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'Through the looking-glass': addressing methodological issues in analyzing within- and between-sector differences in employee attitudes and behaviors

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ABSTRACT



Many studies have investigated potential differences in employee attitudes and behaviors across sectors. However, empirical evidence in this regard remains largely inconclusive or even contradictory. Although theoretical explanations may exist, it cannot be ruled out that there are issues pertaining to methodological choices at play as well. The aim of this contribution is to explore whether two issues, one related to the justification of interpreting the public sector as a homogenous one and one to controlling for measurement invariance, influence conclusions of comparative research. Using a Dutch data set containing 1,998 respondents, we tested the impact of these two issues on four concepts that have gotten much attention in employee level comparative research, namely work satisfaction, organizational commitment, proactivity toward self-development, and public service motivation. Our findings demonstrate that differences exist within the public sector and that lack of measurement invariance affects results, which, in turn, affect conclusions regarding within- and between-sector comparisons. We therefore recommend that scholars recognize these issues before conducting comparative research.

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In the fields of HRM and public management, there are many studies that compare the private and public sector at the employee level, aimed at testing differences between government and business employees (Baarspul and Wilderom 2011; Rainey and Bozeman 2000). This kind of research is often based on the assumption that government employees and private sector employees differ on some essential characteristics (Baarspul and Wilderom 2011; Rainey and Bozeman 2000; Van de Walle 2004).

Expected differences are based on theory, but the empirical evidence remains largely inconclusive or even contradictory. That is, studies disagree with each other in the magnitude and direction of the differences. For example, some studies showed that business employees are more committed to their work organization than government employees (Buelens and Van den Broeck 2007; Zeffane 1994), while other studies, contradictorily, found that government employees are more committed (Balfour and Wechsler 1990), or found no difference between sectors (Hansen and Kjeldsen 2018; Steinhaus and Perry 1996). Although theoretical explanations may exist, it cannot be ruled out that issues pertaining to methodological choices are at play as well (Baarspul and Wilderom 2011; Jilke, Meuleman, and Van de Walle 2015; Steinhaus and Perry 1996).

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While earlier theorizing has recognized the limitations of using a dichotomous public-private distinction (Bozeman and Bretschneider 1994), the public management literature has often relied on it when comparing sectors. That is, although scholars have argued that the public sector needs to be disentangled into more refined groups (Andrews, Boyne, and Walker 2011), many comparative studies, so far, have presented the public sector as one homogeneous sector, thereby suggesting an oversimplified representation (e.g. Buelens and Van den Broeck 2007; Wang, Yang, and Wang 2012; Zeffane 1994). As a result, it cannot be ruled out that mixed evidence in comparative research is partly due to the composition of the public sector in each study.

In this study, we investigate the impact of variations in public sector organizations at the national or federal level on employee level outcomes. Addressing these variations is important, as previous research, especially in Europe, has pointed toward the distinction between ministries – central government organizations primarily responsible for policy making, also referred to as government departments, bureaus, or secretariats – and agencies – organizations primarily responsible for policy implementation, also referred to as semi-autonomous or executive agencies – as a level of differentiation that is important to consider (Selin 2015). Specifically, agencies are seldom investigated separately from ministries in empirical research on employee attitudes and behaviors (Blom 2020), although studies have claimed that they are distinct and varying in important aspects, such as the level of bureaucracy (Kickert 2001; Pollitt and Bouckaert 2011).

In addition to an oversimplified representation of the public sector as homogeneous, most studies do not seem to account for the fact that items used in measurement instruments can have different interpretations in different groups, which may stem from construct, method, and item bias (Jilke et al. 2015). To prevent biased results and incorrect conclusions, controlling for measurement invariance is argued to be essential in comparative research (Vandenberg and Lance 2000). Unfortunately, this practice does not seem to be common in public administration literature yet (for recent exceptions, see Borst 2018; Hansen and Kjeldsen 2018; Van Loon 2017).

Therefore, in this study, using multigroup structural equation modeling (SEM), we aim to explore if addressing the above-mentioned two issues – disentangling the public sector at the national level and controlling for measurement invariance – affect conclusions of comparative research. We test the impact of both issues for four well-established employee level concepts that have received thorough attention in comparative research: work satisfaction (Kjeldsen and Hansen 2018; Wang et al. 2012), organizational commitment (Hansen and Kjeldsen 2018; Zeffane 1994), proactivity toward self-development (De Cooman et al. 2009; Willem, De Vos, and Buelens 2010), and public service motivation (PSM; Andersen, Pallesen, and Pedersen 2011; Taylor 2010). Secondary survey data from 1998 employees were analyzed that were collected in the Netherlands in 2014. We compared the results using the “traditional” approach – i.e. comparing one homogeneous public sector and business organizations without controlling for measurement invariance – with the results using the “new” approach – i.e. separating between ministries and agencies and controlling for measurement invariance. Using this methodology, some of the inconsistencies found in comparative research may be better understood and, in addition, our findings may provide future research guidelines for comparing sectors.

