the relevance of context for shaping leadership and managerial behaviour (George, Van de Walle & Hammerschmid, 2019; Nielsen & Cleal, 2011; Stoker, Garretsen & Soudis, 2018). Nevertheless, the bulk of prior research provides many insights in the consequences of leadership, Vogel and Masal (2015) show that studying leadership outcomes is a clear trend in public management. In contrast, the question of how leadership is shaped itself is in need of further study to be answered (Porter & McLaughlin, 2006).

This is a relevant question, because the significance of leadership is stressed when leaders face an environment that complicates the organisation performing towards its goals. We define leadership as "the process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives." (Yukl, 2008, p. 8). Fitting with our central ideas about a dynamic context impacting leadership behaviour, this definition helps to illuminate the continuous and relational character of leadership involving a wide range of behaviours. In light of competing demands on limited resources, the effectiveness of leadership depends on the whole repertoire of leadership behaviours (Denison, et al., 1995; Havermans, Den Hartog, Keegan & Uhl-Bien,

2015). Leadership creates the conditions under which organisational goals can be pursued (Greenleaf, 1977; Sendjaya & Sarros, 2002; Yukl, 2008). Contextual ambiguity troubles this goal pursuit, which makes leadership more indispensable.

To address this issue, we conducted empirical research focusing on the question: *What is the effect of contextual ambiguity on leadership behaviour?* Based on a within-person vignette interview study with leaders in Dutch universities (n $_{participants}$ = 23, n $_{observations}$ = 184), this paper adds to the literature on leadership by testing hypotheses on the relationship between context and leadership behaviour. Drawing on the concept of requisite variety (Ashby, 1952) it is hypothesised that more ambiguous situations require more complex leadership behaviour (see also Denison et al., 1995). Such adaptation may be constrained, however, by structural factors, which may limit –or stimulate–behaviours at the expense of others (O'Toole & Meier, 2015; Pedersen, Favero, Nielsen & Meier, 2017; Perrow, 1970).

The paper continues with a theoretical framework that discusses the concepts and hypotheses that are tested in this study. The next section addresses the research design, followed by a presentation of preliminary analyses.

Theoretical framework

Leadership in context

In order to understand leadership, we have to consider it embedded within its context (Porter & McLaughlin, 2006). Public administration scholars address the saliency of context in numerous treatments of what makes the public sector special in ways that affect how organisations and people within them function (e.g. Pollitt, 2013; Rainey & Bozeman, 2000; Vandenabeele et al., 2014). However, how leadership behaviour takes shape in its organisational context in general (Porter & McLaughlin, 2006) and in the particular context of public organisations (Vandenabeele et al., 2014; Van Wart, 2013; Vogel & Masal, 2015) is not yet well understood. A review by Lord et al. (2017) discusses work in the contingency tradition, but concludes that due to inconsistent findings and an unclear potential effect on performance, attention has faded for research on the effects of context on leadership. Lately there has been more attention for the relevance of context for public management, for instance by addressing questions of how national culture, electoral and governmental tradition or social and economic developments affect various aspects of managing public organisations (e.g. Pollitt, 2013). The context in which leaders operate has been considered in research among political leaders and with regard to publicness (Ospina, 2017; Vogel & Masal, 2015) and recently a number of studies has started to explain leadership behaviour by organisational context variables (George et al., 2019; Nielsen & Cleal, 2011; Stoker, Garretsen & Soudis, 2018). Still, the question how organisational demands affect

leadership behaviour has received little attention yet (cf. Porter & McLaughlin, 2006) and the use of a contextualised approach is still limited and needs further development (Ospina, 2017; Vogel & Masal, 2015).

This issue is relevant for the study of leadership, because how leaders perceive their context and the leadership situations they find themselves in could influence how they behave (Shivers-Blackwell, 2004, 2006). When demands from their environment change, leaders may change their perspective on what their role as a leader is and what an appropriate action or response on their behalf would be. Johns' (2006) discussion on the role of context for organisational behaviour points out that social phenomena themselves and their relationships with other phenomena are influenced by opportunities or constraints surrounding them. Without contextualisation, parts of the picture remain out of sight and oversimplified conclusions seem unavoidable (Johns, 2006). In this study context denotes discrete context as defined by Johns: "specific situational variables that influence behaviour directly or moderate relationships between variables" (Johns, 2006, p. 393). In particular, task context of leaders is focused on, which involves factors such as uncertainty and autonomy that influence the leadership situations that leaders are confronted with.

These situations present a variety of demands for leaders and thereby create contextual ambiguity. Ambiguity refers to a state of being that is open to multiple interpretations (Feldman, 1989). It is a relevant characteristic when the context of leaders in public organisations is being examined (Johns, 2006). This is highlighted by its omnipresence, since public organisations engage in the creation of a variety of public values that are not always easily combined (Hood, 1991). Thereby they are working on multiple goals involving different tasks and are being confronted with a range of stakeholders with their own interests – which all takes place in complex structures and relationships that add to the creation of ambiguity (Dixit, 2002).

