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HRM autonomy, integration and performance in government agencies: tests of necessity and sufficiency

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ABSTRACT
The relationship between HRM autonomy, business-like HRM, and performance in government agencies has been of interest in research for decades now. Using survey data from 365 respondents working in Dutch government agencies, we studied to what degree HRM autonomy is a necessary and sufficient condition for HRM integration, distinguished between vertical and organizational integration, and, consequently, HRM performance in agencies. The findings from structural equation modelling and necessary condition analysis show that HRM autonomy is necessary but not sufficient for HRM integration, while HRM integration is necessary and partly sufficient for HRM performance.

KEYWORDS HRM autonomy; HRM integration; HRM performance; necessary condition analysis; structural equation modelling

One of the most pressing questions in public administration involving agencification – i.e., the creation of government organizations that operate (semi-)autonomously under public law – has been that of how managerial autonomy relates to performance (Verhoest et al. 2010). The rhetoric of New Public Management-inspired reforms has been that the use of agencies brings higher performance, and that managerial autonomy within those agencies would for the same reason lead to higher performance in government agencies. An often-stated argument for this positive effect is that managerial autonomy allows organizations to adopt and implement certain management practices that were found to be beneficial in the private sector (Blom 2021). Since public management often incurs some inefficiency due to limited competition within the public sector, such private sector influence was argued to be potentially helpful for performance also in public agencies. Recent findings from longitudinal data do indeed suggest that managerial autonomy can lead to higher performance under certain conditions (Bjørnholt, Boye, and Mikkelsen 2022).

One of the areas in which considerable effects from the adoption of business-like practices were expected is human resource management (HRM). The private sector came to be seen by policy makers as the prime example on how to manage people effectively.

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Providing agencies a certain degree of HRM autonomy was seen as instrumental in adopting a business-like approach to HRM (Verhoest, Van Thiel, and De Vadder 2021). However, public sector performance is about more than effectiveness and efficiency (e.g. Andrews and Van de Walle 2013; de Bruijn and Dicke 2006), and so private sector innovations can also prove harmful or ineffective (Egeberg and Trondal 2009).

In this respect, several studies that have investigated the HRM autonomy-performance link have demonstrated mixed results. For example, Verhoest, Verschuere, and Bouckaert (2007) found that managerial autonomy, especially concerning decisions of HRM, has a positive influence on innovative behaviour. Voorn, Borst, and Blom (2020) find that HRM autonomy itself does not bring about performance gains, but that governance towards increasing the use of business techniques is required for a positive HRM autonomy-performance link. More critically, Kim and Cho (2014) find that HRM autonomy actually has a negative effect on performance in Korean agencies.

Despite these studies on HRM autonomy and various performance outcomes, two important lacunas remain. First of all, although championed by NPM-proponents, only a few empirical studies have actually tested whether HRM autonomy allows organizations to adopt business-like practices and, hence, can achieve higher performance (for an example, see Voorn, Borst, and Blom 2020). This may be due to the ambiguous nature of the term business-like, as it can refer to numerous concepts (Teo 2000). The lack of this type of research is also striking given the theoretical arguments that autonomy can even lead to lower performance due to opportunistic behaviour (Kim and Cho 2014). Second, there is a discrepancy between rhetoric and research in the way autonomy is related to business-like practices and performance. While the rhetoric contains that HRM autonomy is necessary for achieving high performance as it enables agencies to take a business-like approach, research has tested this relation primarily from a sufficiency point of view. That is, HRM autonomy is sufficient for the adoption of business-like practices and high performance.

The aim of this study is to address these two lacunas. First, we investigate the links between HRM autonomy, which is identified as one of the three types of managerial autonomy, HRM integration, and HRM performance. HRM integration is seen as an appropriate concept representing business-like HRM, as a high degree of integration of HRM in the organization is argued to originate from businesses and gradually became an aim in the public sector as well (Guest and Peccei 1994; Järvalt and Randma-Liiv 2010; Brown 2004; Storey 1989; Truss 2008). The study also addresses the second lacuna by using a combination of necessary condition analyses (NCA) and structural equation modelling (SEM) to test for necessity and sufficiency in the autonomy-performance link (Richter et al. 2020). The goal of this study is to answer the following research question: *To what degree is HRM autonomy a necessary and/or sufficient condition for HRM integration and, consequently, HRM performance in government agencies?*

The remainder of the article is structured as follows. First, we describe and conceptualize HRM autonomy, HRM integration, HRM performance and the relation between these concepts. This will lead to the development of our hypotheses. Second, we explain the methodology used to test the hypotheses. Next, the results are described, followed by a discussion of the implications for research and practice.

Theory

HRM autonomy in HRM architecture

The study of (the effects of) autonomy in organizations has a strong tradition in the public management literature. Much has been written about the many different forms that autonomy can take (e.g. Verhoest et al. 2004) and how these dimensions influence organizational performance (e.g. Schwab, Bouckaert, and Kuhlmann 2017).