The remainder of this article is structured as follows. First, the types of organizations included in this study are discussed, followed by a discussion of the four employee level concepts, and our expectations regarding the influence of controlling for measurement invariance in comparative research. Second, we describe how we use multigroup SEM to answer our research question, followed by the findings. Finally, we discuss the implications of our findings, the study’s limitations, and suggestions for future research.

Theory

Distinction between government, businesses, and semi-autonomous agencies

The premise of sector comparative research is that there is a fundamental distinction between governments and businesses that explains differences among employees. In this regard, scholars

can adopt a one-dimensional approach based on ownership –also referred to as the core approach – to distinguish among organizations. In addition, the publicness approach argues that organizations vary in the degree of publicness, depending on “the extent to which externally imposed political authority affects them” (Bozeman and Bretschneider 1994, 202). Although often studied separately, these two approaches are complementary, rather than alternatives, and have merit on their own (Antonsen and Jorgensen 1997), as both have shown to explain differences among organizations.

Previously, studies have primarily adopted the one-dimensional or core approach to explain differences in employee attitudes and behaviors between sectors. In short, these studies divide respondents into either the public or private sector, often without a precise description of the types of organizations included in the specific research (for an exception, see Zeffane 1994). Recently, scholars have focused on a more conscientious sampling strategy by selecting similar types of jobs or occupational groups across sectors (Andersen, Pallesen, and Pedersen 2011; Hansen and Kjeldsen 2018; Kjeldsen and Hansen 2018). Others have taken a different perspective by comparing sectors based on a normative distinction of people-processing and people-changing organizations (Borst 2018; Van Loon 2017), with their classification of people-changing organizations showing great overlap with the semipublic or hybrid sector used in other comparative studies (Blom et al. 2020; Lan and Rainey 1992; Wittmer 1991). Altogether, these recent developments show that scholars have become aware of the limitations in sample classification in earlier research and, as a result, have called for more research aimed at providing greater insights into differences in employee attitudes and behaviors across sectors.

Nevertheless, although the need to study possible differences between ministries and agencies has been emphasized for a long time (Selin 2015), unfortunately, most comparative studies in public management literature still investigate ministries and agencies as one homogeneous public sector (for an exception, see Hodgkinson et al. 2018). Albeit government-owned and under ministerial responsibility, agencies are organizationally distinct and, to a varying degree, independent from ministries (Selin 2015). Agencies are expected to operate under business-like conditions, have organizational autonomy and sometimes have legal personality (Kickert 2001). Thus, agencies operate (semi-)autonomously from but under political control of central government (Verhoest et al. 2010), and, as a further differentiation, legally independent agencies operate more autonomously than legally dependent agencies. Therefore, we posit that the core approach, with its sole emphasis on ownership, is not a sufficient framework to distinguish among ministries, agencies, and businesses.

The publicness approach, however, does offer an appropriate framework for our study as it acknowledges that differences in both ownership and political control can explain sector differences in employee attitudes and behavior. In particular, we theorize that while ownership explains differences that result from the type of work (public vs. for-profit) that is performed and the type of goods or services (public vs. for-profit) that are produced. Furthermore, political control is a better predictor for differences in the level of bureaucracy and, in turn, differences in employee attitudes and behaviors (Rainey and Chun 2007). In the absence of markets as sources of information, political authorities establish accountability and control mechanisms in the form of compliance rules (i.e. implying higher degrees of bureaucracy) (Feeney and Rainey 2010), which have been found to alienate employees from their organization and negatively to affect their attitudes and behaviors (Blom, Borst, and Voorn 2019; DeHart-Davis and Pandey 2005).

As agencies are claimed to differ from ministries on the degree of political control (Pollitt and Bouckaert 2011; Walker and Brewer 2008), we posit that it is valuable to include agencies as distinct groups in sector comparisons. Although there are several studies focusing solely on agencies and indicating their uniqueness in comparison with ministries (e.g. Park and Rainey 2007), few studies have used this distinction in comparative analyses (for an exception, see Moldogaziev and Silvia 2015).

Below, we describe which differences we would expect for the four selected employee level concepts based on differences in ownership and political control. Although we acknowledge that the degree of political control may, and probably will, vary among businesses as well, we decided to follow previous literature by treating businesses as a group of organizations that, on the whole, experiences less political control in comparison with ministries and agencies (Rainey and Chun 2007; Johansen and Zhu 2014). Given that the main objectives of this study are to investigate if disentangling the public sector into ministries and agencies and to examine whether accounting for measurement invariance affects conclusions on comparative research, we are treating businesses as a control group when analyzing differences between our two approaches.

Work satisfaction and organizational commitment. In the past years, many studies comparing the public and private sector have emphasized work satisfaction and organizational commitment as important workplace attitudes (Balfour and Wechsler 1990; Hansen and Kjeldsen 2018; Wang et al. 2012; Zeffane 1994). These concepts are two related organization-oriented attitudes that are linked to employee productivity and turnover (Brooke, Russell, and Price 1988; Mathieu and Farr 1991). Theoretically, it is argued that the political control that public organizations face is accompanied with extensive administrative requirements – i.e. a high level of bureaucracy – that, in turn, have a detrimental effect on these employee attitudes (Feeney and Bozeman 2009; Pandey and Kingsley 2000; Rainey and Bozeman 2000). In particular, a high level of red tape is shown to alienate people from their work organization by decreasing the opportunity meaningfully to contribute to it, leading to less satisfied and committed employees (DeHart-Davis and Pandey 2005; Stazyk, Pandey, and Wright 2011).