From the literature, we can derive two dimensions of contextual demands producing ambiguity to which leaders could adapt their behaviour. The first dimension concerns two different organisational needs or objectives that are of importance for the longer term viability of an organisation. On the one hand, stability and continuity are needed to provide certainty and confidence for organisational performance. This need is mainly linked to daily operations and has a shorter term character. On the other hand, organisations have to adapt and innovate to remain relevant and capable to deal with challenges in their environment. This need is more strategic and has a longer term orientation (Denison et al., 1995; Quinn & Rohrbaugh, 1983). This dimension is closely linked to the literature on ambidexterity, in which stability is discussed as the organisational objective of exploitation and flexibility as the organisational objective of

exploration. In order to ensure that the organisation can sustain itself the long run, both longer term and shorter term needs have to be satisfied. Since achieving such ambidexterity draws on the same resources for different needs simultaneously, tension and ambiguity are prevalent (e.g. March, 1991; O'Reilly & Tushman, 2013; Raisch & Birkinshaw, 2008; Turner, Swart & Maylor, 2013).

A second dimension deals with the distinction between different domains at which leadership is aimed, connected to different roles of leaders. On the one hand, referred to as "leadership in organisations" (Dubin, 1979; Hunt & Ropo, 1995), leaders have a role as supervisors at the level of individual employees. Demands on leaders stem from individuals within the organisation and to a large extent involves face-to-face interaction and operational and tactical leadership (Hunt & Ropo, 1995; ref). Much research on leadership in public organisations has looked into leadership in this dyadic relationship between leaders and subordinates (Ospina, 2017; Vandenabeele, Andersen & Knies, 2014; Van der Hoek, Beerkens & Groeneveld, 2019; Vogel & Masal, 2015). On the other hand, leaders have a role as responsible person in handling issues at the organizational (unit) level, which has been referred to as "leadership of organizations" (Dubin, 1979; Hunt & Ropo, 1995). Demands on leaders then originate with organisational interests that transcend individual employees and leadership is more strategic and concerns comparatively less individual supervision (Hunt & Ropo, 1995; Van der Hoek, Beerkens & Groeneveld, 2019). Middle managers are confronted with both types of demands – coming from below and above – that are not always aligned and therefore compete (ref), creating ambiguity for leadership.

Leaders cannot isolate these demands, but have to consider multiple tasks and objectives in coherence (Denison et al., 1995). Ambiguity arises because the various demands are all important, but how they have to be prioritised, balanced, and realised is not clear-cut. The extent to which these demands are aligned or competing affects the level of ambiguity in the leadership situation. Objectives that are more aligned would easier show how to cope with the demands in combination. Objectives that are less aligned involve priorities that are more competing and put more pressure on how to cope with each demand. Moreover, contextual ambiguity is reinforced because leaders are confronted with varying conditions, as different (combinations of) issues become salient in different situations. Since contextual ambiguity likely impacts how leaders interpret the leadership situations and the competing needs they have to cope with (Johns, 2006), how to proceed and manage these issues in combination is not always straightforward, how to balance or prioritise various demands can be interpreted in multiple ways.

Leadership adaptation in an ambiguous context

To address the various needs, leaders would have to adapt their approach to fit with the situation and draw on different options in behavioural repertoires. A leadership behaviour repertoire can be seen as a range of behavioural options, connected to different roles, from which a leader can choose the most appropriate based on what the environment requires of him/her (Denison et al., 1995). Based on the Competing Values Framework (CVF), Denison et al. (1995) distinguish eight roles of leaders: innovator, broker, producer, director, coordinator, monitor, facilitator and mentor. Each role is characterised by a number of leadership behaviours. Since each option has particular benefits and is suitable to be used in light of different needs surrounding a leader, s/he needs to be able to switch between different approaches and combine them.

Denison et al. (1995) study whether effective leadership is associated with the use of more types of leadership behaviour, but have not tested whether and how these vary between situations varying on contextual factors. This study makes this step to get a better understanding of how these roles and behaviours are combined by leaders and thus how behavioural complexity is enacted in practice and in particular in concrete situations.

The general idea that 'one size fits all' is inappropriate and that context or environment is very important for organisations is not new, as recognised by numerous authors in the best fit approach (Boxall & Purcell, 2008) and contingency theory approaches (e.g. Aldrich, 1979; Burns & Stalker, 1961; Donaldson, 2001; Fiedler, 1967; Lawrence & Lorsch, 1967; Mintzberg, 1970; Perrow, 1967). In contrast to our argument, these approaches try to discover optimal contingencies for particular behaviours as a sort of 'if-then'-recipes, whereas this project aims to find out how leaders adapt their approach based on their perception of specific leadership situations. This does not imply an optimal response, since leaders have to balance numerous demands simultaneously that are constantly changing. Given the complex and dynamic nature of the set of demands facing leaders, the question shifts from finding a best solution to understanding how leaders respond to and balance in light of those demands. Consequently, there is not one effective recipe for leadership that will work at all times, but leaders need a leadership behaviour repertoire from which they can use different options that are suitable for particular situations (Carmeli & Halevi, 2009; Denison et al., 1995; Havermans et al., 2015).