Verhoest et al. (2004) distinguish between six types of autonomy that can affect an organization's discretion and subsequently their performance. In their conceptualization, *legal autonomy* refers to the protections of the discretion of organizations offered by the law, while *structural autonomy* refers to the extent to which the control of organizations is separated from their ownership. *Financial autonomy* refers to the diversity of funding organizations have, and *interventional autonomy* refers to the absence of performance management. Finally, *policy autonomy* refers to the discretion an organization has to make decisions about production, processes and procedures, instruments, and target groups, while *managerial autonomy* refers more specifically to the discretion granted to managers in aspects of management (Verhoest et al. 2004).

Our focus in this article is on the autonomy of organizations in HRM matters, a type of managerial autonomy that determines the discretion that agencies possess in designing their work processes (Christensen and Laegreid 2006; Van Thiel and Yesilkagit 2011; Verhoest et al. 2012). HRM autonomy consists of the control over all kinds of 'HRM matters' (Voorn, Borst, and Blom 2020). However, HRM is more than these HR practices as behind the HR practices lies organization's HRM philosophies and systems which together with the HR practices are reflective of the HRM choices made by semi-autonomous agencies (Blom et al. 2019).

HRM philosophies, systems, and practices have been positioned as essential and successive components of the HRM architecture which are respectively defined as the guiding principles (that high-positioned managers try to pursue), the overall programs, and the instruments to manage the workforce (Riaz, Townsend, and Woods 2020; Blom et al. 2019). Within these three components, agencies might make different choices. Borst and Blom (2021) argue that organizations can adopt an accumulation philosophy, which emphasizes maximum involvement and long-term career development, a facilitation philosophy, which emphasizes the facilitation of self-motivated employees, or a utilization philosophy, focusing on technical skills and high efficiency. Furthermore, regarding systems, previous studies have identified various types, including high-commitment work systems (HCWS), high-involvement work systems (HIWS), and high-performance work systems (HPWS). Lastly, organization might adopt practices that are predominantly related to HCWS and HIWS to promote employee participation, trust, and collaboration, or practices that are predominantly related to HPWS to foster predictability and control. These practices have commonly been distinguished between those that are ability-enhancing, those that are motivation-enhancing, and those that are opportunity-enhancing (Lepak et al. 2006).

Which HRM philosophies, systems and practices agencies choose varies as the external contexts that pressure these agencies differ but also the amount of HRM autonomy differs (Blom et al. 2019). Indeed, it is often argued that public organizations want to be a model employer and therefore predominantly choose for a 'soft' HR architecture aimed at treating employees as valued assets with a 'soft' philosophy (i.e. accumulation or utilization philosophy), policy (i.e. HCWS of HIWS), and cluster of practices, in contrast to a 'hard' HR architecture aimed at rationally treating employees as resources that need to be used to reach performance with a hard philosophy, policy, and cluster of practices (Borst and Blom 2021). Not unlike central governmental organizations, agencies are also exposed to the relative strictness of public sector ('soft') HRM rules (Voorn, Borst, and Blom 2020), but they also experience considerable HRM autonomy in their choices regarding HRM philosophies and policies as a result of managerialism (James and Van Thiel 2011; Rodwell and Teo 2008; Truss 2008). Consequently, public organizations might for example pressure agencies to adopt certain soft policies but the agency is free to choose a hard philosophy (Blom et al. 2019). Moreover, HRM policies and its resulting HRM practices might be understood idiosyncratically between employees due to mixed messages of line managers although the policy is equal across employees (Townsend et al. 2012).

HRM autonomy and HRM integration

In this article, we investigate the links between HRM autonomy, HRM integration, and HRM performance. While HRM integration can refer to policy and functional integration, Guest and Peccei (1994) found that vertical and organizational HRM integration in particular are most important for the performance of the HRM department, and the focus of this study will therefore be on these two types.

Vertical HRM integration links HRM policies and practices with business strategies (Guest and Peccei 1994; Storey 1989). As one of the traditional roles of HRM is that of 'strategic partner' (Ulrich 1997), more vertical integration of HRM means more alignment between the organizational strategy and the HRM strategy (Wood 1999). Organizational integration is defined as the integration between the HRM department and other departments (Wood 1999). It is mostly focused on the way the needs of the other departments are met, which, according to scholars, is best achieved when the HRM department is integrated with other departments (Green et al. 2006). As previously described, we expect a positive relationship between both types of HRM integration and performance, but a core question of public administration is what can bring about this kind of integration.

One core driver of HRM integration, especially in the context of public sector organizations, is HRM autonomy. Up until the 1980s, in the 'classic' bureaucratic model of public administration, public bureaucracies used a top-down and centralized approach, with limited HRM autonomy, and as a result, the HRM practices and policies of public sector organizations were uniform and not tailored to the organization (cf. Brown 2004). In such classic bureaucratic public sector organizations, the top-down and centralized approach can be seen as a form of 'red tape', constraining the development and adoption of organizational practices (Blom, Borst, and Voorn 2020). In other words, in the traditional public sector, top-down and rule-based organization set boundaries for both vertical and organizational HRM integration.