In contrast to ministries, agencies face less political control and, hence, are expected to have lower levels of bureaucracy (Pollitt and Bouckaert 2011; Walker and Brewer 2008). This prospect of reduced bureaucracy was one of the main reasons to create agencies at arm's length of government in the first place. Furthermore, agencies with legal independence are expected to face less political control than agencies without legal independence. Taking the differences in political control into account, we expect that work satisfaction and organizational commitment are lowest in ministries, followed by agencies without legal independence, agencies with legal independence, and businesses (first hypothesis).

Proactivity toward self-development. Comparative research focusing on work values has repeatedly found that government employees, compared to business employees, place significantly less importance on career development (De Cooman et al. 2009; Frank and Lewis 2004; Lyons, Duxbury, and Higgins 2006). Although this lower importance for career development could be interpreted as government employees being unambitious and lazy, which has been a persistent stereotype about civil servants (Van de Walle 2004), scholars mainly point out that government employees are more other-focused than self-focused. This does not imply that government employees are not willing to improve themselves, but that they may be less focused toward career-oriented development than business employees, here referred to as proactivity toward self-development.

Although the lower tendency for career-oriented development has a motivational base, sector differences may also result from organizational features (DeVaro and Brookshire 2007). In government, promotion systems are often based on seniority, which creates a work environment that is unfavorable for ambitious and career-driven individuals. As a result, in government, proactivity toward self-development has a lower chance to be rewarded with a promotion, thereby discouraging government employees proactively to develop their competences.

Agencies are generally obliged to follow the same HR-policies as ministries (Verhoest et al. 2012), which can lead to challenges (Blom et al. 2019), although the pressure to oblige may differ on the degree of political control the agency experiences. Part of these obligations entails the use of a promotion system similar to that of ministries, although agencies with legal independence do experience some room to maneuver in the implementation of these policies. Therefore, it is expected that proactivity toward self-development is lowest in ministries, followed by agencies

without legal independence, agencies with legal independence, and finally businesses (second hypothesis).

Public service motivation. In contrast to the other concepts, the concept of PSM was initially introduced in the public administration literature (Perry, Hondeghem, and Wise 2010). As empirical studies on PSM in a public sector context emerged, so did studies that compared public and private sector employees. PSM is depicted as an individual predisposition that is typically present in the public sector (Perry 1996). It is described as a concept that includes the dimensions *attraction to public policy making* (APP), *compassion* (COM), *commitment to public interest* (CPI), and *self-sacrifice* (SS), where the last two dimensions are often collapsed into one dimension (Vandenabeele 2008). Although not restricted to public organizations, PSM is “grounded in the tasks of public service provision, and is more prevalent in government than other sectors” (Perry et al. 2010, 682).

Since PSM is defined as a relatively stable predisposition to serve the public cause (Bakker, 2015), it is less influenced by organizational features than typical organization-oriented concepts such as work satisfaction and organizational commitment. Rather, sector differences are more likely the result of the type of work that attracts people with different levels of PSM. Since people with high levels of PSM are attracted to public sector work and are likely to keep working within the public sector (Carpenter, Doverspike, and Miguel 2012; Pedersen 2013; Wright and Christensen 2010), PSM is generally thought to be higher in the public sector than in businesses.

Besides differences between public organizations and businesses, research also indicates differences within public organizations (Van Loon 2017). Even if people are more inclined to work for the public sector in general, the type of public service work influences where they precisely decide to work within the broader category of the public sector (Kjeldsen 2014). In this respect, the type of work performed in ministries is substantially different from that in agencies (Kickert 2001). Agencies are generally responsible for public service delivery, while ministries retain responsibility for policy making. This division of responsibilities has a direct consequence on the task that employees perform in these organizations and, in turn, on the attraction of employees with different levels of PSM. This seems especially apparent for individuals with a high attraction to public policy making, as they are more likely to be attracted to ministries than to agencies. For the other dimensions of PSM, it is less clear what the differences between employees working at ministries and those in agencies are. Nevertheless, we expect that PSM is highest in ministries and lowest in businesses, with both types of agencies scoring in between (third hypothesis).

Measurement invariance in comparative research

Traditionally, scholars have always been interested in, and critical about, the methodological choices made in comparative studies in public administration, including issues around comparability of samples (e.g. Fitzpatrick et al. 2011; Gill and Meier 2000; Van Wart and Cayer 1990). In the early 1990s, Peters (1994) already pointed out that even if we employ valid and reliable scales to measure certain concepts, we cannot be certain that these concepts have the same meaning across different populations and across time periods. Although Peters argued that measurement invariance – i.e. a shared understanding of the same concept across various subgroups of respondents (Davidov et al. 2014) – stems from the use of mid-range theory that is only applicable in a particular context, other public administration scholars have recently focused on measurement invariance as a methodological issue that needs to be controlled for statistically (Jilke et al. 2015).

