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Article

Organizational Rules and Cognitive Uncertainty Among Public Professionals: A Daily Diary Study

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Abstract

Although public management and human resource management research has extensively investigated the motivational effects of organizational rules, the original utility of organizational rules—uncertainty reduction—has remained overlooked. This study takes a cognitive perspective by examining how organizational rules relate to uncertainty experiences of public professionals. In this study, we provide a dynamic perspective on the relationship between organizational rules and uncertainty through a 2-week daily online diary study among 65 public professionals in the Netherlands. The results indicate that the amount and consistency of rules are related to professionals' daily uncertainty experiences. Moreover, within-person experiences of rules and uncertainty are highly variable over time. We argue that a cognitive perspective of uncertainty reduction can broaden our understanding of the consequences of organizational rules in managing people, and that the dynamic nature of organizational rule experiences cannot be a mere footnote in future public administration and human resource management research.

Keywords

diary study, cognitive uncertainty, rule characteristics, formalization, red tape, green tape

Introduction

Clear and consistent rules are an important part of managing people in public organizations, but from the outset, research on bureaucracy and organizational rules has been

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Janus-faced (Gouldner, 1955), with one branch of research focused on the technical functionality of rules, and another on the negative, coercive aspects of rules (Adler & Borys, 1996; Van Loon et al., 2016). The positive view of bureaucratic organizations emphasizes that organizational rules ensure precision, reliability, calculability, and accountability through the standardization of work (Gajduschek, 2003). Organizations that achieve standardization through rules are commonly referred to as bureaucracies (Mintzberg, 1979). By ensuring highly predictable processes and outputs, uncertainty reduction is the central aim of the bureaucratic organizational form (Gajduschek, 2003). The negative view on bureaucracy and organizational rules emphasizes the coercive and dehumanizing aspects of rules. In this view, rules stifle creativity of employees, demotivate them and are only in place to enforce employee's compliance (Adler & Borys, 1996). For public HRM scholars and practitioners, identifying the right balance of rules to reduce uncertainty but not stifle creativity and motivation thus remains a continuing challenge.

In the public administration literature, the negative view on organizational rules mostly dominates. Researchers devote much attention to the concept of red tape, defined as "rules, regulations, and procedures that remain in force and entail a compliance burden for the organization, but have no efficacy for the rules' functional object" (Bozeman, 1993, p. 283) and, more recently, to the concept of administrative burdens (Herd & Moynihan, 2019). The negative consequences of organizational rules for employees have been exclusively examined through the lens of motivational theories. For instance, organizational rules may decrease employees' autonomy or crowd-out intrinsic motivation (Jacobsen & Jakobsen, 2018). Recently, a number of studies have paid attention to the beneficial effects of organizational rules, focusing on the concept of green tape (DeHart-Davis, 2017). However, also in these studies, motivational theories are the key mechanism through which the effects of rules on employees are studied. For instance, rules that provide the optimal amount of control are found to increase job satisfaction by altering an employee's sense of self-determination (DeHart-Davis et al., 2014).

The exclusive focus on the motivational effects of organizational rules on employees overlooks the original purpose through which rules are intended to affect employees: uncertainty reduction (Weber, 1972 [1922]; see Gajduschek, 2003, pp. 714–716). In this article, we therefore aim to add to the literature on organizational rules by taking a cognitive perspective on rules and examining the reduction of cognitive uncertainty for employees as an alternative mechanism through which organizational rules affect public professionals. Under conditions of bounded rationality, human cognition is seen as limited due to the incomplete knowledge of situations and of behavioral alternatives (Simon, 1970). Rules then provide a heuristic or mental shortcut in decision-making and are thus expected to reduce cognitive uncertainty (see also Raaphorst, 2018). We view organizational rules as positive when they reduce cognitive uncertainty among professionals and as negative when they fail to reduce or even contribute to cognitive uncertainty.

In order to get a better understanding of how rules may contribute to uncertainty reduction, this article focuses on the characteristics of rules that are potentially associated with uncertainty reduction. Our central research question is: *To what extent are*

organizational rules and their characteristics associated with the reduction of cognitive uncertainty? We examine this question through a daily online diary study among public professionals and utilize two focus groups to further interpret the results of the diary study.

Uncertainty and the reduction thereof is of increasing importance. The public sector is more prone to uncertainty than the private sector due to its inherently ambiguous goals, complex tasks, and multitude of stakeholders (Boyne, 2002). This is exacerbated by recent shifts in organization forms, focusing more on flexibility and responsiveness of organizations and less on standardization of the work, leading to increasing levels of cognitive uncertainty for professionals (Groeneveld, 2016; Raaphorst, 2018; Van der Voet & Steijn, 2019; Van de Walle, 2016). Our study aims to connect research that emphasizes the micro-processes of cognitive uncertainty among public professionals (Raaphorst, 2018) with research on the characteristics of organizational rules (Adler & Borys, 1996; DeHart-Davis, 2017). By answering our central question, this article contributes to the public administration and HRM knowledge base in three different respects.

First, this study takes a cognitive perspective to organizational rules by positing uncertainty reduction as an alternative mechanism that may account for the beneficial or pathological effects of organizational rules on employees. In doing so, our study expands on what is currently seen as the main theoretical explanation for the effects of rules in public sector organizations: theories of motivation such as self-determination theory (Deci & Ryan, 1985) and motivation-crowding theory (Frey & Jegen, 2001). Our novel approach thus contributes to a broader understanding of how rules may affect organizational reality and in particular the process of managing people in the public sector.