Since the 1980s, first in the form of New Public Management (Dunleavy and Hood 1994) and later in the form of New Public Governance (Pestoff, Brandsen, and Verschuere 2012), concerns about the inefficiency of the traditional public administration slowly started challenging this top-down and rules-based approach. After first experimenting with privatization and contracting-out, with mixed successes, the trend of the past decades seems to have been one towards agencification (the development of agencies) and corporatization (the development of state-owned enterprises) in the public sector (Verhoest et al. 2010; Voorn, van Thiel, and van Genugten 2018). A common trend in both corporatization and agencification is that they retain public ownership, thereby preserving some public values that may be lost under privatization, while at the same time devolving much autonomy to public sector organizations. A core reason for constituting such public sector organizations 'at arm's length' appears to be that the autonomy of such organizations removes much red tape in these organizations, which allows a more tailored and business-like approach to HRM (akin to the private sector).

As a high degree of integration of HRM in the organization is argued to originate from businesses and gradually became an aim in the public sector as well (Brown 2004; Järvalt and Randma-Liiv 2010; Truss 2008), it is expected that this HRM autonomy is necessary for and would lead to more HRM integration, both in the form of vertical integration and organizational integration. This mechanism can be explained from strategic HRM literature (Boon 2008), which argues that fit between HRM and the organization is dependent on the degree to which the organization has control over decision-making. All public and private sector organizations are influenced by external pressures in their HRM approach, but most organizations also have the power to mitigate these pressures to make strategic choices that allows them to achieve fit between HRM and the organization (Paauwe 2004). If an organization lacks this power, which seems true for public organizations in a top-down, rules-based and centralized system, it becomes near impossible to achieve successful HRM integration. Not only does this system impedes an organization's power to mitigate external pressures, it is also an external pressure itself as it imposes how organizations within this system should approach HRM. Previous findings corroborate this notion, showing that increased autonomy has been associated with increased use of strategic HRM (Blom et al. 2021; Teo 2000). Thus, we expect HRM integration to be the natural outcome of organizational development in the absence of red tape – and HRM autonomy can be perceived as exactly that lack of red tape. For individual organizations, HRM autonomy is thus necessary for HRM integration; moreover, it is expected that more autonomy leads to stronger integration.

H1: *HRM autonomy is necessary for vertical HRM integration (a) and more autonomy is related to stronger vertical integration (b).*

H2: *HRM autonomy is necessary for organizational HRM integration (a) and more autonomy is related to stronger organization integration (b).*

HRM integration and HRM performance

In HRM literature, HRM integration has been argued to be an important antecedent to HRM performance. There are multiple ways in which research has defined and measured HRM performance. According to Guest and Peccei (1994), a main distinction can be made between objective and subjective performance. Objective performance relates to the use of workforce- or organization-related measures, such as turnover, absenteeism or even productivity, as proxies for how the HRM department is performing. Although they are attractive measures to use, they are also difficult to measure or estimate uniformly across departments and over time and are for a large part outside of the reach of the HRM department. Subjective performance, in contrast, focuses on subjective judgements instead (Guest and Peccei 1994). This approach acknowledges that the perception of the HRM department's performance is specific to the individual and is largely based on one's interpretation of how the department operates (Tsui 1990).

Depending on the perspective of the researcher and the outcome of interest, one can vary in who are used as informants. For example, if one is more interested in what is best for the organization as a whole, surveying top management is most appropriate (Wright et al. 1998). Similarly, if one is interested in team-related aspects, surveying middle and line management makes more sense. In this study, the focus is on how employees perceive HRM performance, based on the notion that it is this perception, and not necessarily the objective performance, that is related to employee attitudes and behaviours (Guest and Conway 2011). In line with previous studies, we, therefore, adopt the subjective approach in this study with the employee as informant (Edgar and Geare 2014; Gibb 2001).

Research on the importance of the HRM integration for HRM performance has emphasized two mechanisms: one in which integration *can* lead to higher performance and one in which the integration is *needed* for achieving high performance. The first mechanism is practically the only one that has been tested empirically. In contrast, the second mechanism is mentioned in a theoretical sense only.

In many studies, the first mechanism is formulated quite explicitly. For example, Teo and Crawford (2005) argue that 'the level of strategic HRM effectiveness is influenced by the strategic role played by the senior HRM practitioner in the strategic management' (10). Similarly, Wang and Shyu (2008) confirmed their hypothesis that a better fit between the organizational and HRM strategy increases HRM performance. These statements include the notion that more HRM integration leads to higher HRM performance. The second mechanism is formulated less often and less explicit, but some scholars have done so. For example, Dany, Guedri, and Hatt (2008) argue that 'HRM integration is a necessary but not sufficient condition for HRM [to positively] impact organizational performance' (2095).