This requires sensitivity to the situation and the stakes involved on the side of leaders and adaptation of leadership behaviour to the specific conditions (cf. situational leadership, which mainly concerns adaptation of leadership to employee characteristics rather than to organisational context factors [Graef, 1997; Thompson & Vecchio, 2009; Yukl, 2008]). Instead of adopting a single leadership style, leaders should be able to balance different types of behaviour

appropriate for the situation at hand to be effective (Denison et al., 1995; Havermans et al., 2015). From Bryman and Lilley's (2009) research on effective leadership in universities it can also be learnt that no single type of behaviour is always effective, but that adapting to context is essential. When the needs a leader has to attend to are more compatible, there is less contextual ambiguity and it is arguably clearer for a leader how to proceed. In contrast, in a more ambiguous context, in which demands are more competing, leaders would have less straightforward paths to manage the issues at stake. In line with the law of requisite variety (Ashby, 1952), it can then be expected that leaders would use a more complex behavioural response to navigate and cope with the various interests if the situations is more ambiguous. In sum, leaders would respond to more ambiguous contexts by using more different options from their behavioural repertoire in terms of the types of leadership behaviour.

Hypothesis 1: Leaders employ more types of leadership behaviour when the demands from their environment are more competing

Structural constraints on leadership adaptation
The task context of leaders in many public organisations is not only ambiguous, it also is characterised by complex structures. What leaders can do in such environments is complicated and possibly limited by structural factors (Johns, 2006; Pedersen et al., 2017; Perrow, 1970). In this respect, formal authority residing with a position holder is a relevant characteristic, since common reforms concerning devolution and decentralisation as part of NPM reforms and the rise of post-bureaucratic organisations[1] (Groeneveld & Van de Walle, 2011) touch on this issue. Public organisations are increasingly moving away from coordination through hierarchy only to forms of coordination in which responsibilities are spread throughout the organisation. The focus on undoing the silos and isolation and on cooperating more between organisational units across organisational boundaries to accommodate collaboration on multifaceted issues from different backgrounds, creates a situation in which lines of authority are blurring and different forms of coordination take precedence/are required (Groeneveld & Van de Walle, 2011).

Responsibilities regarding the management of such cooperation – applicable to regular tasks as well as more special projects – are divided and delegated towards multiple organisational members lower in the hierarchy, often without granting them the formal authority to fulfil their responsibilities independently (Gronn, 2002; Shamir, 1999; Van der Hoek et al., 2019). Leadership tasks are then distributed through a "segmentation of authority" (Gronn, 2002, pp.

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[1] Despite the opposite trend of increasing accountability pressures that enhance bureaucracy, which are also linked to NPM inspired reforms (Diefenbach, 2009; Lawton, McKevitt & Millar, 2000). In the university sector Bess and Goldman (1995) refer to the increase in managerial logic and bureaucratisation, moving away from more loosely coupled systems.

440-441), creating a "pluralistic domain" (Denis, Lamothe & Langley, 2001, p. 809) in which multiple actors represent various interests and objectives that are overlapping or competing to varying extents. The interdepencies thus created limit what leaders are capable of themselves. To achieve their objectives, leaders need to coordinate with others possessing needed authority. In organisations in which authority is more dispersed, interdependencies are greater, more coordination is required, and leadership is also more distributed (Gronn, 2002).

This has implications for leadership behaviour. On the one hand, the possession of formal authority would provide more opportunities for leaders to use more different types of leadership behaviour, since they have the competence to do so (Johns, 2006). On the other hand, more authority would free the way to using behaviours that provide a quicker fix for complex situations, since they could make final decisions regarding resources at their disposal (ref). Similarly, a moderating effect of fewer formal authority can also be argued in both directions. Fewer authority would put a limit on the number of types of behaviour at one's disposal, not being granted to take particular actions (Johns, 2006). On the other hand, this might require a leader to work around this obstacle to achieve a solution by trying multiple routes in parallel, involving more different types of behaviour (ref). It is therefore hypothesised that the level of formal authority connected to a position moderates the relationship between contextual ambiguity and the number of types of leadership behaviour used, without specifying the expected direction of this effect.