Second, this study focuses on rule characteristics. Public administration research has had limited attention for the characteristics of rules and their effects on employees (DeHart-Davis, 2017). For instance, research focuses on degrees of red tape and formalization, rather than their characteristics (e.g., Jacobsen & Jakobsen, 2018; Scott & Pandey, 2005). As a consequence, the rule characteristics that explain why some rules are perceived as burdensome while others are not, are currently not well understood. A focus on specific characteristics of rules in relation to uncertainty reduction strengthens our theoretical understanding of the way in which rules function in reducing cognitive uncertainty, by more precisely pointing at the type of rules that play a role in uncertainty reduction. Furthermore, it also enables us to offer practical considerations of which rule characteristics enhance rule effectiveness and could be useful for the HRM process (Borry et al., 2018).

Third, this study makes a methodological contribution by introducing a dynamic empirical approach to study organizational rules and cognitive uncertainty. Where previous research on organizational rules relies mainly on cross-sectional survey data (Bozeman & Feeney, 2011; Pandey & Marlowe, 2015), this study uses a diary study to uncover the within-person variation in experiences with organizational rules and cognitive uncertainty (Ohly et al., 2010). While public professionals may on average face a high degree of rules as well as uncertainty, it is likely that considerable variation

exists from day to day. This variation has been ignored in previous research using aggregated measures of red tape and rule characteristics (e.g., Borry et al., 2018; DeHart-Davis et al., 2014; Jacobsen & Jakobsen, 2018; Scott & Pandey, 2005; Van Loon et al., 2016). The use of a diary study, which is sensitive to such variation and has a high internal and ecological validity, thus constitutes a major improvement over current research into rule characteristics and red tape and a contribution to the HRM knowledge base.

The article is organized as follows. We start our article by presenting the theoretical case for the relationship between organizational rules and cognitive uncertainty. We then proceed with the methodology and provide justification for our case selection. After presenting the findings of the diary study, we interpret the findings drawing on the data obtained through the focus groups. In the final section, we discuss the findings in light of the literature and highlight the implications of our study for future research.

Theoretical Framework and Hypotheses

Bureaucracies aim to reduce uncertainty, not only at the top of the organization and for citizens, but also for public employees working in these organizations (Groeneveld, 2016). Cognitive uncertainty among public professionals can have several different causes: incomplete information, unclear information, and conflicting information (Michel, 2007; Raaphorst, 2018). Uncertainty caused by incomplete information is rooted in literature on administrative behavior (Downs, 1966; Simon, 1970). Scholars in this field started to recognize the human factor in decision-making and with this came uncertainty. Uncertainty in this perspective takes the form of "unknowns" (Raaphorst, 2018): incomplete knowledge of the situation, rules, and procedures. Uncertainty caused by unclear information is different from this. Building on street-level bureaucracy literature (Lipsky, 1980), uncertainty is in this perspective seen as a problem of interpreting ambiguous information. Finally, also decision-making under conditions of conflicting or contradictory information can be a source of uncertainty (Carrigan, 2017; Michel, 2007). Cognitive uncertainty can thus be defined as experiences of incomplete, unclear or conflicting information in the employee's work.

The central mechanism by which bureaucracies reduce cognitive uncertainty is the standardization of work (Gajduschek, 2003). This standardization often takes the form of rules, both written, formal rules and unwritten, informal rules. Organizational rules can be defined as "requirements for specific organization behaviors under particular circumstances" (DeHart-Davis et al., 2013, p. 333). Organizations are able to reduce complex environments to manageable proportions (Meyer, 1985) and by means of rules they specify behavioral requirements for employees and thus provide clarity of what is expected of them under specific circumstances. In this way, organizational rules facilitate consistency of the work and they contribute to predictability of outputs (what to do) and procedures (how to do it). From a HRM perspective, uncertainty reduction could furthermore positively impact the work experience of employees since too high levels of cognitive uncertainty have been associated with negative outcomes such as work stress and absenteeism (Schmidt et al., 2014). By specifying what

is expected of employees, rules thus provide uncertainty reduction for employees (Gajduschek, 2003). We therefore hypothesize that:

H1: The amount of rules is negatively related to employees' experiences of cognitive uncertainty.

In addition to the general argument that rules and procedures lead to less uncertainty, it is important to investigate different characteristics of rules in relation to cognitive uncertainty of public professionals. In this study, we concentrate on the characteristics of the entire population of rules and not on the characteristics of individual rules. This perspective enables us to concentrate on the general perception that employees have of the rule population in relation to their uncertainty experiences (Jacobsen & Jakobsen, 2018). When doing their work, public professionals may encounter several rules at the same time. Cognitive uncertainty can not only be caused by the characteristics of single rules, but also by the characteristics of a set of rules, such as the (in-)completeness and (in-)consistency of the population of rules. Focusing on the population of rules better reflects organizational reality and enables more in-depth theorization regarding rule characteristics.

A first characteristic is the degree to which the rule population is formalized. Formalization describes the extent to which rules, policies, and procedures in the organization are written (Pugh et al., 1968). Formalization of rules is expected to reduce cognitive uncertainty by making interactions more predictable for employees (Walsh & Dewar, 1987). Putting rules into writing ensures their verifiability and protects employees against arbitrariness (DeHart-Davis, 2017). Written rules, furthermore, leave less room for different interpretations, thus reducing cognitive uncertainty caused by unclear information, and for incompliance (DeHart-Davis et al., 2014). Finally, formalized rules have in most cases been subject of greater scrutiny than unwritten rules and are therefore generally of higher quality than unwritten rules (DeHart-Davis et al., 2013). This leads to the following hypothesis:

H2: The degree to which rules are written is negatively related to employees' experiences of cognitive uncertainty.