Whereas controlling for measurement invariance is common practice in research fields such as psychology, sociology, and management (Byrne, Shavelson, and Muthén 1989; Davidov et al. 2014; Steenkamp and Baumgartner 1998; Vandenberg and Lance 2000), this is certainly not the case for the field of public administration (Jilke et al. 2015). In fact, in recent years, only a few comparative studies have tested for measurement invariance (Borst 2018; Van Loon 2017). As a

comprehensive and technical examination of measurement invariance in public administration is beyond the scope of this study, and as it has already been thoroughly discussed by Jilke et al. (2015), we will only describe the three major hierarchical forms of measurement invariance – configural, metric, and scalar – that are needed before means can be accurately compared across groups.

Configural invariance, comprising the lowest level of invariance, is associated with the absence of construct bias, meaning that the interpretation of a concept is shared among different groups (Van de Vijver and Tanzer 2004). It implies that the pattern of the item loadings of a latent construct is similar across groups (Davidov et al. 2014; Steenkamp and Baumgartner 1998). For example, looking at our study, configural invariance is established when all measured items for organizational commitment are significant indicators across all sectors. The next level of invariance, *metric invariance*, focuses on the response behavior of people across groups (Steenkamp and Baumgartner 1998). Metric invariance is established when not only the pattern of item loadings, but also the strength of the item loadings is similar across groups. Consequently, this means that a one-unit increase in the observed scores is associated with a similar increase in the latent scores across groups (Jilke et al. 2015). Finally, *scalar invariance* refers to the consistency between group differences in latent means, on the one hand, and group differences in observed means, on the other hand. While an observed mean is the average of the observed item means, a latent mean can be interpreted as the weighted average of the observed item means, with the weight being dependent on the item loadings and intercepts. Thus, one of the advantages of using latent means instead of observed means is that it takes the importance of an item to the overall construct into account. Because latent means are dependent on the item loadings and intercepts, it is important that they be similar across groups when comparing group means. In this respect, lack of scalar invariance – i.e. dissimilar loadings and intercept across groups – indicates a systematic upward or downwards bias (Steenkamp and Baumgartner 1998). Thus, if scalar invariance is not established, comparing latent means is pointless as the latent constructs do not share the same response behavior, origin, or both (Davidov et al. 2014), and, consequently, incorrect conclusions may be drawn about sector differences.

Following standard practice, in this contribution, we will test the three hierarchical forms of measurement invariance discussed above. If full metric or scalar invariance cannot be established, we will test for partial invariance (Byrne et al. 1989). The goal of partial invariance is to identify those loadings or intercepts that differ across groups and to remove them from the comparative analyses as long as at least two loadings and intercepts remain (Van de Schoot, Lugtig, and Hox 2012).

Method

Data

For this study, secondary survey data collected in 2014 by the Dutch Ministry of Internal Affairs (2015) was used. Every two years, the Ministry surveys a representative sample of public sector employees who are randomly extracted from the Ministry's data warehouse, which contains information from all civil servants. In 2014, 87,536 public sector employees from ministries, agencies, municipalities, the judiciary, educational and research institutions, university hospitals, and legal authorities were invited to fill in a web-based survey using a personal code. 24,334 public sector employees (response rate: 28%), of whom 3502 worked at (semi-)governmental organizations (including ministries and agencies) at the national level, filled in the survey. According to the Ministry, these 3502 employees constitute a representative sample of the population of (semi-)governmental employees in the Netherlands in terms of age, gender, and ethnicity. In addition, 4300 people employed in the private sector were invited as a reference group of whom 2227 employees (response rate: 52%) filled in the survey. These 2227 employees are a representative

sample of private sector employees in the Netherlands in terms of age and gender (Central Bureau for Statistics 2019).

Participants selection

We selected specific participants from the dataset to create four groups. First, the group of *ministries* consisted of 501 employees working at a ministerial department. As mentioned earlier, ministries are central government organizations primarily responsible for policy making and, therefore, can be viewed as organizations that operate at the core of central government.

Second, we distinguished between two types of agencies, that is, agencies with and without legal independence, as scholars have argued that legal independence is an important factor in explaining organizational differences (Selin 2015, Verhoest and Wynen 2018). Following the categorization of public organizations by Van Thiel (2012, 20), we included so-called Type 1 agencies and Type 2 agencies. *Type 1 agencies* have some degree of organizational autonomy but no legal personality (e.g. the Next Steps Agencies in the UK). This group consisted of 788 employees working at an *Agentschap*, which is the most common Type 1 agency in the Netherlands. *Type 2 agencies* have both organizational autonomy and legal personality (e.g. public establishments in France and Italy, statutory bodies in Australia, and non-departmental public bodies in the UK). This group consisted of 313 employees working at a *Zelfstandig bestuursorgaan* (ZBO), which is the most common Type 2 agency in the Netherlands. Finally, the group of *businesses* consisted of 1,662 employees working in for-profit businesses, excluding employees working at for-profit healthcare organizations.

