

## ***Introducing the Contextual Ambidexterity Scale for Public Organizations (CASPO): Scale development and initial evidence***

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**Abstract:** *Contextual ambidexterity describes the organizational capacity of being simultaneously able to adapt and change in the face contextual requirements while keeping alignment and predictability. Contextual ambidexterity has been recognized as an appropriate explanation of organizational performance, and its influence has already permeated accounts of public organizations' dynamics. We join this line of reasoning by suggesting that some specific characteristics of public organizations call for refinement of the contextual ambidexterity concept, and the correspondent evolution in measuring this organizational ability, thus introducing the Contextual Ambidexterity Scale for Public Organizations (CASPO). We suggest going beyond the original measure of alignment and adaptability created by Gibson and Birkinshaw (2004), to include psychological safety, reflexive spaces, and flexibility as sub-dimensions of adaptability and imprinting, rule-following and shared vision as sub-dimensions of alignment. On the basis of a sample of civil servants (n=200), we used exploratory factor analysis to identify a six-dimensional solution covering alignment and adaptability. Using another sample of civil servants (n=200), we used confirmatory factor analysis to test CASPO's construct validity and regression analysis in testing the criterion validity. The results reveal that CASPO shows appropriate metric qualities and that it surpasses Gibson and Birkinshaw's (2004) scale in predicting both their measure of generic organizational performance and a measure of performance specific for public organizations. This study contributes to the creation of sound measures of relevant concepts explaining the performance of public organizations.*

**Keywords:** Contextual ambidexterity; scale development; public organizations; organizational performance; organizational paradoxes

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## **Introduction**

Public organizations are complex entities full of tensions arising from their inherent plurality, resource scarcity and continuous change (Smith & Lewis, 2011). Due to their embeddedness in political systems including diverse ideologies, a plurality of views and goals, usually contradictory, is usual in public organizations. As active players in an ever-changing world, public organizations have to change themselves, which can lead civil servants to show conflicting commitments to the current situation and the unknown future. The allocation of generally scarce financial, time or human resources prompts tensions between competing alternatives for decision and investment. Thus, within public organizations, tension is the norm and not the exception. If managers engage in proper strategies to manage these tensions inherent to organizational life, they will contribute to organizational performance, a notion we can define as “the extent to which it (an organization) is able to survive, perform its mission, and maintain favourable earnings, financial resources (Androniceanu et al., 2019), and asset value” (Yukl, 2008, p. 709), a definition that can be fine-tuned, and connected to the public context if we add the extent to which one organization is able to produce social and economic benefits for society at an acceptable cost, and its longevity (Yukl, 2008).

Recognizing that the search to understand and promote public organizations’ performance has assumed diverse points of view (Cicea, 2020), we draw on the literature that emphasizes the tensional nature of organizations and assume that these entities are best described, understood and managed if we recognize, stress and embrace their persistent tensions (Schad et al., 2016; Smith et al., 2017). Ambidexterity refers to the organizational capability of dealing with the tension arising from the simultaneous search for stability and change, which makes it an appropriate tool to shed light on the antecedents of public organizations’ performance.

Despite this general theoretical appropriateness, we suggest the need for refined conceptualization and measure of the concept of ambidexterity, rendering it more sensitive to the characteristics of public organizations and more actionable in promoting organizational performance. Sound measures of the antecedents of public organizations’ performance can have important consequences for both researchers and practitioners interested in better understanding and improving public delivery. We suggest that the contextual ambidexterity scale for public organizations (CASPO) can fulfill these needs.

The paper is organized as follows. In the literature review section, we briefly introduce the ambidexterity approach and summarize the emerging literature about ambidexterity in the context of public organizations, followed by a proposal to expand the contextual ambidexterity concept that is both more realistic in describing the key components of alignment and adaptability and more sensitive to the organizational characteristics of public organizations. After this, we describe two sequential studies aiming to develop a scale measuring this new conceptualization. After acknowledging the limitations of the research, we end by discussing the

implications of the study for the measurement and promotion of public organizations' performance.