A second rule characteristic is the degree to which rules are enabling rather than coercive (Adler & Borys, 1996). Enabling rules are those rules and procedures that permit employees to perform well in their work. These rules do not spell out every conceivable work situation, but they do enable employees to effectively deal with the inevitable contingencies of the work. Coercive rules on the other hand are not in place to guide employees' effort, but instead to enforce compliance (Adler & Borys, 1996). Unwritten coercive rules that emerge bottom-up in post-bureaucratic organizations could feel just as coercive, or even as "tighter than the iron cage of bureaucracy" (Barker, 1993). Both enabling and coercive rules are a part of Weber's notion of the bureaucracy (Weber, 1972 [1922]). However, coercive rules may contribute less to uncertainty reduction for employees than enabling rules, since enabling rules serve the

interests of employees in guiding their effort, whereas coercive rules are in place to serve the management and thus have no influence on the level of cognitive uncertainty for employees (Adler & Borys, 1996). We therefore hypothesize that:

> H3: The degree to which rules are enabling rather than coercive is negatively related to employees' experiences of cognitive uncertainty.

Organizational rules can not only differ in the goal they serve (enabling or coercive) also the object of organizational rules can differ. Pedersen and Ejersbo (2019) make a distinction between rules that focus on service-oriented work tasks and rules that focus on administrative tasks. The former concern rules that are closely related to what professionals see as their core executing tasks, while the latter concern rules that are in place to guide administrative work tasks, such as documentation. From the perspective of self-determination theory, rules that focus on the core work task of professionals (i.e., service provision) are seen as negative since they limit professionals in how they execute their work. We come to a different evaluation of these rules from a cognitive perspective of uncertainty reduction. Cognitive uncertainty mostly concerns the core work tasks of public professionals, because of the complexity and unpredictability of working with clients (Raaphorst, 2018). Therefore, we expect that service-oriented rules and regulations contribute more to uncertainty reduction than rules that only serve a role in administrating work. We thus hypothesize that:

> H4: The degree to which rules focus on service-oriented instead of administrative tasks is negatively related to employees' experiences of cognitive uncertainty.

Another relevant rule characteristic is the degree to which rules are perceived as useful. This rule characteristic can be derived from the literature on red tape (Bozeman, 1993; Van Loon et al., 2016). Red tape constitutes a specific type of organizational rules that is by definition seen as a pathology. Red tape is composed of rules that have no efficacy for the rules' functional object and thus do not serve any useful goal in the organization (Bozeman, 1993). This lack of functionality of the rules can be caused by the fact that these rules never had a functionality or by the fact that they have lost their functionality, for example because the object of the rule has changed in a way that makes the rule obsolete (Bozeman & Feeney, 2011). Rules that have no value for the rules' functional object are also problematic from the viewpoint of uncertainty reduction, since they may raise more questions than they provide answers to and thus do not contribute to uncertainty reduction. We therefore hypothesize that:

> H5: The degree to which rules are useful is negatively related to employees' experiences of cognitive uncertainty.

Finally, also the consistency of the rule population can be expected to be an important determinant of uncertainty, especially in a public-sector context where employees often have to deal with several, competing values that may be translated into

contradictory or inconsistent rules (Hood, 1991). Green tape literature focuses on the consistent application of rules and shows the detrimental motivational effects of inconsistently applied rules (DeHart-Davis, 2017; DeHart-Davis et al., 2014). Similarly, rules that are in themselves clear and have a clear functional object can become a compliance burden when they conflict with each other (Bozeman & Feeney, 2011; Kaufman, 1977). In this study, we understand this as an inconsistency in the rule population. We focus on this phenomenon of inconsistencies within the rule population rather than on inconsistent rule application since this constitutes a characteristic of the rule population whereas consistent application of rules is a behavioral feature—and in this article, we aim to draw conclusions on rule characteristics and not on rule following behavior. An example of an inconsistency in the rule population is the conflicting demands that legislation protecting privacy and legislation requiring freedom of information impose on bureaucrats (Kaufman, 1977, p. 12). We expect that inconsistent rules impose dilemmas for professionals on which rule to follow and therefore cause cognitive uncertainty. On the other hand, consistent rules provide clear expectations for behavior and thus reduce uncertainty for employees. We therefore hypothesize that:

> H6: The degree to which rules are consistent is negatively related to employees' experiences of cognitive uncertainty.

Methodology

Empirical Setting

As an empirical setting, we study public professionals working in the social welfare sector in The Netherlands. This case is considered rich in terms of potential uncertainty experiences as well as in terms of rules. The work of social welfare professionals is complex due to the complexity of their tasks, and they are currently amidst an ongoing reform that emphasizes a new way of working as well as a new team-based organizational structure (Van Zijl et al., 2018). Their work is highly formalized with rules that are imposed by different actors on different levels: the organization, the team, the municipality, their profession, as well as formal laws and legal requirements (cf.Pedersen and Ejersbo, 2019). Furthermore, they work in a professional context in which informal rules are expected to play a substantial role as well. We, therefore, expect that the case provides us with ample opportunities to study the relationships between cognitive uncertainty and rule characteristics.

Research Design

In this study, we use a diary design for data collection (Ohly et al., 2010). This is a method of data collection in which participants respond in real-time to repeated assessments at multiple moments, while functioning within their natural settings. As such, diary studies combine a high internal validity with ecological validity, since they allow

researchers to study rule perceptions in real-life settings. We believe that this method has several strengths that expand our understanding of the cognitive consequences of organizational rules.

A first strength of this method is that the longitudinal measurement of participants allows for a within-person approach studying variation over time while controlling for individual differences. Since individual differences may confound experiences of rules and cognitive uncertainty, this method enables us to better isolate the relationship between rule characteristics and cognitive uncertainty. Studying this intra-individual variation may uncover mechanisms that are overlooked in prior empirical work using aggregated measures of red tape and organizational rules (e.g., Borry et al., 2018; DeHart-Davis, Davis and Mohr, 2014; Jacobsen & Jakobsen, 2018; Scott & Pandey, 2005; Van Loon et al., 2016).