Hypothesis 2: The relationship between contextual ambiguity and leadership behaviour is moderated by leaders' level of formal authority

Research design

Data collection
Data were collected in a vignette study from April through June 2019. A vignette study can be used to test relationships between variables in a quasi-experimental fashion as well as to explore and gain insight in trains of thought, interpretation processes, evaluation, and considerations playing a role when determining how to behave in a particular situation (Barter & Renold, 1999; Jenkins, Bloor, Fischer, Berney & Neale, 2010; Aguinis & Bradley, 2014). Since the variables in the vignettes are manipulated by the researcher, this research method is particularly strong in terms of internal validity. To be able to assess whether leaders adapt their behaviour to context, a within-person design is employed. Each participant is presented with multiple vignettes, to see how different aspects of context lead to different choices by the same participant, while controlling for individual characteristics between participants (Aguinis & Bradley, 2014; Atzmüller & Steiner, 2010).

Vignettes were designed by drawing on cases discussed in interviews (Van der Hoek, Beerkens & Groeneveld, 2019) with leaders similar to those participating in this study. This "actual derived cases" approach enhances the realism of the scenarios, contributing to the internal and external validity of the measurements (Aguinis & Bradley, 2014; Barter & Renold, 1999; Shepherd & Zacharakis, 1999). This was supported during the actual interviews by many participants' comments about the current character of issues covered in the scenarios. The vignettes were tested in six cognitive interviews with participants from the research population and a senior researcher experienced with experimental methodologies to improve their validity, readability, and practical feasibility. A logbook was kept to keep track of decisions to change the vignettes and whether changes worked in subsequent tests. The translated vignette materials can be reviewed in the Appendix.

Sample

Vignette interviews were conducted with 30 participants holding formal leadership positions in Dutch universities (of which the first 23 interviews were ready to be analysed for this draft). This empirical setting is suitable for our research goals for several reasons. Firstly, universities are organisations particularly prone to ambiguity: "goals that are unclear, technologies that are imperfectly understood, histories that are difficult to interpret, and participants who wander in and out" (March & Olsen, 1979, p. 8). They have parallel goals and tasks in research, education, and societal outreach, which have to be managed with limited resources. Thereby they have to deal with a range of stakeholders with different interests, including employees, students, and external stakeholders such as ministries or partner organizations (Enders, 2012). Bryman and Lilley (2009) indicate that leaders within universities are confronted with various demands from these various stakeholders often compete. In combination this forms a point where ambiguity can emerge, since this creates room for various interpretations of priorities and desirable courses of action.

Secondly, dispersed formal authority involving shared responsibilities and competences is common in universities. In universities organisational members in administrative roles often possess only limited formal authority, which is shared between different formal positions. At the same time, professionals enjoy much autonomy (Bolden, Petrov & Gosling, 2009; Seeber et al., 2015). In combination with the rotating primus inter pares system, this limits authority attributed to the position ("titular authority") and favours personal expertise as source of authority over hierarchical standing in comparison to other sectors (Bess & Goldman, 1995, p. 421). This makes the university an informative setting to investigate leadership adaptation to ambiguity.

As participants we selected acting chairs, directors, and board members of departments, institutes, and teaching programmes from a variety of disciplinary backgrounds from two research universities in The Netherlands. All participants are active academics who fulfil a managerial position for a specific term, not professional administrators. We recognise that leadership behaviours is not reserved for organisational members performing administrative roles (Coleman, 1990; Gibb, 1969; Gronn, 2002; 't Hart, 2014), which is even enhanced by academe's tradition of rotating leadership of the primus inter pares kind, in which administrative roles are taken up by professionals themselves for a limited term rather than managers (Bess & Goldman, 1995; Greenleaf, 1977; Gronn, 2002). To be able to test our hypotheses using hypothetical scenarios, however, it is helpful to recruit participants who have experience with the administrative roles used in the scenarios to operationalise formal authority, since they will be able to more realistically put themselves in the position of the vignette's protagonist. Therefore sampling organisational members currently occupying such roles was considered to be an effective and valid strategy.

A list of potential participants was composed by systematic examination of university websites. Participants were randomly selected from this index, by using a fixed interval for sampling from the list. Those selected were invited by email and reminded once. Out of 63 invited persons, 32 agreed to participate, 13 declined due to a lack of time and 1 due to sick leave, and 17 did not respond to the invitations. The composition of the sample analysed (23 out of 32) is about balanced in terms of gender (14 male, 9 female participants) and type of position (12 educational, 11 non-educational). Table 1 below shows the distribution of participants within the different strata.

Table 1 Sample composition

		Male	Female	Total
Position	**Educational**	7	5	12
	Non-educational	7	4	11
	Total	**14**	**9**	**23**

Procedure

Participants are presented with a fictional case of a university department about which they have to answer to two sets of four scenarios (a 2 x 2 x 2 design). An information sheet provides some background information of the department (educational programmes, number of staff and students, institutional arrangements). Each set starts with a brief introduction to the role the participant should adopt. The scenarios present different contextual manipulations, but are identical between the two sets. After each scenario, respondents are systematically probed

about what they would do in this situation and which actors they would engage if applicable, comparable to verbally answering an open-ended survey question. After completing the vignettes and control items in the scenario booklet, the interview continues in a semi-structured fashion to discuss how participants interpreted the scenarios and made their responses. Participants are invited to share examples from their own practice similar to the scenarios and elaborate how they proceeded and how that worked out. Drawing on their own experiences with situations similar to the scenarios, these data can illustrate and provide some additional insights in/explanation of the mechanisms underlying the hypotheses.