## **1. Literature review**

### **1.1 Ambidexterity and public organizations**

Public organizations' need to pursue somewhat contradictory goals, such as being efficient and innovative (Rinaldi, et al., 2015; Cannaerts et al., 2016). In commenting on the evolution of public administration models, the United Nations (2005) argue in favour of a balance between three broad models of public administration, namely traditional public administration, public management (including the new public management) and responsive governance, overarching models that rely on very different guiding principles: compliance with rules and regulations, efficiency and results and accountability and transparency (Androniceanu, 2021), respectively. The need to change is stressed more recently, when Gerson (2020), on behalf of the OECD, states the need to develop public service capability by assuring that public services are "fit-for purpose, responsive and resilient" (p. 12). Thus, although probably in tension, compliance with rules and regulations and responsiveness as a consequence of openness and partnership with society, are constitutive elements of public services.

The tension between organizational elements can be usefully understood and managed using the ambidexterity approach, a well-established framework explaining organizational performance (Junni et al., 2013; Hughes, 2018; Haseeb et al., 2019). In general, ambidexterity describes the ability shown by organizations to manage the conflicting demands of exploration and exploitation (March, 1991). The tension comes from the very distinct nature of the organizing activities required to pursue exploitation (control, efficiency, uncertainty reduction) *versus* exploration (search, risk taking and discovery, innovation), which have to be reconciled to assure organizational performance (O'Reilly & Tushman, 2008). This can be achieved structurally, separating units devoted to exploration from those assuring exploration, or contextually, which corresponds to developing, within one specific organization or unit, the ability to be both aligned - all systems working efficiently towards the same goal - and adaptive - all work systems are able to reconfigure in response to environmental changes (O'Reilly and Tushman, 2013).

The appealing nature of ambidexterity has attracted the attention of researchers interested in explaining and improving public organizations' performance. For instance, Choi and Chandler (2015), in a theoretical proposition, suggested using the core ambidexterity concepts of exploration and exploitation to deepen understanding of public sector innovations. Using a case study design, Cannaerts et al. (2016) examined whether two public organizations have developed ambidextrous designs, a conclusion not supported by the data. Nunes et al. (2018) confronted contextual ambidexterity with service climate and identity strength as alternative explanations of public organizations' performance and found evidence

that these three variables were significant predictors of performance, with a tendency for contextual ambidexterity to predominate over the other two explanations. In a similar vein, Gieske et al. (2019) analyzed and found generalized empirical evidence of the relationship between three predictors of public organizational performance, namely connective capacity, learning capacity and ambidextrous capacity, a relationship mediated by the emphasis on innovating and optimizing. Resorting to a case study design, Magnusson et al. (2021) found evidence of several organizational practices enabling digital ambidexterity, although practices supporting exploitation are more frequent than those promoting exploration.

The theoretical consistency and growing empirical evidence provided by the ambidexterity approach, mainly the contextual view, as an explanation for the performance of public organizations calls for the use of a refined measurement tool. Although the original measure developed by Gibson and Birkinshaw (2004) has shown appropriate ability to predict the performance of public organizations, (Nunes et al., 2018; Gieske, et al. 2019), it uses two broad categories of alignment and adaptability, which requires both theoretical expansion and refined measurement.

### **1.2 Contextual ambidexterity in public organizations: refining the original dimensions of alignment and adaptability**

In theorizing the distinction between organizations belonging to public, private and non-profit sectors, Billis (2010) argues that public entities tend to show a configuration of characteristics: they are owned by citizens, governed as a consequence of public elections, emphasise public service and collective choice, which is provided by paid civil servants employed by an entity financed by taxes. In the same vein, emphasising highly socially shared and conventionalised governance mechanisms inherent to the three sectors, Seibel (2015) describes prototypical public organizations as being governed by the hierarchy of legal authority, which leads public managers to act on behalf of the public, but required to comply with legislation implemented through hierarchical processes.