Second, diary studies have a high ecological validity since they allow for studying public professionals in their natural setting. This is important since experiences of organizational rules and uncertainty may be transient and this method enables us to make strong connections between experiences and situations (Scollon et al., 2003). Rule characteristics and uncertainty experiences may differ widely between days and depending on situations. By using a diary study, we can study the contingencies of uncertainty experiences much more precisely than is possible using cross-sectional, static methods.

Third, because of real-time and longitudinal measurement, this method offers the opportunity to reduce memory biases (such as rationalization) that are inherent in self-reported measures of organizational rules. This corresponds with recent developments within the field of organizational psychology, in which researchers have become more interested in studying *everyday experiences* of individuals (Ohly et al., 2010). This development could also offer a valuable contribution to research on red tape and organizational rules since most research into these topics focuses on general experiences with rules, which might be distorted by retrospection biases such as a "peak-end rule," meaning that respondents give more weight to how a situation was at its most extreme (peak) and in most recent times (end) (Bolger et al., 2003). A possible drawback of diary studies is the higher risk of attrition among respondents (Scollon et al., 2003). We aimed to minimize attrition by personally briefing the respondents about the aim and practical implications of the study, thus enhancing compliance by creating a "spirit of collaboration and respect" between researchers and respondents (Ohly et al., 2010, p. 87).

Measures

There is an inherent subjectivity when it comes to measuring both organizational rules and cognitive uncertainty perceptions. Kaufman (1977, p. 4) mentions that "one person's red tape may be another's treasured safeguard" and uncertainty is also a perceptual phenomenon (Raaphorst, 2018). Studying perceptions has regained attention in recent research on red tape (Jacobsen & Jakobsen, 2018; Pedersen and Ejersbo, 2019; Van Loon et al., 2016). The inherent subjectivity of the variables and the fact

that perceptions have real life consequences makes the use of questionnaire items appropriate for this study (George & Pandey, 2017). Furthermore, the within-person design of this study reduces common source bias by isolating the relationships of interest from time-invariant, individual differences (Scollon et al., 2003).

Dependent variable. To the best of our knowledge, there are no existing survey items to measure cognitive uncertainty. We therefore created and validated a new item for use in the present study. Based on previous qualitative research (Michel, 2007; Raaphorst, 2018) we conceptualize cognitive uncertainty as experiences of incomplete, unclear, or conflicting information in the employee's work. Our measure was designed to retrospectively capture the uncertainty professionals experienced over the course of a working day and it was sent to respondents towards the end of the working day. For this purpose, a single item measure was developed: "To what extent did you encounter difficult situations in your work today, as a consequence of a lack of information, unclear, or conflicting information?" The answer options range from 1 "no difficult situations" to 10 "many difficult situations."

Independent variables. All the independent variables were measured using single item measurement instruments scored on a scale of 1 to 10. Single item measurement was chosen in order to keep the daily diary short and prevent a high attrition rate among participants (Ohly et al., 2010). An overview of the items can be found in Appendix 1. Some items were based on existing survey questions but adapted to the specific use in a diary study (e.g., the phrasing "the rules I encountered *today*" was added). This applies to the items about the extent to which rules are written (based on DeHart-Davis et al., 2013) and the item about the usefulness of rules (based on Van Loon et al., 2016). The item on rule consistency was based on DeHart-Davis's (2017) item on consistent rule application, but the focus was changed from rule application to the rule characteristic. The item on the degree to which rules focus on service-oriented work tasks versus administrative tasks is based on Pedersen and Ejersbo (2019) but formulated in a continuum—from focusing completely on service-oriented tasks to focusing completely on administrative tasks. For enabling versus coercive rules, there is no quantitative measurement (Adler & Borys, 1996), so we formulated this item ourselves. The same goes for the item measuring the amount of rules, since existing items tend to focus on the degree of formalization rather than on the amount of rules.

Data collection. The data was collected successively in the participating teams in the period June—October, 2018. Respondents were asked to fill in a daily questionnaire for a period of 2 weeks. The questionnaire was sent to the respondents towards the end of the working day at 3.30 pm. Respondents were instructed to fill in the diary on the day it was sent to them. Prior to the start of the research, the respondents were briefed by the first author in order to explain the research and in order to improve compliance (Ohly et al., 2010).

In total 93 professionals were approached working in six different social welfare teams in a large Dutch municipality. In total 65 respondents filled in the daily

questionnaires resulting in a total of 270 completed daily surveys. This means a response rate of 70% of respondents. The respondents work on average 4 days per week. Not all respondents filled in the questionnaire every day; the response rate of the daily questionnaire is 52%. This percentage is consistent with previous scholarship using this method, in which typically between 40 and 120 respondents are included, filling in daily questionnaires for a period of 5 to 10 days (De Vries et al., 2018; Ohly et al., 2010). The sample consists of 47 women and 10 men. For eight respondents, we do not have data about their gender, age, and prior work experience. The gender distribution corresponds with the sex ratio in the field of social work in the Netherlands, in which a large majority of employees is female. The mean age of the respondents is 40 years old, ranging from 25 to 63 years of age. Although the work in the teams is new, most respondents already have experience as a social welfare professional. This averages at a little over 9 years, ranging from 0 to 39 years of experience.

The data from the diary study are supplemented with data from two focus groups with professionals who work in the social welfare teams. The focus groups consist of five and six respondents respectively and were conducted by the first author of this article. Most, but not all, participants of the focus groups had previously participated in the diary study. The participants were not told what the findings of the diary study were, and they were asked to respond to the same statements as those that were used in the diary study. This was used as a starting point for a discussion on the mechanisms through which rules with certain characteristics contribute to cognitive uncertainty (reduction). In this way, the focus groups help in explaining why some hypotheses could not be confirmed or gave a result in the direction opposite to what was hypothesized.