In line with recent research (Kjeldsen and Hansen 2018), several steps were taken to improve the comparability of the four groups. First, from the employees working in for-profit businesses, we only selected white-collar employees working in service-oriented positions. Second, we excluded respondents who performed tasks related to policy making and inspection, since these tasks are almost exclusively performed in ministries. Third, we excluded respondents that performed tasks related to sales, since these tasks are mostly related to the private domain. Using this categorization, the final data set contained 358 respondents from ministries, 695 from Type 1 agencies, 306 from Type 2 agencies, and 639 from businesses.

Measures

All items were answered on a 5-point Likert scale and all rating scales ranged from 1 (*totally disagree*) to 5 (*totally agree*). The questionnaire items are shown in Appendix A.

Work satisfaction

Work satisfaction was examined using three items in line with various satisfaction scales (Cammann et al. 1983; Rentsch and Steel 1992; Tsui, Egan, and O'Reilly 1992). An example item is: 'I am satisfied with my job' ($\alpha = 0.79$).

Organizational commitment

Organizational commitment was measured using four items derived from a scale developed by Meyer, Allen, and Smith (1993), which has been applied in previous research (e.g. Hansen and Kjeldsen 2018; Meyer et al. 2002). An example item is: 'I experience problems of this organization as my own problems' ($\alpha = 0.84$).

Proactivity toward self-development

Proactivity was measured using three items that have been validated in earlier research (Bateman and Crant 1993; Borst, Kruyen, and Lako 2019). An example item is: 'I constantly try to improve myself in my profession' ($\alpha = 0.81$).

PSM

PSM was measured using ten items from Perry (1996) reflecting the three dimensions *attraction to public policy making* (APP), *compassion* (COM), and *commitment to the public interest/self-sacrifice* (CPISS), as applied in previous research (Van Loon et al. 2018). Two items were used to measure APP, four items to measure CPISS and four items to measure COM. Confirmatory factor analyses (CFAs) with a robust maximum likelihood (MLR) estimator showed an adequate fit (CFI = 0.95; TLI = 0.93; RMSEA = 0.07; SRMR = 0.04) and reliability ($\alpha = 0.78$) for a model with items from the three dimensions loading onto one factor.

Control variables

In line with previous comparative research (e.g. Andersen, Pallesen, and Pedersen 2011; De Cooman et al. 2009; Hansen and Kjeldsen 2018), we included age, gender, education, and organizational tenure, and organizational size as control variables to account for any differences in latent means.

Analytical procedure

To compare the groups, several analytical steps were taken using the *lavaan* package in R (Rosseel 2012). Confirmatory factor analyses (CFAs) with a MLR estimator were conducted to test the general measurement model for the full sample as well as for the four groups separately. The MLR estimator computes test statistics using a scaling correction factor and computes standard errors using a sandwich approach. A CFI and TLI above 0.90 is indicative of an adequate fit and above 0.95 of an excellent fit. An RMSEA and SRMR below 0.08 is indicative of an adequate fit and below 0.05 of an excellent fit (Hu and Bentler 1999).

Using multi-group Structural Equation Modeling (SEM), we tested for differences in means using the "traditional" approach. Here, we compared the public sector (including both ministries and agencies) with businesses regarding the four concepts without controlling for measurement invariance. Significance in mean differences was tested using the Wald test statistic, which equals to a Z test in case of a bivariate comparison.

Multi-group SEM was also used to test for differences in means using the "new" approach in which the four groups (ministries, Type 1 agencies, Type 2 agencies, and businesses) were compared. First, measurement invariance was tested across all four groups (Van de Schoot et al. 2012). In the configural invariance model, all parameters were estimated freely across the distinguished groups. In the metric invariance model, item loadings were fixed to be equal across groups while the intercepts were freely estimated. In the scalar invariance model, both the item loadings and intercepts were fixed to be equal across groups. These models were compared using cutoff criteria of ≤ -0.005 in CFI and ≤ 0.01 in RMSEA for indications of invariance as well as for checking for significant and substantial expected parameter changes (Chen 2007; Meuleman 2012). In case full measurement invariance could not be established, fixed parameters with significant univariate score tests and expected parameter changes (EPCs) larger than 0.1 were freed to establish partial measurement invariance (Meuleman and Billiet 2012).

As mentioned before, to compare latent means accurately, it is essential that both item loadings and intercept are equal across groups. Therefore, we compared the means of the latent constructs across the four groups if at least partial scalar invariance was established. Again,

significance in mean differences across all groups was tested with the Wald test statistic. Although our focus is on analyzing variations within the public sector while treating the businesses group as fixed, we have included the latent means of various business subsectors in Appendix C to show variations within the private sector.

After analyzing latent means using both approaches, we compared the results to determine if and to what degree conclusions differ between the two approaches.

Results

Measurement model

To test the measurement model, a CFA with a MLR estimator was conducted including all variables. The results showed an adequate model fit (CFI = 0.93; TLI = 0.92; RMSEA = 0.06; SRMR = 0.05). The measurement model also showed an adequate fit for each of the groups separately (see Appendix B for fit statistics per group).