These arguments elaborating on public organizations' specificities echo the results of the differences between public and private management found in the systematic literature review by Boyne (2002): public organizations are more bureaucratic, more permeable to environmental requirements and pursue more vague goals. The dual requirement of compliance with legal authority and responsiveness to changes in the environment calls for a specific management capacity, and contextual ambidexterity, representing the ability to conciliate alignment and adaptability, is this important determinant of organizational performance.

Despite the generic adequacy of contextual ambidexterity as an explanation for organizational performance, we suggest that the measure developed by Gibson and Birkinshaw (2004) needs improvement. Firstly, it is insufficient to grasp the above-mentioned features of public organizations, mainly the alignment component. Secondly, it fails to capture properly the requirements of effective adaptability. The original scale measures alignment with the items "The management systems in this

organization work coherently to support the overall objectives of this organization”, “The management systems in this organization cause us to waste resources on unproductive activities”, “People in this organization often end up working at cross-purposes because our management systems give them conflicting objectives”. The absence of sector-specific alignment mechanisms is clear. Following the above description of the specific feature of public organizations, we suggest that alignment is achieved by both second order and third order controls (Perrow, 1986). If first order control, corresponding to direct supervision, is a widespread coordination mechanism, the other controls are relevant as alignment mechanisms.

Second order controls represent the alignment effect of rules and routines (Perrow, 1986). Strategic managerial control theory (Simons, 1994) stresses the importance for alignment of the “the formal, information-based routines and procedures used by managers to maintain or alter patterns in organizational activities” (p. 170). In this sense, explicit limits and rules can contribute to formal alignment (Annosi & Brunetta, 2018).

Third order control aligns resorting to shared beliefs (Perrow, 1986), because it is a mechanism that operates by stressing the communality of beliefs among organizational members, thus facilitating mutual understanding and a common language (Burgers et al., 2009). The development of shared understandings leads organizational members to align with organizational purpose as a reference for priorities and performance (Annosi & Brunetta, 2018). Shared vision also captures the above-mentioned purpose and the common good driven nature of public organizations (Gerson, 2020).

Additionally, public organizations are usually established to last, and tend to institutionalise work process and characteristics that can persist for decades, in spite of ensuing environmental fluctuations, a process known as imprinting (Simsek et al., 2015). Imprinting encapsulates the effect of previous routines, which makes it an important alignment attribute based on the continuity of work processes. The literature on organizational identity stresses the relevance of nurturing the sense of organizational continuity, despite required changes arising from the expected evolution of all organizations (Glynn et al., 2015).

Although less limited, Gibson and Birkinshaw’s (2004) measure of adaptability also deserves consideration and expansion. The three items used to tap this dimension of contextual ambidexterity seem to have appropriate face validity, but they leave out important preconditions of this type of response to changing circumstances. Original items are “The management systems in this organization encourage people to challenge outmoded traditions/practices/sacred cows”, “The management systems in this organization are flexible enough to allow us to respond quickly to changes in our markets” “The management systems in this organization evolve rapidly in response to shifts in our business priorities”. It is clear that the scale emphasizes the flexibility of management systems.

In our view, the adaptability component of contextual ambidexterity is best described if we disentangle the willingness shown by an organization to adapt, or flexibility, from the conditions that precede this capacity. In line with strategic

learning theory (Crossan et al., 1999), we suggest that new organizational responses become materialised as a consequence of previous new idea generation and collective cognitive elaboration processes, which only happens in safe conditions. Thus, having an organization whose members do not fear to be disregarded or tracked by leaders and peers when they disagree, make mistakes or present an idea is a precondition to flexibility. This organizational attribute is known as psychological safety, and is well established in organizational theory (Edmondson, 1999; Garvin et al., 2019).

In addition to psychological safety, in order to benefit from appropriate and innovative solutions, organizations have to be generative in the sense that they set up recurrent reviewing and reflecting occasions, to stimulate collective understanding about possible required changes to objectives or work processes and to challenge people intellectually to come up with new ideas and act to test them (Weick & Sutcliffe, 2015). Regularly creating collective reflexive moments is a well-established individual and organizational learning activity (e.g. Harrison & Shortell, 2020) Along with the generalized sense of psychological safety, these reflexive spaces are preconditions for effective adaptive response.