Analytical Strategy

The data has a hierarchical structure with days nested in persons. Because this leads to interdependent observations, a multi-level approach is the most appropriate way of analysis (Snijders & Bosker, 2012). We analyzed the data using a multi-level regression analysis in Stata. We performed a Hausman test in order to determine whether a fixed-effects or a random-effects model is most appropriate. Given the fact that the Hausman test provided a significant result (chi^2 = 14.05; p = .03), we used a fixed-effects model in the analysis (cf. Kjeldsen & Jacobsen, 2013). Cases with missing data at the day level were not deleted. It is possible to work with partially missing data in multilevel modeling since this method does not hold the assumption that there is an equal number of observations per respondent or that there are fixed time points. Moreover, it is important not to delete cases with missing data, as the deletion of these cases could result in biased parameter estimates (Grund et al., 2019; Snijders & Bosker, 2012).

The focus group discussions were transcribed verbatim. We then coded the transcripts using two steps. First, we coded fragments that indicate uncertainty experiences (for instance, the mentioning of "difficult situations caused by incomplete, unclear or conflicting information") or rule characteristics. Second, we coded instances where rules with certain characteristics were associated with higher or lower levels of

Table 1. Descriptive Statistics: Observed Range, Mean, Standard Deviation, and 1-ICC[ab].

	Observed range	Mean (n = 270)	SD (n = 270)	Mean (n = 65)	SD (n = 65)	1-ICC
Cognitive uncertainty	1–10	4.91	2.55	4.91	2.01	0.758
Amount of rules	1–10	5.71	2.00	5.70	1.25	0.635
Degree to which the rules are written	1–10	6.18	1.96	6.25	1.32	0.699
Degree to which the rules are coercive	1–10	5.31	2.04	5.22	1.42	0.708
Degree to which rules focus on administrative versus service-oriented tasks	1–10	5.96	2.19	5.82	1.62	0.733
Degree to which the rules are useful	1–10	5.67	1.89	5.71	1.32	0.696
Degree to which the rules are consistent	1–10	5.28	2.08	5.26	1.41	0.747

Note. In Table 1 we present the 1-ICC score, which represents the amount of variance at the within-person level.
[a]The ICC scores are calculated as follows (Bliese, 1998): ICC = (MSB − MSW)/(MSB + (k − 1) × MSW). MSB = mean square between groups; MSW = mean square within groups; k = group size.
[b]We do not report correlations of the variables at the day level, since these are not independent of the person level. Therefore, a correlation matrix does not provide an accurate overview of the bivariate correlations.

uncertainty and why this was the case. This method was used to find relevant interview fragments and to analyze how rules with certain characteristics contributed to cognitive uncertainty or to the reduction thereof.

Results

Descriptive Analysis

First, as Table 1 shows, considerable variance in the scores of respondents across days can be observed. Especially the amount of cognitive uncertainty professionals experience varies considerably from day to day within the same respondent. While the mean score of cognitive uncertainty is moderate (4.91; ranging from 1 to 10), values both substantially higher and lower are common within the same respondent, given the within-person standard deviation of 2.01.

In terms of rule characteristics, it is especially noteworthy to mention that the rules which the professionals encounter are to a relatively large extent written (6.18 on a scale of 1–10). Although substantial variation across days can be observed (within-person standard deviation is 1.32), this is consistent with our assumption that public organizations are to a relatively high extent subject to written rules. The within-person standard deviations of the amount of rules and the rule characteristics vary from 1.25 for the amount of rules to 1.62 for the degree to which rules focus on administrative tasks instead of service-oriented tasks. This indicates that for all variables, substantial variation exists across days within the same respondent. This point is illustrated in Figure 1, which shows the boxplots of the within-person variance of the variables. These visualizations show that the interquartile range, indicating the middle 50% of scores, is substantially large for all variables (ranging from 1.71 for the degree to which rules are useful to 2.75 for cognitive uncertainty). This further indicates that the scores that a respondent gives to these variables varies considerably across days.
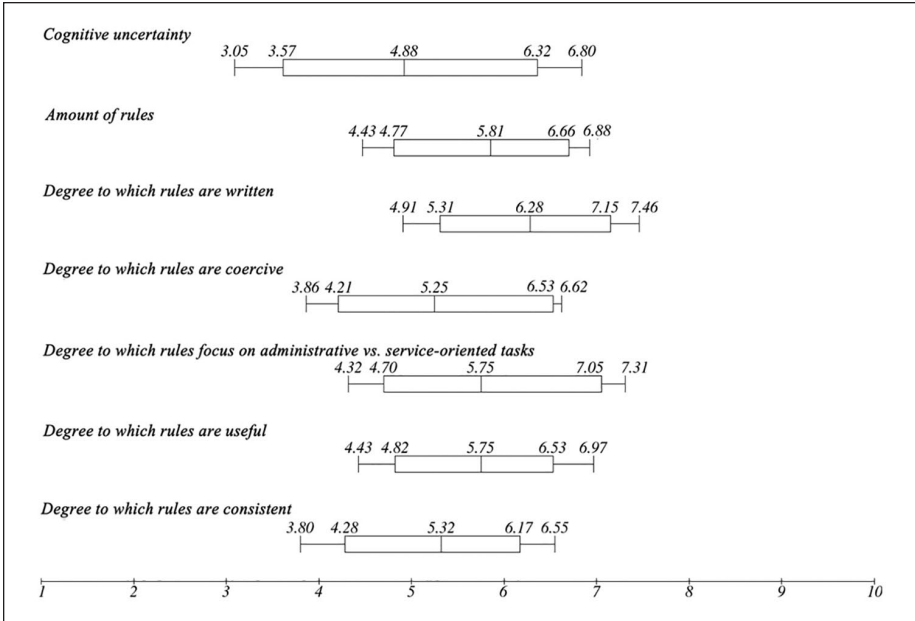
Figure 1. Boxplots of the within-person variance of cognitive uncertainty, the amount of rules and rule characteristics (*n* = 65 professionals).