Investigating mean differences using “traditional” approach

The latent means of the public sector versus the business group are shown in Table 1. For work satisfaction, the findings indicate no significant differences between the two groups. Organizational commitment appears to be higher in businesses than in the public sector ($M_{diff} = 0.51, p < 0.001$). Furthermore, higher means are found in the public sector (containing both ministries and agencies) for proactivity ($M_{diff} = 0.99, p = 0.07$) and for PSM ($M_{diff} = 0.23, p < 0.05$). Thus, the results for organizational commitment and PSM are in line with expectations, while the results for work satisfaction and proactivity are not.

Investigating mean differences using the “new” approach

Before means were compared using the new approach, measurement invariance of the measurement model was tested across the four groups, and the results are shown in Table 2. Starting with the configural invariance model, the fit indices indicate that construct bias is not an issue across the four groups and that the pattern of item loadings is similar (CFI = 0.931, RMSEA = 0.055). In other words, employees across the four groups have the same interpretation of the

Table 1. Latent means and standard errors across groups for both approaches.

	'Traditional' approach			'New' approach				Wald
	Public sector ^a	Businesses	Z	Ministries	Type 1 agencies	Type 2 agencies	Businesses	
	M (SE)	M (SE)		M (SE)	M (SE)	M (SE)	M (SE)	
Work satisfaction	4.43 (.28)	4.06 (.08)	1.62	4.15 (.11)	4.04 (.09)	4.12 (.09)	4.00 (.06)	2.12 ^b
Organizational commitment	3.15 (.33)	3.66 (.09)	13.07**	3.34 (.11)	3.29 (.10)	3.46 (.09)	3.51 (.07)	7.26* ^c
Proactivity	4.31 (.36)	3.32 (.16)	3.33 [†]	3.51 (.14)	3.52 (.13)	3.59 (.13)	3.50 (.10)	0.03
PSM	3.36 (.22)	3.13 (.13)	6.28*	3.35 (.09)	3.29 (.09)	3.25 (.09)	3.08 (.07)	26.33** ^d

[†] $p < .10$;

* $p < .05$;

** $p < .01$.

^aConsists of ministries and agencies.

^bIndividual z tests reveal significant differences between ministries and Type 1 agencies ($Z = 4.23^*$), ministries and businesses ($Z = 3.88^*$), and Type 2 agencies and businesses ($Z = 3.50^†$).

^cIndividual z tests revealed significant differences between ministries and businesses ($Z = 4.70^*$), Type 1 agencies and Type 2 agencies ($Z = 7.07^{**}$), and Type 1 agencies and businesses ($Z = 12.22^{**}$).

^dIndividual z tests revealed significant differences between ministries and Type 2 agencies ($Z = 4.38^*$), ministries and businesses ($Z = 26.81^{**}$), Type 1 agencies and businesses ($Z = 24.66^{**}$).

Table 2. Measurement invariance results.

	CFI	ΔCFI	RMSEA	$\Delta RMSEA$
Configural model	.931	–	.055	–
Metric model	.928	–.003	.054	–.001
Scalar model	.907	–.021	.060	.005
Partial scalar model ^a	.924	–.004	.055	.001

^aItem intercepts freed of the items of the APP dimension of the PSM construct, one item of the CPISS dimension of the PSM construct, one item of the work satisfaction construct, two items of the organizational commitment construct, and one item of the proactivity.

concepts. For the metric invariance model, the fit indices also showed an adequate fit (CFI = 0.928, RMSEA = 0.054) and the differences with the configural model are below the cutoff criteria ($\Delta CFI = -0.003$, $\Delta RMSEA = -0.001$). These findings indicate that the strength of the item loadings is similar across the four groups. Thus, not only do employees across these groups share the same interpretation of the concepts, their response behaviors are also similar. For the scalar invariance model, the fit indices showed an adequate fit (CFI = 0.907, RMSEA = 0.060), but the difference in CFI with the metric invariance model is above the cutoff criteria ($\Delta CFI = -0.021$, $\Delta RMSEA = 0.005$). It appears that there is a systematic upward or downward bias in the item intercepts. Thus, the latent concepts do not share the same origin across the groups. This means that full scalar invariance could not be established.

Inspection of the results showed several item intercepts with significant univariate score tests and EPCs larger than 0.1. We used an iterative process of freeing one intercept with the highest score test and EPC and comparing the latest partial scalar invariance model to the metric model using differences in fit indices. Using this process, we freed the intercepts for one item of the work satisfaction construct, for both items of the APP dimension, two items of the CPISS dimension of PSM, two items of the organizational commitment construct, and for one item of the proactivity construct. Noteworthy, here we found substantial differences between businesses and the three public groups on the APP dimension of PSM. Although it is still possible to compare latent means of PSM across the four groups, these comparisons are now solely based on the COM and CPISS dimensions. After these steps, the partial scalar invariance model showed an adequate fit (CFI = 0.924, RMSEA = 0.055) which was not significantly worse than the metric model ($\Delta CFI = -0.004$, $\Delta RMSEA = 0.001$). This partial scalar model was used to compare latent means.