Measurement

Dependent variable
To test behavioural adaptation, we measured ***intended leadership behaviour*** in response to the presented scenarios. After each scenario, participants were asked what they would do in this situation. This measures intended leadership behaviour as the dependent variable, because participants have to put themselves in a fictional case and therefore forms a statement of intended behaviour rather than actual observed behaviour. During the pilot testing of the vignettes is became clear that participants tend to refer to their own practice and give examples about how they dealt with the same or similar issue as central in the vignette. This signals that the measurement provides a realistic indication of how participants would behave in actual situations. Building on previous research, the types of leadership behaviour are coded using eight leadership roles matching various leadership behaviours from the model by Denison and colleagues (1995). The roles with descriptions are found in the Appendix.

Independent variables
To measure the effect of ***contextual ambiguity***, this concept is operationalised as situations in which leaders have to act and in which more or less tension between simultaneous demands is present. To incorporate such tension, situations described in the scenarios always posed two issues to be dealt with for the leader, which vary on similarity or difference between interests at stake. These two issues varied on two dimensions of contextual ambiguity, representing different types of interests that are inherent in the demands leaders are dealing with. The first dimension involves the timeline for the issues at stake. Here, the scenarios involve issues that are involve a shorter term and longer term. The second dimension is operationalised in terms of issues that vary on their main interest for the organisation as a whole and for individual organisational members. Table 2 shows how the different combinations of issues are linked to the scenarios.

Table 2 Operationalisation contextual ambiguity in scenarios

		Dimension 1: Timeline			
		Demands easier to combine (0)		Demands harder to combine (1)	
Dimension 2: Source	Demands easier to combine (0)	#1	Short + short term Department + department	#2	Short + long term Department + department
	Demands harder to combine (1)	#3	Short + short term Department + employee	#4	Short + long term Department + employee

Structural constraint is operationalised as the distribution of formal authority within the organisation, in particular the decision-making authorities residing in administrative roles. In the vignettes this takes on the values of presence or absence of formal authority regarding financial, personnel and policy decisions for the leader in the vignette, as presented to the respondent via the role descriptions.

Operationalisation of all independent variables in the vignettes can be found in the Appendix.

Control variables

After having completed the vignettes, participants filled out a short questionnaire including the control variables: Scenario experienced as most difficult (elaborated on in semi-structured interview); Age group; Gender; Current administrative position (yes/no education focus); Experience in years in current administrative position; Number of people under responsibility current administrative position; Time formally available for management tasks of current administrative position; Total experience in years in administrative positions; Prior experience with administrative positions in vignettes (yes/no); Current personnel + financial situation of own department (growth/stability/decline).

Analysis

The recorded interviews were transcribed and responses to each scenario were systematically coded for leadership behaviour. Since vignettes are standardised scenarios which are identical for all interviewees, statistical tests can be performed (Aguinis & Bradley, 2014; Atzmüller & Steiner, 2010). The within-person design creates a multilevel structure in the data: the person and the observation for a vignette each constitute a level, with observations nested in persons. When multilevel modelling is used, inferences about the effects of factors included in the vignettes as well as about individual characteristics can be made. This provides the opportunity to test how variations in context elicit different choices by the same participant, controlled for between-person differences.

In a later version of the paper, qualitative analyses of the interview data will shed further light on participants' interpretations of and responses to the scenarios.

Analysis

Preliminary analyses of the first 23 interviews are presented below. First, descriptive statistics are discussed to gain insight in the data and the existing variance. This could give a first impression about the hypotheses. Second, Analysis of Variance (ANOVA) is performed to get some first indication of the relationships between independent and dependent variables. A later version of the paper will include multilevel analysis to account for the nested structure.

Descriptive statistics

The dataset consists of 184 observations (8 observations each for 23 participants). In total, a leadership behaviour category was coded 490 times. Behaviours matching the innovator and producer categories were present least often, whereas monitor and facilitator behaviours were very common and coordinator behaviours were the most predominant (see table 3).

Table 3 Leadership behaviour categories mentioned (n = 184)

Role	Frequency	% of scenarios
Innovator	14	7,6
Broker	63	34,2
Producer	16	8,7
Director	57	31,0
Coordinator	123	66,8
Monitor	83	45,1
Facilitator	88	47,8
Mentor	46	25,0
Total	490	100

Participants' responses per scenario involved multiple categories of leadership behaviours. In only one observation, no leadership behaviour was present in the participant's response (scenario 1). Two or three types combined was most commonly found, in respectively 62 (33,7%) and 57 (31,0%) scenarios (see table 4), with a mean of 2,67 (SD = 1,127) reported types of leadership behaviour per scenario.