Variance Decomposition

Multilevel modeling is justified when sufficient variance is present at both the within-person level and the between-person level. This can be determined by calculating the intraclass correlation coefficient (ICC; Snijders & Bosker, 2012). In Table 1 we present the 1-ICC values indicating the amount of variance that is explained at the within-person (i.e., day) level for each variable. These values show that most of the variance (between 64% and 76%) is explained at the within-person or day level. This implies that most variation in experiences of organizational rules cannot be captured by methods that aggregate rule experiences into a static, general measure. This demonstrates the importance of using a method that is sensitive to such variation. For instance, when we look at one typical respondent, we see that they score the amount of rules that they encountered in a given day between a 3 and an 8 over the course of 2 weeks. This variance is missed when measuring overall levels of organizational rules in an aggregated survey item.

Hypothesis testing. Table 2 reports the result of the multi-level fixed-effects regression analysis. The dependent variable is the degree of cognitive uncertainty an employee perceived in a given day and the independent variables are the amount of rules and the rule characteristics.

Table 2. Results of Multi-Level Regression Analysis Predicting Cognitive Uncertainty ($n = 65$ Employees and $n = 270$ Observations).

Variable	Coefficient (unstandardized)	Standard error	t-value	p-value
Intercept	2.803	1.042	2.69	.008
Amount of rules	.403	.102	3.95	.000
Degree to which the rules are written	−.063	.099	0.64	.523
Degree to which the rules are coercive rather than enabling	.126	.096	1.32	.188
Degree to which rules focus on administrative versus service-oriented tasks	.071	.081	0.89	.376
Degree to which the rules are useful	−.000	.103	0.00	.998
Degree to which the rules are consistent	−.171	.086	1.99	.047
R^2 within	.131			
R^2 between	.038			
R^2 overall	.081			
Sigma u	1.749			
Sigma e	2.100			
Rho	.410			
F value	5.00			.000

Hypothesis 1 states that the amount of rules is negatively related to cognitive uncertainty. Contrary to the theoretical expectations, we find that a relatively strong *positive* relationship exists between cognitive uncertainty and the amount of rules the respondent encountered in a given day (coefficient of .403, $p < .001$). This means that the more rules a professional encounters during a given day, the more cognitive uncertainty they experience. This finding contradicts our theoretical expectation that rules in a bureaucratic organization essentially reduce cognitive uncertainty for employees.

In terms of the characteristics of the rule population, we find one statistically significant relationship. Hypothesis 6 states that the degree to which rules are consistent is negatively related to cognitive uncertainty. In the data, we indeed find a significant association between rule consistency and cognitive uncertainty (coefficient of −.171, $p = .047$). For the other rule characteristics—formalization, enabling versus coercive rules, service versus administration-oriented rules, rule usefulness—the analysis does not indicate statistically significant relationships. Hence, hypotheses 2 to 5 are not supported by the data.

Interpretations of the findings. In the following section we rely on the focus groups and on some additional statistical analyses to interpret the results of the statistical analysis. The finding that more rules are associated with higher levels of cognitive uncertainty contradicts the theoretical expectation expressed in hypothesis 1. Based on the focus groups, we find two explanations that may account for this result. First, it is not so much the amount of rules but their characteristics that matter for uncertainty reduction.

The respondents of the focus groups state that rules do not always help them in their work: "Sometimes we get work instructions that are pages long. I try to give feedback on that in my team, because these instructions are not clear. They raise more questions than they provide answers to." This citation suggests that the amount of rules seems to be negatively related to their clarity. More rules may thus lead to less clarity of the set of rules and thus more cognitive uncertainty. In order to test whether more rules are related with more inconsistency in the rules, we tested the interaction effect of the amount of rules and their consistency. We did not find an interaction effect between these variables (coefficient=−.007; p=.830).

A second explanation we observe is related to reversed causality. Although we control for someone's personal disposition of cognitive uncertainty, we may observe that on days on which professionals experience relatively more cognitive uncertainty, they consult more rules in an attempt to reduce this uncertainty. This is illustrated by the following citation: "Especially in difficult situations, I will go look for rules that I can appeal to, for example to not grant a request of a citizen." We observe here that the uncertainty comes first, in the form of a difficult situation. The response of the professional is to look for rules to reduce this uncertainty. In order to test this expectation, we ran the same analysis as presented in Table 2 but with a lag of 1 day for the amount of rules. So, we test the effect of the amount of rules at T-1 on the level of cognitive uncertainty at T. The result of this test is inconclusive. We find a positive effect of the amount of rules at T-1 on cognitive uncertainty (coefficient=.219) indicating that more rules lead to more cognitive uncertainty and not vice versa. However, this effect is no longer significant (p=.194). This may be caused by lower statistical power due to the smaller sample size (we could only include responses that were filled in for at least two consecutive days, which resulted in 133 observations versus 270 observations in the complete data set).

The observation that cognitive uncertainty leads to the consultation of more rules could also indicate that the amount of rules becomes dysfunctional after a certain optimum. Following the premise that organizations by means of rules reduce complex environments to manageable proportions (Meyer, 1985), the rule population could become so complex that, after a certain optimum, bureaucratic complexity again exceeds the limits of bounded rationality (March et al., 2000; Meyer, 1985). This suggests the presence of a non-linear relationship between the amount of rules and cognitive uncertainty. We tested this explanation by using the quadratic term of the number of rules in the multi-level regression equation. This did not result in a statistically significant relationship (coefficient=−.021; p=.523). So, the idea that there is a non-linear relationship between the amount of rules and cognitive uncertainty is not supported by our analysis.