As can be seen in Table 1, work satisfaction is slightly higher in ministries compared to Type 1 agencies ($M_{diff} = 0.11$, $p < 0.05$) and businesses ($M_{diff} = 0.15$, $p < 0.05$). Furthermore, satisfaction is slightly higher in Type 2 agencies compared to businesses ($M_{diff} = 0.12$, $p = 0.06$). Organizational commitment is higher in businesses than in ministries ($M_{diff} = 0.17$, $p < 0.05$) and Type 1 agencies ($M_{diff} = 0.22$, $p < 0.01$), and higher in Type 2 agencies than in Type 1 agencies ($M_{diff} = 0.17$, $p < 0.05$). These findings are not completely in line with our first hypothesis, although the higher commitment scores for businesses compared to ministries and Type 1 agencies, and the higher commitment scores for Type 2 agencies compared to Type 1 agencies are as expected. No significant differences are found for proactivity, providing no support for our second hypothesis. Finally, employees in ministries exhibit slightly higher PSM than employees in Type 2 agencies ($M_{diff} = 0.10$, $p < 0.05$), while employees in businesses exhibit lower PSM than employees in ministries ($M_{diff} = 0.27$, $p < 0.05$) and in Type 1 agencies ($M_{diff} = 0.21$, $p < 0.05$). These findings are mostly in line with our third hypothesis, although the expected sequence of ministries, Type 1 and Type 2 agencies, and businesses is not completely supported.

Comparing the “traditional” versus the “new” approach

Comparing the two approaches, the findings show that one would reach somewhat different conclusions depending on which approach is employed. Especially for organizational commitment,

sector differences are quite dissimilar between the two approaches. For organizational commitment, the conclusion from the “traditional” approach would be that there is a difference between the public sector and businesses. In contrast, results from the “new” approach indicate that there are larger differences between ministries and Type 1 agencies, on the one hand, and businesses, on the other hand. Scores of Type 2 agencies are more comparable to that of businesses. This supports the idea that Type 2 agencies are less public than ministries, and, rather, function in a more business-like way.

As regards proactivity toward self-development, the empirical difference between the public sector and businesses in the “traditional” approach is not found in the “new” approach. Finally, the results for PSM show slight differences between the two approaches. It should be noted that, since the tests for measurement invariance indicated that the intercepts for the APP dimension differed across sectors, the comparisons were solely based on the COM and CPISS dimensions.

Discussion

The goal of this study was to contribute to comparative research on employee attitudes and behaviors by addressing two issues pertaining to methodological choices. We aimed to expand our scholarly knowledge from studies that examined one homogeneous public sector (Baarspul and Wilderom 2011), by including ministries and agencies as separate groups in our analyses. Furthermore, we controlled for measurement invariance before comparing our four groups, a practice that has recently been recommended but that is not yet common in public administration research (Jilke et al. 2015). In our study, (slightly) different conclusions are drawn for all four concepts that we analyzed. Including agencies as distinct groups and accounting for measurement invariance can have important consequences for public administration scholars who wish adequately to analyze sector differences on the employee level.

In line with theories and research on publicness, and in contrast to the assumptions of the core approach (Bozeman and Bretschneider 1994; Selin 2015), our finding that ministries and agencies are distinct organizations with respect to employee attitudes and behaviors demonstrates that differences in publicness matter for distinguishing between types of organizations within the public sector. Moreover, while previous research has acknowledged the importance of publicness for differences in public organizations on the organizational level (e.g. Antonsen and Jorgensen 1997; Andrews et al., 2011), our study shows that publicness also matters for differences on the employee level.

While our findings showed differences within the public sector, they also have implications for comparative research on public-private differences. Refraining from disentangling the public sector, thereby treating the sector as homogeneous, might explain some of the mixed results from previous research, as we found that work satisfaction, organizational commitment, proactivity toward self-development, and PSM differ between ministries and agencies. Since most previous studies combined the two groups, scores for the public sector differ according to the ratio of employees working in ministries versus agencies. Consequently, studies comparing the public and private sector may draw different conclusions about if and how employee attitudes and behaviors differ if ministries and agencies are combined or not.

This study contributes to the literature on agencies by demonstrating the variety within these organizations. Our findings support the notion that agencies are hybrid organizations and cannot simply be viewed as having a public character only (e.g. Kim and Cho 2014; Overman and Van Thiel 2016). Moreover, the manifestation of their hybridity is not straightforward, as results indicate that agencies are not simply positioned in between ministries and businesses. For example, employees in legally independent agencies seem to be as committed as businesses employees. In turn, this pattern seems to be opposite for employees in agencies without legal independence. These examples show that even if agencies are included as a distinct group in comparative studies, it should not be expected that their position, relative to ministries and businesses, is fixed across research areas.