Table 4 Number of leadership behaviour categories in responses per scenario (n = 184)

	Frequency	% of scenarios	Cumulative %
0	1	0,5	0,5
1	24	13,0	13,6
2	62	33,7	47,3
3	57	31,0	78,3
4	30	16,3	94,6
5	7	3,8	98,4
6	3	1,6	100,0
Total	184	100,0	

Looking at between-person patterns, there is some variation in terms of the number of different leadership behaviour categories that participants used in their responses to the total set of scenarios. Only one participant used four different types, more than half of the participants used 6 or 7 different types of behaviour (table 5). On average, participants reported 6,39 (SD = 1,055) different types of leadership behaviour.

Table 5 Number of leadership behaviour categories in responses to all scenario per participant (n = 23)

	Frequency	% of participants	Cumulative %
4	1	4,3	4,3
5	4	13,0	17,4
6	9	39,1	56,5
7	6	26,1	82,6
8	4	17,4	100,0
Total	23	100,0	

Looking at the response to each scenario separately, some variation can be observed. Table 6 shows the average number of types of leadership behaviour and its variance for each scenario. Participants would respond to scenario 3 with the highest average number of leadership behaviour categories (mean = 3,70; SD = 1,222), to scenario 8 with the lowest average number of categories (mean = 1,87; SD = 0,815).

Table 6 Descriptive statistics number of leadership behaviour categories present per scenario (n = 184)

Scenario	Mean	SD	Min	Max	Variance	N
1	3,09	,996	0	5	,992	23
2	3,09	1,345	1	6	1,810	23
3	3,70	1,222	1	6	1,494	23
4	2,22	,795	1	4	,632	23
5	3,48	,898	1	4	,806	23
6	2,74	,915	1	5	,838	23
7	2,22	,850	1	4	,723	23
8	1,87	,815	1	4	,664	23
Total	2,67	1,127	0	6	1,270	184

From the types of leadership behaviours participants would use in each scenario it becomes clear that the coordinator behaviours are most common in 4 out of 8 scenarios, whereby in two scenarios all but two participants reported this behaviour category. Facilitator behaviours top the list twice, director and monitor behaviours both once. Innovator behaviours are referred to only in 3 different scenarios. Which types of leadership behaviour are used are not the focus of the hypotheses of this paper, it is about the number of different types of behaviour used per scenario. The analysis below will continue with this focus.

Table 7 Leadership behaviour categories mentioned per scenario (n = 184)

	Innovator	Broker	Producer	Director	Coordinator	Monitor	Facilitator	Mentor
1	0	16	3	7	21	16	7	1
2	7	12	2	17	10	11	10	2
3	3	14	2	5	21	8	13	18
4	0	2	1	6	9	4	18	11
5	0	7	4	4	17	18	6	1
6	4	10	3	11	14	8	11	2
7	0	2	0	5	19	9	10	6
8	0	0	1	2	12	9	13	5
Total	14	63	16	57	123	83	88	46

ANOVA

ANOVA was performed to test whether the number of intended leadership behaviour categories differed significantly in relation to the independent variables. Based on Levene's test, equality of error variance between groups was confirmed. Table 8 presents the means and standard deviations of the number of leadership behaviour types grouped by the levels of the independent variables. Table 9 shows the statistics for the model including the independent variables and their interactions.

Table 8 Mean and standard deviation for number of leadership behaviour categories per scenario by independent variables (n = 184)

Formal authority	Ambiguity short/ long term	Ambiguity department/ individual interest	Mean	SD	N
Less formal authority	Less ambiguous	Less ambiguous	2,48	,898	23
		More ambiguous	2,22	,850	23
		Total	2,35	,875	46
	More ambiguous	Less ambiguous	2,74	,915	23
		More ambiguous	1,87	,815	23
		Total	2,30	,963	46
More formal authority	Less ambiguous	Less ambiguous	3,09	,996	23
		More ambiguous	3,70	1,222	23
		Total	3,39	1,145	46
	More ambiguous	Less ambiguous	3,09	1,345	23
		More ambiguous	2,22	,795	23
		Total	2,65	1,178	46

Table 9 ANOVA: Number of leadership behaviour categories per scenario (n = 184)

	df	Mean Square	F	Partial Eta Squared
Corrected Model	7	8,186	8,227**	,247
Intercept	1	1315,565	1322,097**	,883
Main effects				
Ambiguity short/long term	1	7,043	7,078**	,039
Ambiguity department/ individual interest	1	5,565	5,593*	,031
Formal authority	1	22,261	22,371**	,113
2-way interaction effects				
Ambiguity short/long term * Ambiguity department/ individual interest	1	12,522	12,584**	,067
Ambiguity short/long term * Formal authority	1	5,565	5,593*	,031
Ambiguity department/ individual interest * Formal authority	1	2,174	2,185	,012
3-way interaction effect				
Ambiguity short/long term * Ambiguity department/ individual interest * Formal authority	1	2,174	2,185	,012
Error	176	,995		
Total	184			
Corrected Total	183			

* p < .05; ** p < .01

For each independent variable, there is an indication that there is an effect on the dependent variable, since the group means for the variable levels differ significantly at the 95%-confidence level. Moreover, the interactions between the two dimensions of ambiguity and between timeline ambiguity and formal authority show that there is a significant difference in group means. This means that there would be an effect of context on leadership behaviour.