The finding that inconsistent rules contribute to higher levels of cognitive uncertainty is well-reflected in the group discussions with professionals. For instance, respondents mention that the basic principles behind the new way of working in the teams are sometimes inconsistent with legislation protecting the privacy of citizens: "The idea behind the Social Support Act, making a comprehensive assessment of the situation, clashes with the idea of the General Data Protection Regulation, which

makes it almost impossible to administrate this information." In this case, the fact that a professional has to work with these two conflicting principles in legislation causes cognitive uncertainty.

Finally, the focus groups shed light on the hypotheses that did not find statistical support by showing that the effects of rules in practice may be more ambivalent than is expressed in the literature. For instance, we expected that rules that focus on administrative rather than service-oriented tasks do not contribute to uncertainty reduction. However, in the focus groups respondents mention that both types of rules can contribute to the reduction of cognitive uncertainty. In the case of rules that focus on administrative tasks, this is related to the incompleteness of information aspect of cognitive uncertainty. Cognitive uncertainty can be caused by having insufficient information to make a decision and administrative rules assist employees in registering the relevant information to make a decision, as the following quotation shows: "It is very useful to register well, because you cannot remember everything. There are always so many things going on at the same time and if you do not administrate everything in a uniform way, it will become difficult to retrieve this information later on." Similarly, we expected that rules that are coercive rather than enabling do not help in reducing cognitive uncertainty since they only serve the interest of the management. However, respondents have different associations as they mention that: "For me, coercive rules—and then I am thinking of the four eyes principle—help me in my work. Because you need to help each other and you also need to check each other. And then it is good that there are rules for this, because otherwise it would all become very subjective." This quotation shows that these types of rules could also play a role in the reduction of cognitive uncertainty by enabling professionals to share the burden of their uncertainty with another colleague.

Conclusion and Discussion

This study has advanced our knowledge about the characteristics of organizational rules and their association with cognitive uncertainty experiences using a diary study among public professionals working for a large Dutch municipality. The use of a diary study enabled us to find that the within-person experiences of rules and cognitive uncertainty are highly variable over time. With regard to our hypotheses, we find that, contrary to our expectations, the amount of rules a professional encounters during a given day is positively correlated with the amount of cognitive uncertainty they experienced. In other words, more rules are associated with higher levels of cognitive uncertainty. Possible explanations for these findings include the fact that not the amount of rules but the characteristics of the rules matter for uncertainty reduction, and reversed causality—professionals in an uncertain situation consult many rules in an attempt to reduce their uncertainty. From an HRM-perspective, this indicates that more rules are likely not an effective way of managing cognitive uncertainty of employees. Rather, managers should look into the characteristics of rules to manage employees' uncertainty experiences.

With regard to the rule characteristics, we find that consistent rules are associated with lower levels of cognitive uncertainty. This is in line with our theoretical

expectation that inconsistent rules lead to cognitive uncertainty concerning which rule or set of rules takes priority over the other. With regard to the other rule characteristics, we did not find statistically significant associations between cognitive uncertainty and the degree to which rules are written; the degree to which rules are enabling instead of coercive; the degree to which rules are focused on administrative tasks instead of on service-oriented tasks; and the degree to which rules are useful. The findings have implications for both research and practice.

First, the use of a within-person design is important for future research on organizational rules. Our study shows that between 64% and 76% of the variance in both the amount of rules and the characteristics of rules that employees experience is within-person. Research on organizational rules and red tape currently relies heavily on (cross-sectional) survey data that is not sensitive to such variation and thus only provides an incomplete picture of organizational rules at best. The non-significant findings should therefore be considered in light of this novel methodology. Theorizing has so far been based on a static perspective on rules and cognitive uncertainty. The non-significant findings may then be caused by limitations of the study design, for instance because the low sample size and nested data structure may overemphasize individual outliers. They could also be the result of a strength of the design, though, since this method allows us to much more precisely examine the relationships between rule characteristics and cognitive uncertainty. Also, our findings show that more research using real-time measurements of respondents is strongly recommended in order to gain a more dynamic and nuanced view of organizational rules and their effects. The dynamic nature of organizational rule experiences cannot be a mere footnote in future public administration and human resource management research on bureaucracy, red tape, and administrative burden. This finding has implications for practitioners as well: studying the daily dynamics of organizational rules and uncertainty experiences of employees allows managers to gain a more fine-grained understanding of rules and red tape in the organization and its impact on employees, which could be at the base of a discussing with employees on how the rules in the organization may be improved.

Second, the use of cognitive uncertainty reduction as a theoretical lens offers a distinct perspective to study the effects of organizational rules as opposed to motivational theories. For instance, where rules that focus on administrative work tasks have negative motivational effects (Frey & Jegen, 2001), from a perspective of uncertainty reduction a more nuanced evaluation of this type of rules seems appropriate. The findings of the focus groups suggest that this type of rules could also make a positive contribution to an individual's work experience by reducing their uncertainty with regard to incomplete information. Similarly, where coercive rules are generally viewed as only serving the interest of managers (Pedersen and Ejersbo, 2019), when viewed from the perspective of uncertainty reduction we see in our focus groups that they can also be beneficial for professionals. For people managers, this finding is important since it shows that rules that are thought of as only serving the interest of management and administration may also positively contribute to the work experience of employees. Future research could test separate hypotheses for these rule characteristics (service-oriented vs. administration-oriented, coercive vs.

enabling) since they do not seem to be as diametrically opposed as was hypothesized in this study. Alternatively, the rule characteristics may also be viewed as reflecting higher order constructs, such as red tape and green tape. Future research could also test the effects of these higher order constructs of red and green tape on employees' experiences of uncertainty and thereby contribute to our understanding of the cognitive effects of rules in public organizations.