Besides the importance of disentangling the public sector, our study also shows that accounting for measurement invariance is important for comparing sectors (Jilke et al. 2015; Vandenberg and Lance 2000). In our study, full measurement invariance was not established for all four concepts, emphasizing that assuming invariance should not be common practice and might lead to biased results. The results for PSM are especially noteworthy, where partial measurement invariance was established after discarding the APP dimension. As there is no similar understanding of PSM when issues related to attraction to public policy making are submitted to the respondents, one can wonder if the construct that remains after discarding the APP dimension is not something different than the theoretical concept of PSM. Thus, in line with Jilke et al. (2015) we urge scholars to include tests for measurement invariance as a standard procedure in future comparative research. We advise research to follow strict guidelines based on differences in global fit indices (Δ CFI, Δ RMSEA) in combination with univariate score tests and expected parameter changes when determining configural, metric, and scalar invariance (Chen 2007; Meuleman 2012).

Limitations and recommendations for future research

One of the main limitations of this study is the use of cross-sectional data only, making it impossible to compare organizations over time. Longitudinal research would be able to not only test for differences over time, but also to investigate whether measurement invariance holds over time.

We also acknowledge that our sample has limitations. First, although our selected ministerial and agency employees as a whole are representative of (semi-)governmental employees at the national level in terms of age, gender, and ethnicity, we were unable to assess the representativeness of the groups separately as no data is available. Second, although we improved the comparability of our sample by excluding participants responsible for policy making and inspection, tasks primarily found among ministerial employees, we were unable to further differentiate among occupations due to the nature of the secondary data. Third, although we included organizational size as a control variable, the nature of the data prohibited us from controlling for other organizational characteristics, such as the degree of hierarchy and formalization. Following these sample limitations, future studies on sector comparisons that are able to collect primary data should further differentiate or control for additional job- and organizational-level characteristics.

Another limitation of our study is the use of a general work satisfaction scale. In our study, we found no differences for work satisfaction, neither between sectors nor between approaches. However, scholars have argued that clear sector differences exist on specific facets of work satisfaction (Wang et al. 2012). Future research should focus on disentangling aspects of work satisfaction while comparing ministries, agencies, and businesses using, for example, an intrinsic and extrinsic distinction, or an organization- and work-related distinction.

Finally, our study contributed to existing literature by including two types of agencies as separate groups. Although insightful, comparative research could further benefit from empirical studies including other types of national-level public organizations as well, such as state-owned enterprises (Andrews, Boyne and Walker 2011). Also, comparative studies that examine variations at the local, regional, or supranational public organizations would be of interest to show possible differences across multiple levels (Durst and DeSantis 1997; Gordon 2011). This way, we can get a more complete picture of the, often subtle, differences between sectors and increase our knowledge in this field.

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Appendix A. Questionnaire items

1. Work satisfaction
 - a. I am satisfied with my job
 - b. I am satisfied with the work itself
 - c. I am satisfied with the organization I work
2. Organizational commitment
 - a. I feel like "part of the family" at my organization
 - b. This organization has a great deal of personal meaning for me
 - c. I feel at home in this organization
 - d. I really feel as if this organization's problems are my own
3. Proactivity toward self-development
 - a. I constantly try to improve myself in my profession
 - b. I actively follow the developments in my field of work
 - c. I am always searching for new ways to do my job even better
4. Public service motivation
 - a. Attraction to public policy making
 - i. "Politics" is a dirty word (reversed)
 - ii. I don't care much about politicians (reversed)
 - b. Commitment to public interest/ Self-sacrifice
 - i. I unselfishly contribute to my community
 - ii. Providing meaningful public service is very important to me
 - iii. Making a difference to society means more to me than personal achievements
 - iv. The general interest is a key driver in my daily life
 - c. Compassion
 - i. It is difficult for me to contain my feelings when I see people in distress
 - ii. I seldom think about the welfare of people whom I don't know personally (reversed)
 - iii. Considering the welfare of others is very important to me
 - iv. If we do not show more solidarity, our society will fall apart

Appendix B. Fit indices of the final measurement model in each group

	<i>CFI</i>	<i>TLI</i>	<i>RMSEA</i>	<i>SRMR</i>
Public sector ^a	.93	.92	.05	.05
Ministries	.93	.92	.05	.06
Type 1 agencies	.92	.91	.06	.05
Type 2 agencies	.94	.93	.05	.06
Businesses	.94	.93	.06	.05

^aIncludes ministries and both types of agencies.

Appendix C. Latent means and standard errors of substantial business subsectors.^a

	Industrial M (SE)	Construction M (SE)	Trade M (SE)	Logistics M (SE)	Financial M (SE)	Services M (SE)	Cultural M (SE)	Businesses M (SE)
Work satisfaction	4.10 (.13)	4.16 (.13)	4.10 (.10)	4.00 (.17)	4.07 (.15)	4.00 (.09)	4.09 (.13)	4.00 (.06)
Organizational commitment	3.86 (.13)	3.95 (.15)	3.74 (.11)	3.65 (.15)	3.56 (.15)	3.51 (.10)	3.55 (.15)	3.51 (.07)
Proactivity	3.24 (.18)	3.13 (.18)	3.38 (.17)	3.46 (.19)	3.36 (.19)	3.38 (.15)	3.33 (.20)	3.50 (.10)
PSM	3.08 (.15)	3.23 (.16)	3.15 (.13)	2.99 (.17)	3.21 (.16)	3.09 (.14)	3.19 (.16)	3.08 (.07)

^aEstimates based on "new" approach.