The direction of hypothesis 1, however, does not seem to match the data, since the mean number of leadership behaviour categories intended is higher for the less ambiguous scenarios than for the more ambiguous scenarios (see table 8).

Regarding hypothesis 2, it appears that more different types of leadership behaviour are reported for scenarios with more formal authority. Since the three-way interaction of formal authority with both other independent variables is not significant, it could mean that there is no moderating effect of formal authority as hypothesised, only a direct effect on the dependent variable.

It must be noted that this analysis does not account for the multilevel structure, so no conclusions regarding the hypotheses will be drawn from this.

Discussion

The analysis reported in this paper is only preliminary and will be expanded in several ways. Firstly, only a subset of the total data that will be available has been analysed here. Subsequent analyses will include responses on each scenario of 32 participants, leading to 265 observations in total. Secondly, the nested structure caused by the within-person design has not been accommodated thus far. A next step is to account for this by performing multilevel analysis, so that within-person variance can be controlled for between-person variance. Thirdly, the qualitative aspect of the data that have been collected will be included to provide further insights in the impact of context on leadership behaviour. The examples provided by participants regarding their own experiences and considerations when dealing with dilemmas will be analysed to illustrate patterns and provide alternative explanations where relevant.

This might especially be interesting in case the pattern reversed to hypothesis 1 as observed in the presented ANOVA also shows in the multilevel analyses of the complete sample. Since the direction of our hypothesis – more ambiguity would be accompanied by more different types of leadership behaviour – seems to be the opposite of the pattern in the data, questions are raised regarding the meaning and experience of ambiguity by leaders. Interestingly, participants answered differently to the control question asking which scenario they experiences as the most difficult scenario. Discussing the participants' answers in the semi-structured part of the interview could give suggestions of when situations are perceived as more ambiguous. Instead of having very different issues combined, more of the same could cause more pressure leading to ambiguity concerning how to solve the puzzle. Ambiguity is a thorny concept, which makes it challenging to study.

Limitations

This study intends to test hypotheses about leadership behaviour adaptation to context. It should be noted that the current measurements present an approximation rather than an observation of behavioural adaptation. Since with vignettes actual behaviour is not observed, its use for studying behaviour – or predicted behaviour – as the dependent variable deserved some

caution. Jenkins et al. (2010) discuss how motivational cues to engage in the interpretation process of a particular studied type of situation differ in a research (hypothetical) setting and a participant's own (actual) setting, because there is no need to act in the research setting. This has an influence on the thinking of participants, which causes that how a participant interprets and formulates intended behaviour in a vignette interview is different from a situation that does require the participant to act and the considerations and intended behaviour likely differ from a real-life situation. This is a limitation of the vignette methodology and conclusions should be treated with caution. Nevertheless, a vignette study can provide better insight in how the thinking process could be in actual situations. The method's main strength can be found in the internal validity of the manipulation of contextual factors, which could not be under the researcher's control in a field experiment. Since a field experiment to test our hypotheses would not be feasible, the vignette study offers an opportunity to test our hypotheses.

Moreover, only two dimensions of contextual ambiguity were included, although others could be relevant. This test of the hypotheses is then limited in scope, further research necessary. On the other hand, it was necessary to keep some variables constant to allow control over them, since our methodology restricts a larger number of scenarios per participant or a much larger sample to be able to cover all possible set combinations and its effects on the responses. To be able to assess the effects of the variables included, we decided on including limited yet as relevant identified factors in the design.

The trade-off between the number of variable levels and the feasibility of generating enough data with a much larger number of scenarios makes that not all relationships may have been detected. Because only two values on each variable were included, potential (inverted) U-curve relationships are not possible to detect. Such curvilinear relationship could be argued for hypothesis 1, since there is only so much a leader can do and it is probably not realistic to assume that someone will continue to add more behaviours after some point – with having only limited time/attention/resources available to a leader and having to do other things as well next to dealing with the issue(s) at hand. Maybe this is more relevant to consider in an observational study than in this type of design where context varies to a limited extent. A similar relationship might go unnoticed for hypothesis 2.

To test the robustness of our findings and overcome some of the limitations, further research should continue this line of research by 1) adopting a different method to address the measurement of the dependent variable and 2) testing the external and ecological validity of the relationships in larger representative samples of different populations.