Finally, although different concepts, in the original scale, alignment and adaptability are highly correlated, which deserves additional attention. At the business unit level, Gibson and Birkinshaw report a 0.49 correlation, but in the public context, Nunes et al. (2018) found a coefficient of 0.73, which can indicate the existence of one factor underlying both concepts.

In a nutshell, in line with the above-mentioned arguments, we propose to decompose the alignment component of contextual ambidexterity into the sub-dimensions of rule-following, shared vision and imprinting. In the same vein, we contend that the adaptability component is best described by the sub-dimensions of psychological safety, reflexive spaces and flexibility. We test these possibilities through scale development research.

## **2. Study 1. CASPO - initial construct validity**

### **2.1 Data gathering and sample**

We included the measures of alignment and adaptability in a questionnaire. Following a common procedure (Goodman et al., 2013), a research company recruited and administered the questionnaire using an online proprietary data gathering system. With the purpose of maximizing diversity, the population was defined as civil servants living in Portugal, with one or more years of tenure. A total of 200 completed questionnaires were obtained. On average, the civil servants surveyed were 47.80 years old (SD=8.04), 56.0% were female, and 19.0% performed supervisory functions. Average tenure was 17.25 years (SD=9.53).

## **2.2 Measures**

Once our theoretical propositions regarding the decomposition of both alignment and adaptability were formulated, we searched for existing measures of the six concepts representing the expanded view of contextual ambidexterity. The criteria for selecting measures were the conceptual correspondence to the included concepts and the validity of the respective measures reported by revision studies when available (e.g. Denison et al., 2014; Hartnell et al., 2011).

The alignment dimension encompasses the rule-following, shared vision and imprinting sub-dimensions. To measure rule-following, we used the FOCUS (van Muijen et al., 1999) scale of rules, as it emphasizes respect for authority, the compliance with established procedures and reliance on written communication. An example item is: “In this organization is typical compliance with rules”.

We measured the shared vision sub-dimension resorting to the Burgers et al. (2009) scale. The authors define this concept as an informal integrative mechanism based on the alignment of goals and values. An example item is: “People are enthusiastic about the collective goals and mission of the whole organization”.

We measured imprinting using the tradition scale of Patterson et al. (2004), who define this concept as the extent to which conventional ways of doing things are valued in one specific work context, thus mirroring our notion of imprinting. An example item is: “Senior management like to keep established, traditional ways of doing things”.

Adaptability includes psychological safety, reflexive spaces and flexibility. We used the measures of Edmondson (1999) and Garvin et al. (2019) as sources of items to measure psychological safety, defined by the authors as collective beliefs about an entity (team or organization) characterized by interpersonal trust and reciprocal respect where members can express who they are without inhibitions. An example item is “In this unit, it is easy to speak up about what is on your mind”.

The reflexive spaces sub-dimension was measured by the reflexivity scale of Patterson et al. (2004), defined as a systematic concern about reviewing existing goals, strategies and work processes with the purpose of changing them to adapt to required variations. An example item is: “The methods used by this organization to get the job done are often discussed”.

We measured flexibility using the creating change scale of Denison et al. (2006). This concept is defined as the ability shown by an organization to create adaptive ways to meet changing needs observed in the environment, to respond rapidly to new requirements and anticipate changes. An example item is: “The way things are done is very flexible and easy to change”.

Because the concept of contextual ambidexterity can be applied to the intra-organizational level of analysis, which is relevant considering the high internal differentiation characterizing most public organizations, we focused all questions at the work unit level. We also introduced slight changes in wording to fit the public context. In all items we used a seven-point rating scale (1= totally disagree and 7= totally agree).

### 2.3 Results

To aid in scale development, we used a multistage factor analysis strategy, as recommended by Brown (2014). We started the analysis by submitting our data to exploratory factor analysis, using principal component with varimax rotation, as we expect the six dimensions to be orthogonal. In line with the recommendations to use an item loading criterion of .40 (Ford et al., 1986), we excluded items that showed cross-loadings above this limit in more than one dimension, which led us to exclude four items from the initial 24. After this, we re-ran the analysis using the 20 retained items and tested two additional rotation techniques to determine if a different rotation would give an improved factor analytic solution for CASPO. The results are presented in Table 1.