An important concept that might explain why vertical and organizational integration are related to HRM performance is ownership (Guest and Peccei 1994). Ownership, or a sense of ownership, of the HRM department in the strategy-making process plays a key role in achieving HRM performance. The role of ownership can be viewed from two perspectives: from the owner itself (in this case the HRM department) and from the perceptions of others in the organization (i.e. employees). From the perspective of the owner, ownership of the HRM department in (parts of) the strategy-making process allows it to add value to the organization (Teo and Crawford 2005). Following Ulrich (1997), the HRM department has different roles in the organization and, traditionally, each one has the potential to add value to the organization. For the HRM department to fulfill the strategic partner role successfully, which becomes visible in the level of vertical and organizational integration, ownership in the strategy-making process is crucial. If they are involved in this process, its ability to add value increases. Moreover, in light of the increased importance of the strategic partner role (e.g. Poloski-Vokic 2016; Thoman and Lloyd 2018), whether it is due to the rise of strategic HRM in public organizations or the development of other HR roles to line management, one could even argue that fulfiling the strategic partner role has become necessary for the HRM department to perform well.

From the perspective of the employee, visibility of the actions and decisions taken by the HRM department are essential to achieve high HRM performance. A visible HRM department helps employees to see the added value of HRM to the organization (Bowen and Ostroff 2004), which, in turn, leads to positive perceptions among employees. In this respect, previous research has shown that employees expect the HRM department to be integrated vertically and organizationally and that, if these expectations are met, the performance of the HRM department is perceived as higher.

In sum, based on the literature, one can argue that HRM integration, both vertically and organizationally, is a necessary and sufficient condition to high HRM effectiveness. It not only enables the HRM department to add value to the organization through their impact on the organizational strategy and their interaction with other departments, but it also helps to show to employees that the department has an important role to play. Given these arguments, the following hypotheses are formulated.

H3: *Vertical HRM integration is necessary for HRM performance (a) and stronger vertical integration is related to higher performance (b).*

H4: *Organizational HRM integration is necessary for HRM performance (a) and stronger organizational integration is related to higher performance (b).*

Method

Research context and sample

Data were collected in 2019 from a sample of employees working in Dutch government agencies. These agencies operate at arm's length of central government and are primarily responsible for public service delivery. To test our hypotheses, we needed a case in which variance in the levels of HRM autonomy, integration and performance are expected to be found. The Netherlands provided such a relevant case, as it has adopted those NPM-reforms in which government agencies were given varying degrees of managerial autonomy (Van Thiel 2012). In addition, these agencies have been found to vary in their approach to HRM (Blom et al. 2019). The data collection was part of a larger research project on HRM in public sector organizations. The respondents voluntarily registered for a panel (*Flitspanel*) set up in 2006 by the Ministry of Internal Affairs with the goal to get swift and well-founded answers to policy and research questions.

A questionnaire was sent to 1,501 people working at either an *Agentschap*, which is an agency without legal independence, or a *Zelfstandig Bestuursorgaan* (ZBO), which is an agency with legal independence (Yesilkagit and Van Thiel 2012). After one week, a reminder for participation was sent. In total, 365 respondents (pre-reminder: 252 and post-reminder: 113) filled out the questionnaire (response rate: 24.3%), which is fairly similar to other studies using this panel (de Graaf, Huberts, and Strüwer 2018). See Table 1 for an overview of the characteristics of the respondents. The average age of the participants was 54.6 years (SD = 8.0), the majority of the respondents were male (73%), had a higher education degree (77.3%), and worked at an agency without legal independence (75.3%). Compared to other studies using a sample of agency employees (Blom 2020; Blom et al. 2020), our sample is similar in terms of educational

Table 1. Sample characteristics.

Age (in years)	54.6
Male (%)	73
Education (%)	
Low	2.2
Middle	20.5
High	77.3
Tenure (in years)	27.7
Domain (%)	
Executive	8.5
Advice	21.6
Research	9
Policy execution	28.2
Support	14.8
Managerial position (%)	22.6
Agency type without legal independence (%)	75.3
Organizational size (in fte)	11.070

level and distribution between people working at an agency with versus without legal independence but has a higher average age and percentage of males. A comparison between early responders (i.e. pre-reminder) and late responders (i.e. post-reminder) did not reveal significant differences in demographics and our main variables of interest.

Our sample consisted of agency employees working in a range of different domains and positions. We mentioned earlier that we adopt the subjective approach as the performance of the HRM department is specific to the individual and based on the interpretation of how the HRM department operates. However, we also acknowledge that there may be differences in how familiar employees are with the four main concepts in their organization, particularly between managers and nonmanagers. Comparisons between the scores of managers and nonmanagers did not show significant differences ($p > 0.05$), although managers are trending towards higher scores for HRM integration. In addition, there are virtually no differences between the correlations and partial correlations after controlling for managerial position for HRM autonomy, integration and performance ($r_{difference} < 0.01$). Finally, to check whether managers and nonmanagers interpret the concepts similarly, we performed multigroup confirmatory factor analyses for three hierarchical measurement models that included (i) no constraints, (ii) constrained factor loadings across the manager and nonmanager groups, and (iii) constrained factor loadings and intercepts across the manager and nonmanager groups (Davidov et al. 2014). Following the recommended guidelines that the fit indices CFI and RMSEA do not differ more than –0.005 and 0.01 respectively between the models (Chen 2007), the results of the analyses showed that managers and nonmanagers have a shared understanding of the four main concepts.