A final trade-off concerns the order in which scenarios are presented to participants. No randomisation of scenarios was used. Since our number of participants is limited due to feasibility issues, the number of combinations in which scenarios could be ordered exceeded the sample size. Randomising the vignette order would not allow us to control for possible order effects. Vignette order was therefore kept constant for all participants.

Despite these restrictions, our data show that context is an important variable to study when we want to understand leadership behaviour. In many public organisations ambiguity is widespread and, per this study, not without consequences for leadership. Further research to investigate the impact of context is therefore not only of theoretical interest, but also of practical value.

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Appendix: Operationalisation

Dependent variable: Leadership behaviour

Table A1 Leadership behaviour categories (Denison et al., 1995, pp. 527-528)

Role	Description
Innovator	The innovator is creative and envisions, encourages, and facilitates change.
Broker	The broker is politically astute, acquires resources and maintains the unit's external legitimacy through the development, scanning, and maintenance of a network of external contacts.
Producer	The producer is the task-oriented, work-focused role. The producer seeks closure, and motivates those behaviours that will result in the completion of the group's task.
Director	The director engages in goal setting and role clarification, sets objectives, and establishes clear expectations.
Coordinator	The coordinator maintains structure, does the scheduling, coordinating, and problem solving, and sees that rules and standards are met.
Monitor	The monitor collects and distributes information, checks on performance, and provides a sense of continuity and stability.
Facilitator	The facilitator encourages the expression of opinions, seeks consensus, and negotiates compromise.
Mentor	The mentor is aware of individual needs, listens actively, is fair, supports legitimate requests, and attempts to facilitate the development of individuals.

Independent variable: Formal authority

Introduction role 1 (more formal authority):
In the next four scenarios you are **head of department** of Political Science. Together with the director of education and supported by the financial manager you make up the board, with whom you have weekly meetings. In your position you are responsible for the day-to-day wellbeing and the strategy of the department and you are responsible for the budget. In your position you have the capacity to decide about hiring personnel and you have the last say in policy decisions of your department.

Introduction role 2 (less formal authority):
In the next four scenarios you are **programme director of bachelor studies** of Political Science. In your position you are responsible for quality of the Dutch bachelor programme. Besides you are the direct contact person for teaching staff. In your position you do not have the capacity to decide about hiring personnel, the board of the department decides upon those issues.

Independent variable: Contextual ambiguity

Table A2 Operationalisation contextual ambiguity in scenarios

		Dimension 1: Timeframe			
		Demands easier to combine (0)		Demands harder to combine (1)	
Dimension 2: Source	Demands easier to combine (0)	#1	Short + short term Department + department	#2	Short + long term Department + department
	Demands harder to combine (1)	#3	Short + short term Department + employee	#4	Short + long term Department + employee

Scenario 1:

The bachelor programmes of your department will grow more than expected in the coming academic year, but the budget will not yet grow along accordingly. It becomes very difficult to arrange the allocation of staff for all teaching tasks. At the same time you are preparing the visitation of the educational programmes, which has to be reaccredited in the coming months. You also need your staff to prepare all documents and meetings. U need your teaching staff for various matters, but time is limited and work pressure high.

Which actions would you undertake, and if applicable, which stakeholders do you involve?

Scenario 2:

The bachelor programmes of your department will grow more than expected in the coming academic year, but the budget will not yet grow along accordingly. It becomes very difficult to arrange the allocation of staff for all teaching tasks. At the same time you working on the development of additional interdisciplinary elements in your educational programmes, to secure future viability. To be able to receive structural financial funding from the school, you have to materialize these developments in the coming months. Then you will be able to use them to promote your programmes among potential future students from next year onwards.

Which actions would you undertake, and if applicable, which stakeholders do you involve?

Scenario 3:

The bachelor programmes of your department will grow more than expected in the coming academic year, but the budget will not yet grow along accordingly. It becomes very difficult to arrange the allocation of staff for all teaching tasks. Your teaching staff already experience high work pressure, two coordinating teachers are on sick leave due to burnout. It has proven to be difficult to find new teachers to fill up the teaching hours and unburden other teaching staff. A third coordinating teacher has given you notice that she has been invited by an excellent research institute in the United States to spend a sabbatical during the second semester. Her teaching tasks would have to be reallocated to someone else.

Which actions would you undertake, and if applicable, which stakeholders do you involve?

Scenario 4:
The bachelor programmes of your department will grow more than expected in the coming academic year, but the budget will not yet grow along accordingly. It becomes very difficult to arrange the allocation of staff for all teaching tasks. At these times of scarcity and high work pressure, a coordinating teacher in your bachelor programme has told you that he has been offered the opportunity to make a television show on social science and research. This would generate a lot of positive attention for himself and his career. He would also be less available for teaching, although he teaches a core module in the programme.

Which actions would you undertake, and if applicable, which stakeholders do you involve?