**Table 1. Results of the exploratory factor analysis of CASPO items**

	F1	F2	F3	F4	F5	F6
Senior management like to keep established, traditional ways of doing things	0.768					
The way this work unit does things has never changed very much	0.763					
Changes in the way things are done here happen very slowly	0.699					
There is a total agreement on our work unit vision		0.828				
There is commonality of purpose in my work unit		0.662				
All organizational members are committed to the goals of this work unit		0.612				
People are enthusiastic about the collective goals and mission of whole work unit		0.581				
Is typical compliance with standards			0.801			
Is typical compliance with rules			0.791			
Is typical being procedures driven			0.771			
The methods used by this work unit to get the job done are often discussed				0.812		
There are regular discussions as to whether people in the work unit are working effectively together				0.731		
In this unit, objectives are modified in light of changing circumstances				0.614		
The way things are done is very flexible and easy to change					0.820	
We respond well to changes in the environment of this unit					0.723	
New and improved ways to do work are continually adopted					0.697	
Attempts to create change usually meet with resistance (reverse scored)					0.589	
In this unit, it is easy to speak up about what is on your mind						0.832
People in this unit are usually comfortable talking about problems and disagreements						0.798
People in this unit are eager to share information about what does and doesn't work						0.747
Variance explained (%)	27.05	14.84	9.53	8.71	7.51	6.89
Internal reliability (Cronbach's $\alpha$ )	0.76	0.79	0.80	0.74	0.77	0.78

(Source: own processing; Factor 1-imprinting; Factor 2-shared vision; Factor 3-rule-following; Factor 4-reflexive spaces; Factor 5- flexibility; Factor 6- psychological safety)



The findings indicate a clear factor structure, revealing that items supposed to measure theoretical dimensions load on the respective dimension. Overall, the three dimensions explain a significant amount of variance (74.53%). As shown in Table 1, internal reliability reaches appropriate levels (Cronbach's  $\alpha$  ranging from 0.74 to 0.80).

### **3. Study 2. Confirming CASPO's construct validity and testing its predictive validity**

#### **3.1 Data gathering and sample**

Data were gathered using the same procedure as in Study one. Again, 200 diverse civil servants were involved. The mean age was 47.37 years ( $SD=8.77$ ) and 54.0% were male. With a mean tenure of 16.93 years ( $SD=8.83$ ), 17.0% of the sample had supervisory roles.

#### **3.2 Measures**

We used the initial version of the CASPO scale from Study one to measure the six dimensions of contextual ambidexterity. As a criterion variable, we measured organizational performance using the Gibson and Birkinshaw (2004) four-item scale. A sample item is: "This work unit is achieving its full potential". In our sample, internal reliability of this scale is adequate ( $\alpha=0.82$ ). Because we wanted to obtain data to test the predictive validation of the CASPO with sensitivity to the public sector context, we used van Loon's (2016) scale of perceived work unit performance for public entities, a measure that asks respondents to rate their work-unit performance in 14 elements using a 7-point rating scale (1= bad; 7= excellent). A sample item is: "Contribution to wellbeing of citizens". Internal reliability is high ( $\alpha=0.92$ ).

#### **3.3 Results**

As exploratory analysis produced initial evidence about CASPO's construct validity in Study one, we carried out confirmatory factor analysis on the same set of items to gather additional evidence of CASPO's dimensionality. We tested two models. In the first, all items were used as indicators of one latent variable. In the second model, items were specified as indicators of the respective factors. Because a model's fit cannot be determined by a single index, we used a set of fit indices (Cheung & Rensvold, 2002): SRMR (standardized root mean square residuals); RMSEA (root mean square error of approximation); CFI (comparative fit index) and TLI (Tucker-Lewis index or NNFI, non-normed fit index). Table 2 contains the results of this analysis.