Measures

HRM Performance

Four items were used to measure HRM performance, based on the measures of Tsui (1990) and Wright et al. (1998). This measure is appropriate for this study's purpose, as it focuses on how the HRM department performs according to its internal customers (e.g. To what extent do you feel your HRM department is performing its job the way you would like it to be performed?) (*CR* = 0.88). All items were measured on a 5-point Likert scale ranging from *not at all* to *totally*. The intraclass correlation (ICC) revealed that most of the variance is likely to be attributable to the individual and not the organizational level (5.8%).

Vertical Integration

Three items were used to measure vertical integration, derived from Green et al. (2006). These items referred to integration of the HRM department in the strategy-making process (e.g. 'This HRM department has been fully integrated into the strategic planning process') (*CR* = 0.80). All items were measured on a 5-point Likert scale ranging from *completely disagree* to *completely agree*. The ICC indicates that most of the variance is likely to be attributable to the individual and not the organizational level (<1%).

Organizational integration

Three items were used to measure organizational integration, derived from Green et al. (2006). The items refer to integration of the HRM department with other departments (e.g. 'This HRM unit regularly checks with other units to identify organizational training needs') (CR = 0.85). All items were measured on a 5-point Likert scale ranging from *completely disagree* to *completely agree*. The ICC revealed that most of the variance is likely to be attributable to the individual and not the organizational level (2.3%).

HRM autonomy

We developed a measure with five items for HRM autonomy based on the three essential and successive components described earlier – HRM philosophy, system, and practices – that make up the HRM architecture of an organization (Riaz, Townsend, and Woods 2020). As shown in previous research, autonomy in one component does not necessarily mean autonomy in the others as well (Blom et al. 2021). Therefore, HRM autonomy as a construct should include separate indicators that reflect autonomy in each component, and a gradual score rather than a dichotomy better reflects how organizations can experience HRM autonomy. To achieve this, we asked people the degree to which they perceived their organization had autonomy in designing the HRM philosophy, the HRM system and the HRM practices (*CR* = 0.90). To reflect the differences in the goals on the practice-level, the HRM practices were further distinguished in ability-, motivation-, and opportunity-enhancing practices (Lepak et al. 2006). The ICC revealed that most of the variance is likely to be attributable to the individual and not the organizational level (13.3%).

Control variables

In line with previous literature, several individual- and organizational-level control variables were included (Bach 2014; Bednall, Sanders, and Runhaar 2014; Hauff, Alewell, and Hansen 2017). On the individual level, gender, age, education, and tenure were included. Education included nine categories, ranging from primary education to doctoral degree, and was treated as a continuous variable. Tenure represented the number of years the respondent worked at his/her organization.

On the organizational level, we included a dummy variable indicating whether the organization where the respondent was working in had legal independence or not. This variable reflects the degree of formal autonomy an organization has. Based on the literature (Bach 2014), it is expected that legal independence directly influences HRM autonomy but not HRM performance and integration. As Wu-Hausman tests indicated endogeneity in the HRM autonomy-performance link, this variable acted as an instrumental variable correcting for endogeneity. Furthermore, it lowered the ICC of HRM autonomy (from 13.3% to 7.2%), meaning that the residual variance of HRM autonomy is even more likely to be attributable to the individual level. Finally, we included organizational size (in full-time equivalents) as a control variable as well. Data on legal independence and size were collected from the website managed by the Ministry of Finance that contains information on the public finances of the Netherlands, and from the annual reports of the agencies themselves. We used data from 2018, as it was the most recent year from which complete information was available.

Analytical procedure

To test the hypotheses, several analytical steps have been taken. As this study's aim is to test both necessity and sufficiency hypotheses, different analytical techniques were needed. To test hypotheses with a necessity logic, necessary condition analysis was conducted (NCA; Dul 2016b). While relatively novel and unknown in public administration research, HRM scholars have recently argued for its use besides more conventional techniques (Hauff et al. 2019). NCA is an appropriate technique to test hypotheses that contain a necessity statement as it identifies the level of a necessary condition that needs to be achieved in order for the outcome to reach a desired level. It does so by analysing scatter plots between independent and dependent variables and determining a ceiling line on top of the data points. The ceiling line can be determined in different ways, although the so-called ceiling envelopment-free disposal hull (CE-FDH) line is currently recommended. This line is a non-decreasing step-wise linear line and separates the space with data points from the space without data points (Richter et al. 2020). In addition, bottleneck tables are calculated which present the ceiling line in tabular form. Based on how large the empty space is and how accurate it is estimated, one can determine if an independent variable puts a significant constraint on (i.e. is a necessary condition for) a dependent variable. This is done using the effect size *d*, which reflects how large the space is without data points (i.e. the ceiling zone) compared to the total space (i.e. the scope) and is, by definition, between 0 and 1. To evaluate the significance of *d*, a cut-off criterium of 0.1 is used in combination with a significance test.

To test hypothesis with a sufficiency logic, structural equation modelling was used (SEM). SEM is a collection of statistical methods that allow the relations between one or more independent and dependent observed and latent variables to be analysed while partially controlling measurement error (Kline 2010).