Third, our research was based on the premise that organizational rules in essence reduce cognitive uncertainty. However, we find that more rules are associated with higher levels of cognitive uncertainty, which could be explained by the number of rules becoming dysfunctional after a certain optimum (March et al., 2000). From the perspective of bounded rationality (Meyer, 1985; Simon, 1970) we could not only expect that too few rules contribute to uncertainty, but also that too many rules induce cognitive overload and thus leads to cognitive uncertainty. Similarly, the need to consult many rules in order to find a solution creates high learning costs for employees (Moynihan et al., 2015). By looking at the individual dynamics of rules, our study complements research in the field of organization science, which shows that too many rules have negative consequences from an organizational point of view (e.g., March et al., 2000). Our study shows that too many rules can also be seen as a pathology from the perspective of the individual employee. For managers this means that it is important to strike a balance between too few and to many rules in managing cognitive uncertainty for employees. In the present article, we focused on cognitive uncertainty caused by incomplete, unclear or conflicting information. Future research could focus on the contrasting cognitive mechanism of information overload and see to what extent and how too much rules can contribute to more uncertainty, even if the rules are clear and consistent. Furthermore, future research could aim to establish whether there is indeed an optimum amount of rules after which more rules become dysfunctional.

Fourth, we find that it is important to look at rule characteristics instead of degrees of formalization (cf. DeHart-Davis et al., 2014). The focus groups show that the effect of most rule characteristics on cognitive uncertainty is ambivalent. For instance, both enabling and coercive rules could play a role in uncertainty reduction. This picture is more nuanced than what we expected based on theory. Moreover, both the diary study and the focus groups find that inconsistent rules are associated with higher levels of cognitive uncertainty. This finding is consistent with previous research (Kaufman, 1977) and inconsistent rules seem to be inherent to working in the public sector, given its complex tasks and often competing values (Hood, 1991). An interesting avenue for future research is then to study how professionals can work effectively given these tensions. For instance, the team context in which the professionals work, offers a starting point to study how uncertainty that arises from these inconsistencies can be reduced by sharing dilemmas caused by inconsistent rules within the team. This may have implications for practice as well, where managers can play a role not only in reducing inconsistencies between rules but also in enabling professionals to effectively cope with these inconsistencies.

We must keep in mind a number of limitations of this study. First, the present study offers a dynamic perspective on organizational rules, but it does not enable us to draw

conclusions on causality. For instance, the focus groups indicate that the causal direction of the positive relationship between the amount of rules and cognitive uncertainty might be reversed. Running an additional analysis with a lagged variable for the amount of rules provided inconclusive results. Future research with multiple measurement points per day could solve this issue. For instance, by measuring the amount of rules an employee encounters in the morning and their level of uncertainty in the afternoon, future research could establish whether more rules lead to more uncertainty or vice versa.

Second, the finding that inconsistent rules contribute to uncertainty may in part be due to the conceptualization, since we conceptualize cognitive uncertainty as "experiences of incomplete unclear or conflicting information in the professional's work." The use of the term "conflicting" resembles the use of "consistent" in the formulation of one independent variable.

Third, while this study is characterized by high levels of internal validity and ecological validity, its generalizability is limited due to the professionalized bureaucratic context and the ongoing reform within the teams. Future research in, for instance, a more classical bureaucratic environment could shed further light on the generalizability of the findings. Similarly, replication in different national contexts may add valuable insights on the generalizability of our findings. The Dutch administrative culture is characterized as traditionally legalistic but less so after the Second World War (Pollitt & Bouckaert, 2011, p. 63). Both research in more legalistic (e.g., Germany) and less legalistic (e.g., Southern European) countries could thus be valuable. Moreover, future research could look at cross-level interactions between personal characteristics and rules. For instance, one could expect that the effect of rules on uncertainty experiences differs between highly professionalized employees as opposed to employees who are used to standardized work.

In conclusion, in this study we have used a novel theoretical and methodological approach to research the pathological effects of organizational rules by highlighting cognitive uncertainty reduction as an alternative mechanism that accounts for these effects. Cognitive uncertainty reduction is a valuable outcome from both an organizational and a HRM perspective, since it is associated with providing consistency in the work and preventing negative employee outcomes such as work stress and absenteeism. Our data shows that a daily diary study is a valuable way of gaining insight into the variance of rule experiences across days. Diary studies are sensitive to such variation and thus enable us to connect rule characteristics and uncertainty experiences. Our findings show support for the theoretical arguments that research into rule characteristics and cognitive uncertainty strengthens our understanding of the way in which rules function in organizations.

Appendix 1

Items Per Hypothesis Included in the Online Daily Diary

Dependent variable. To what extent did you encounter difficult situations in your work today, as a consequence of a lack of information, unclear or conflicting information?
1 = no difficult situations   -   10 = many difficult situations

Independent variables. H1: How many rules have you encountered in your work today?

1 = no rules   -   10 = many rules

H2: To what extent were the rules you encountered today written?

1 = all rules were unwritten rules   -   10 = all rules were written rules

H3: Did you perceive the rules you encountered today more as enabling or more as coercive?

1 = completely enabling   -   10 = completely coercive

H4: Did you perceive the rules you encountered today more as focusing on service-oriented tasks or more as focusing on administrative tasks?

1 = completely focusing on service-oriented tasks   - 10 = completely focusing on administrative tasks

H5: Did you perceive the rules you encountered today as useful for your work?

1 = not at all usefull   -   10 = very useful

H6: Did you perceive the rules you encountered today as consistent?

1 = not at all consistent   -   10 = very consistent

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