The one-factor model produces unacceptable results ( $SMRM=0.09$ ;  $RMSEA=0.10$ ;  $TLI=0.83$ ;  $CFI=0.84$ ), which leads us to reject the possibility of all

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items capturing only one undifferentiated underlying dimension. The fit indexes describing model 2 (SMRM=0.04; RMSEA=0.06; TLI=0.92; CFI=0.93), reach acceptable thresholds, indicating that a six-dimension solution fits the data obtained. The internal reliability of the scales confirms the adequacy identified in Study 1, with Cronbach's  $\alpha$  ranging from 0.77 to 0.84 (Table 2).

**Table 2. Results of confirmatory factor analysis of CASPO items**

	F1	F2	F3	F4	F5	F6
Senior management like to keep established, traditional ways of doing things	0.695					
The way this work unit does things has never changed very much	0.799					
Changes in the way things are done here happen very slowly	0.606					
There is a total agreement on our work unit vision		0.749				
There is commonality of purpose in my work unit		0.818				
All organizational members are committed to the goals of this work unit		0.788				
People are enthusiastic about the collective goals and mission of whole work unit		0.787				
Is typical compliance with standards			0.862			
Is typical compliance with rules			0.870			
Is typical being procedures driven			0.807			
The methods used by this work unit to get the job done are often discussed				0.805		
There are regular discussions as to whether people in the work unit are working effectively together				0.726		
In this unit, objectives are modified in light of changing circumstances				0.905		
The way things are done is very flexible and easy to change					0.840	
We respond well to changes in the environment of this unit					0.874	
New and improved ways to do work are continually adopted					0.895	
Attempts to create change usually meet with resistance (reverse scored)					0.776	
In this unit, it is easy to speak up about what is on your mind						0.725
People in this unit are usually comfortable talking about problems and disagreements						0.820
People in this unit are eager to share information about what does and doesn't work						0.800
Internal reliability (Cronbach's $\alpha$ )	0.77	0.80	0.85	0.81	0.84	0.79

(Source: own processing; Factor 1-imprinting; Factor 2-shared vision; Factor 3-rule-following; Factor 4-reflexive spaces; Factor 5- flexibility; Factor 6- psychological safety. )

In order to examine CASPO's criterion variable, we regressed CASPO's dimensions against two different measures of perceived organizational performance: Gibson and Birkinshaw's (2004) scale, a generic measure; van Loon's (2016) scale, a measure created for the public sector context. Table 3 contains the results of this analysis.

The results show that CASPO's dimensions explain a significant amount of the variance of both generic and public unit performance measures ( $R^2=0.60$ ,  $p<0.01$  and  $R^2=0.48$ ,  $p<0.01$  respectively), thus supporting the criterion validity of the scale.

We also used sample 2 to collect data about Gibson and Birkinshaw's (2004) measure, and the proportion of variance explained by this scale is lower ( $R^2=0.54$ ,  $p<0.01$  and  $R^2=0.34$ ,  $p<0.01$  respectively for generic and public performance) than the amount explained by CASPO.

**Table 3. Testing CASPO's criterion validity**

	Generic unit performance <sup>a</sup>	Public unit performance <sup>b</sup>
Rule-following	0.15*	0.20**
Shared vision	0.65**	0.38**
Imprinting	-0.18**	-0.17*
Psychological safety	0.15*	0.07
Reflexive spaces	0.13	0.15*
Flexibility	0.18**	0.17*
R <sup>2</sup>	0.60**	0.48**
F	45.16**	27.78**

*(Source: own processing. Standardized coefficients are presented; n=200; \*p<0.05; \*\*p<0.01. <sup>a</sup> Gibson and Birkinshaw (2004); <sup>b</sup> van Loon, 2016.)*