As no analytical technique and software currently exists that integrates NCA with SEM, this study followed guidelines from Richter et al. (2020) to combine these two techniques. First, SEM analyses were conducted to estimate latent variable scores and structural relationships. To do so, a two-step approach was conducted, where the measurement model without the regression paths was tested in the first step and the structural model with regression paths was tested in the second step (Anderson and Gerbing 1988). To test the measurement model, a confirmatory factor analysis with a robust maximum likelihood (MLR) estimator was conducted. The MLR estimator corrects for skewness and non-normality of the parameters and items (Kline 2010). The comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) were the three fit indices used to assess fit of the data. CFI and TLI values above .90 are indicative of adequate fit and above .95 of excellent fit. RMSEA and SRMR values below .08 are indicative of adequate fit and below .05 of excellent fit (Hu and Bentler 1999). If at least adequate fit was achieved for the measurement model, the latent variable scores were exported to use in the NCA and the structural model with a robust MLR estimator was estimated. To allow the instrumental variable (legal independence) to correct for endogeneity in the structural model, the error terms of the constructs were allowed to correlate. The estimates from the structural model were used to test hypotheses 1b, 2b, 3b, and 4b. The analyses were conducted using the *lavaan* package in R (Rosseel 2012).

Second, the NCA was performed with HRM strength, vertical and organizational integration as independent variables and HRM performance as dependent variable. As NCA currently cannot include latent variables in the same way as SEM does, latent variable scores need to be used if one wants to include latent concepts (Richter et al. 2020). Therefore, the latent variable scores exported from the SEM analyses were used to perform the NCA. The bottleneck tables and the *d* effect sizes were used to test hypotheses 1a, 2a, 3a, and 4a. The analyses were conducted using the *NCA* package in R (Dul 2016a).

Results

Evaluation of measurement model

The first step was to evaluate the measurement model from the SEM analyses. The measurement model contained the latent variables HRM performance, vertical HRM integration, organizational HRM integration, and HRM autonomy. The model was estimated using a robust MLR estimator and the results showed an acceptable model fit (CFI = 0.96; TLI = 0.94; RMSEA = 0.07; SRMR = 0.05). The average variance extracted for all latent variables exceeded 0.50, indicating convergent validity (Fornell and Larcker 1981). Following recent guidelines (Rönkkö and Cho 2022), the correlations between the latent variables showed no major issues relating to discriminant validity, although the high correlation between vertical and organizational integration can be seen as a ‘marginal problem’. We decided to retain the two constructs based on the theory and the fact that an alternative model in which the two constructs were combined into a single integration construct showed significantly worse fit ($\Delta\ \chi^2$ = 10.62, $p = 0.01$). Given the acceptable model fit of the measurement model, the latent variable scores were calculated and exported to the NCA.

Given the fact that the data comes from a single source, common-method variance (CMV) may be an issue, although the inclusion of multiple independent variables lessens the issue (Siemsen, Roth, and Oliveira 2010). In addition, a Harman’s single factor test was performed in which all items loaded onto one factor. While criticized, this test can be used to indicate the possible presence of CMV (George and Pandey

2017). This model had a significantly worse fit compared to the measurement model (CFI = .58; TLI = .51; RMSEA = .21; SRMR = 0.19).

Results from necessary condition analysis

Using the latent variable scores from the measurement model of the SEM analysis, a NCA was conducted to assess the necessity of HRM autonomy for vertical and organizational HRM integration. In addition, the necessity of vertical and organizational HRM integration for HRM performance was tested as well. Figure 1 presents the scatter plots for the relationships, and it shows that for all independent variables, considerable empty area in the upper left corner exists. The results in Tables 2 and 3 further indicate that HRM autonomy is a meaningful and significant necessary condition for HRM integration. In addition, vertical and organizational HRM integration are meaningful and significant necessary conditions for HRM performance. Therefore, hypotheses 1a, 2a, 3a, and 4a are supported by the data.

Table 4, which shows the values for the bottleneck tables expressed in percentages of the observed range, provide more information on the level and direction of the necessary conditions. The bottleneck tables with vertical and organizational HRM integration indicate that HRM autonomy may not be necessary until average levels of integration, but that its necessity quickly rises when high levels are achieved. For example, for a level of 80% of HRM integration a minimum level of 50% for HRM autonomy is needed.

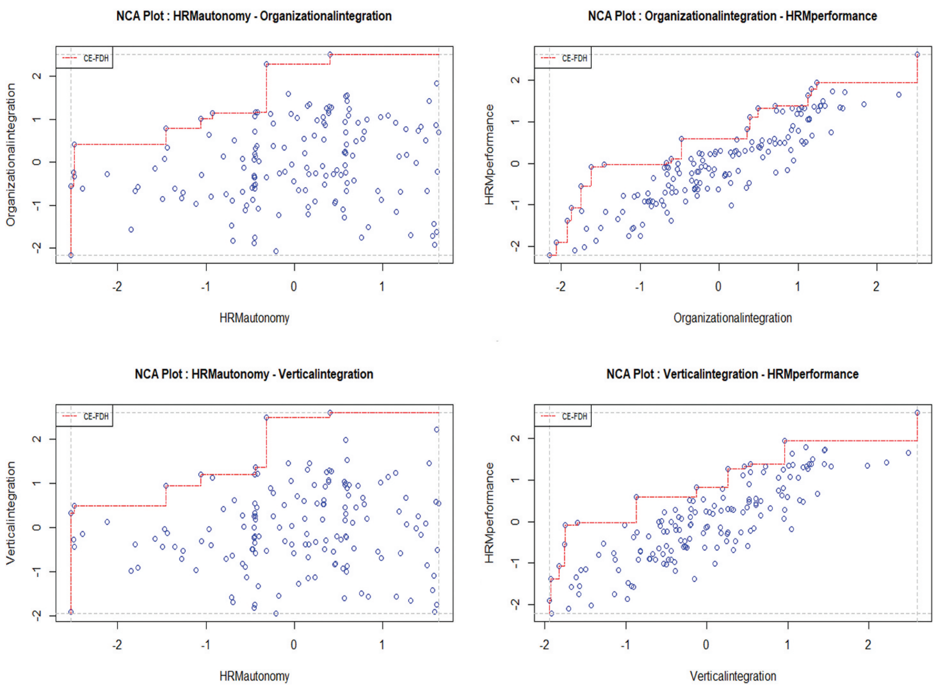

Figure 1. Scatterplots between HRM autonomy and organizational integration (top left), HRM autonomy and vertical integration (bottom left), organizational integration and HRM performance (top right), and vertical integration and HRM performance (bottom right).

Table 2. Results from the NCA and SEM analyses for HRM integration.

	Vertical HRM integration			Organizational HRM integration		
	ES	*p*-value	95% CI	ES	*p*-value	95% CI
Necessity[a]						
HRM autonomy	0.21	0.039		0.22	0.019	
Sufficiency						
HRM autonomy	−0.01 (0.13)	0.948	−0.27:0.25	0.04 (0.49)	0.927	−0.91:0.99
Gender	0.13 (0.12)	0.292	−0.11:0.37	0.13 (0.14)	0.341	−0.14:0.40
Age	−0.01 (0.01)	0.588	−0.04:0.02	0.01 (0.02)	0.717	−0.03:0.04
Education	−0.24 (0.12)	0.051	−0.48:0.00	−0.13 (0.12)	0.297	−0.37:0.11
Tenure	0.01 (0.01)	0.523	−0.02:0.03	−0.01 (0.01)	0.826	−0.03:0.02
Agency type[b]	0.24 (0.18)	0.185	−0.12:0.60	0.40 (0.36)	0.272	0.31:1.11
Organizational size[c]	0.05 (0.10)	0.581	−0.14:0.24	0.03 (0.11)	0.754	−0.17:0.24

[a]As NCA is bivariate in nature, the control variables are not included here.
[b]Reference category = agency without legal independence.
[c]Refers to the log of organizational size.
ES = effect size (d for necessity and B (SE) for sufficiency).
CI = confidence interval.

Table 3. Results from the NCA and SEM analyses for HRM performance.

	ES	*p*-value	95% CI
Necessity[a]			
Vertical HRM integration	0.33	<0.001	
Organizational HRM integration	0.39	<0.001	
Sufficiency			
Vertical HRM integration	0.06 (0.38)	0.880	−0.69:0.80
Organizational HRM integration	0.69 (0.32)	0.032	0.06:1.31
HRM autonomy	0.07 (0.05)	0.171	−0.03:0.18
Gender	0.06 (0.10)	0.563	−0.13:0.24
Age	−0.01 (0.01)	0.472	−0.03:0.02
Education	−0.05 (0.09)	0.534	−0.23:0.12
Tenure	0.01 (0.01)	0.606	−0.02:0.03
Organizational size[b]	−0.08 (0.06)	0.159	−0.20:0.03

[a]As NCA is bivariate in nature, the control variables are not included here.
[b]Refers to the log of organizational size.
ES = effect size (*d* for necessity and *B* (SE) for sufficiency).
CI = confidence interval.

Table 4. Bottleneck tables (in %).

Y = Vertical alignment		Y = Organizational alignment		Y = HRM performance		
Y	HRM autonomy	Y	HRM autonomy	Y	Vertical alignment	Organizational alignment
0	0.0	0	0.0	0	0.0	0.0
10	0.0	10	1.9	10	1.1	5.3
20	0.0	20	5.3	20	2.7	5.5
30	0.0	30	5.9	30	5.1	7.7
40	0.0	40	5.9	40	5.1	10.8
50	0.0	50	27.4	50	24.3	22.8
60	25.6	60	27.4	60	31.8	22.8
70	25.6	70	28.3	70	31.8	22.8
80	53.5	80	51.0	80	49.7	61.2
90	53.5	90	100.0	90	100.0	100.0
100	70.3	100	100.0	100	100.0	100.0

In addition, for an average level of HRM performance (i.e. 50%), a minimum level of 24.3% for vertical alignment and of 22.8% for organizational alignment is necessary. In addition, it shows that to achieve high levels of HRM performance, HRM should be strongly integrated.