Despite the evidence of predictive validity, the relationship between CASPO's dimensions and criterion variables is not homogeneous. Shared vision shows the strongest relationship with both performance criteria ( $\beta=0.65$ ;  $p<0.01$  and  $\beta=0.38$ ;  $p<0.01$  respectively for generic and public unit performance). Rule following is also significantly related to both performance measures ( $\beta=0.15$ ;  $p<0.05$  and  $\beta=0.20$ ;  $p<0.01$  for generic and public unit performance, respectively), a pattern of results observed also with flexibility ( $\beta=0.18$ ;  $p<0.01$  and  $\beta=0.17$ ;  $p<0.05$  for generic and public unit performance, respectively). In the same vein, although negatively, imprinting is related to generic unit performance ( $\beta=-0.18$ ;  $p<0.01$ ) and public unit performance ( $\beta=-0.17$ ;  $p<0.05$ ). Psychological safety only significantly predicts generic unit performance ( $\beta=0.15$ ;  $p<0.05$ ), while reflexive spaces is significantly related only to public unit performance ( $\beta=-0.15$ ;  $p<0.05$ ). Thus, all CASPO's dimensions show predictive ability of at least one type of criterion.

#### **4. Conclusion**

The overarching goal of this research was to provide initial validity evidence of CASPO, as a new measure of contextual ambidexterity, conceptually more comprehensive and sensitive to some specific features of public organizations. Overall, empirical evidence supports a measure of contextual ambidexterity that expands the original two dimensional concept (alignment and adaptability) to six related dimensions, three measuring alignment (rule-following, shared vision and

imprinting) and two assessing adaptability (psychological safety, reflexive spaces and flexibility).

Compared to the existing scale (Gibson and Birkinshaw, 2004), from a research perspective, CASPO considerably expands the meaning of contextual ambidexterity, maintaining its original meaning of the ability to embrace a duality opposing alignment and adaptability as antecedents of higher performance. The new dimensions added to measure adaptability and alignment capture important characteristics of public organizations and are significant predictors of unit level perceived performance.

From a development standpoint, when used for diagnostic purposes, CASPO can provide more detailed information about the dynamics of specific units, identifying higher or lower scores in some of the six independent variables, thus allowing more fine-tuned intervention strategies. For example, instead of simply recommending improving adaptability, to build psychological safety and create reflective spaces, there can be more precise, tangible recommendations to achieve the same end goal.

Our research has important limitations. Although it provided initial support for the construct and criterion validity of a new contextual ambidexterity scale using two samples of Portuguese civil servants, samples from other countries could generate information about the structure invariance of the six-dimension solution. In the same vein, public administration is highly differentiated, and more purposeful sample strategies could reveal or challenge the structure we found. In fact, the required change imposed upon different public organizations is not the same, and the same applies to different units within the same organization, which makes this requirement an important moderator variable. In practice, both researchers and practitioners should be sensitive to the broader context in which a specific unit operates, which can be a substantial aid in interpreting results.

Furthermore, we used perceptible measures for the criterion variables. Although this type of measure is relevant and reliable (Andrews et al., 2006), other indicators (e.g. archive data), and stakeholders (e.g. citizens) could be used as measures of unit performance and expand the predictive value of CASPO. The level of analysis should be the unit, a natural progression path for the validation of CASPO.

Besides addressing these limitations, future research could examine a richer scenario of nomological validity of the new measure. Our approach was focused on construct and criterion validity, which leaves room for further research investigating the antecedents of CASPO's dimensions. Gibson and Birkinshaw (2004) suggest that contextual ambidexterity is built under the influence of a management context that includes a strong emphasis on both performance management and social support, recovering the classic two-dimension leadership approaches including people or task oriented behaviors (Yukl & Gardner, 2020). Nunes et al. (2021) also stress the role of leadership and provide empirical evidence about the role of transformational leadership in influencing museums' performance, a relationship moderated by contextual ambidexterity, which gives a distinct light to contextual ambidexterity's

antecedents. Future research could follow this line of thinking and paradoxical leadership (Zhang et al. 2015) seems promising because it explicitly includes dimensions of leadership connected to ambidexterity, namely maintaining decision control *while* allowing autonomy and enforcing work requirements *while* allowing flexibility. In general, this path of research is consistent with the suggestions formulated by Uhl-Bien and Arena (2018), according to which leadership for organizational adaptability is becoming a distinctive approach.

#### **Authors Contributions**

The authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

#### **Conflict of Interest Statement**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Scale development and initial evidence**

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