Results from structural equation model

To assess sufficiency in the relationships, the estimates from the structural model of the SEM analysis are evaluated. This model showed acceptable model fit (CFI = 0.95; TLI = 0.94; RMSEA = 0.04; SRMR = 0.05). Table 2 shows how HRM autonomy is related to vertical and organizational HRM integration. The results indicate that HRM autonomy is not related to both vertical ($B = -0.01$, $p = 0.948$) and organizational HRM integration ($B = 0.04$, $p = 0.927$), thereby rejecting hypotheses 1b and 2b. Thus, according to our data increasing levels of HRM autonomy are not related to more integration between HRM and the organizational strategy nor between HRM and other departments.

As shown in Table 3, vertical HRM integration is not related to HRM performance in our data ($B = 0.06$, $p = 0.880$), providing no support for hypothesis 3b. This finding suggest that more integration between HRM and the organizational strategy does not matter for how the HRM department is perceived to perform. In contrast, organizational HRM integration is positively related to HRM performance ($B = 0.69$, $p = 0.032$), meaning that more integration between the HRM department and other departments is related to higher HRM performance. Given this finding, hypothesis 4b is supported. Logically, the findings above do not suggest a positive indirect effect of HRM autonomy on HRM performance through vertical HRM integration ($B = -0.01$, $p = 0.953$) or organizational HRM integration ($B = 0.03$, $p = 0.928$).

Discussion

This study addresses some of the lacunas that remain in our understanding of the link between autonomy and performance in (semi-)autonomous government agencies. Previously, rhetoric and research were not in line, where the former emphasized the necessity of HRM autonomy for the presence of a business-like HRM approach and performance, while the latter has exclusively focused on the sufficiency of HRM autonomy. By combining necessary condition analysis and structural equation modelling, we are able to combine views on the autonomy-performance link and add value to the understanding of the relationship between the constructs (Richter et al. 2020).

Using HRM integration as illustrative of what business-like HRM contains, our analysis showed that HRM autonomy is a statistically meaningful and necessary, but not a sufficient, condition for HRM integration. In other words, a certain level of autonomy is needed for agencies to integrate HRM effectively in the organization but increasing autonomy beyond this level is not related to improving integration. Our analysis also showed that both vertical and organizational integration are statistically meaningful and necessary conditions for HRM performance, while improving on organizational integration is also related to higher performance.

An important contribution of our study is that the findings show that the relationships in the autonomy-performance link differ depending on whether one examines them from a necessity or a sufficiency point of view. These differences have implications not only for studies on HRM autonomy, but also for studies on other aspects of managerial autonomy, such as financial or strategic. Scholars need to be aware that their research design and method is able to test the hypotheses they are stating adequately, regardless of whether they test claims of necessity or sufficiency. They need to be particularly wary of hypotheses based on necessity relationships, as they have been often tested inadequately.

For practitioners, our study shows that providing autonomy can, through the presence of HRM integration, lead to high performance in government agencies. This finding has implications for HRM managers at those agencies, but also for policymakers at central government. By providing adequate levels of HRM autonomy to agencies, policymakers can create the conditions that are necessary for agencies to achieve high levels of performance. Alternatively, providing inadequate levels of autonomy seriously inhibits agencies to perform well, and may lead to a situation of 'agencification paradox' (Smullen, Van Thiel, and Pollit 2001), in which autonomy may even lead to lower performance (Voorn, Borst, and Blom 2020).

The results of this study should be interpreted with care. First, we analysed data that is based on Dutch government agencies. Although we argue that the Netherlands provides a relevant case, this single country focus does limit the generalizability of the findings. The autonomy experienced by a government agency and the effect it has on internal management and performance may differ across countries. In particular, the degree to which government has embraced and adopted New Public Management-inspired reforms, such as agencification, and the administrative culture can influence how government agencies will and are able to adopt business-like HRM. The Netherlands has been characterized as an average adopter of NPM-reforms and a comparison with above average adopters (e.g. UK and New Zealand) and below average adopters (e.g. Italy and Spain) would provide more insight into country-level effects (Van Thiel 2012). Similarly, country differences may be present in how HRM is and can be integrated in the organization. Previous findings suggest that strategic HRM is most strongly adopted by Western countries and less or in another way in other countries (Bowen, Galang, and Pillai 2002) and a cross-country analysis is needed to understand the linkages between HRM autonomy, integration and performance better. Second, as with other analytical techniques, the necessary condition analysis we performed is not able to establish causality. Observing a pattern in the data is not the same as evidence of a causal relationship. It is therefore essential that the necessary conditions, in this case HRM autonomy for HRM integration and HRM integration for HRM performance, are well discussed and justified. Although we have tried to provide these justifications, future research is needed that is better able to establish causal relationships. Although a truly random experiment is unfeasible for this subject, some form of natural experiment, or at least a longitudinal study, would result in a better understanding of the causality in the autonomy-performance link (see for a recent example Bjørnholt, Boye, and Mikkelsen 2022).

Third, next to the inability to establish causality our data potentially suffers from common method variance due to the use of single informants. While our focus was on how these informants perceive how the HRM department operates and statistical tests revealed no differences between groups of employees nor the presence of a single factor, it is nevertheless relevant to replicate this research using multiple informants. Findings from such research will add to the results from this study.

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