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Abstract

The purpose of this article is to address the issues of validity and reliability in existing additive indices measuring the strength of executives. Many data efforts, such as Frye et al. (2000) as well as Armingeon and Careja (2007), propose indices of presidential power based on a simple accumulation of a set of individual constitutional prerogatives allotted to the head of state according to the design proposed by Shugart and Carey (1992). These indices usually gather and count the powers of presidents on package and partial vetoes, decrees, budgetary powers, referenda provisions, initiation of legislation, cabinet formation, cabinet dismissal, censure, and the dissolution of assemblies. Despite the general acceptance of such measures of presidential power and their widespread use, empirical investigations to ascertain the degree to which existing indices measure a single latent construct, and are valid and reliable, were never conducted. In this article, I refute the assumptions of unimodality and unidimensionality underlying these indices, and challenge their usefulness in allowing researchers to differentiate between presidential, semi-presidential, and parliamentary institutional arrangements.

Keywords

presidential powers, composite indices, measurement validity, institutions, methodology

1. Introduction

Schemes to classify and measure executive strength are widespread in the literature on formal political institutions (Baylis, 1996; Cheibub, 2007; Derbyshire and Derbyshire, 1996; Duverger, 1980; Easter, 1997; Elgie, 1998; Frye, 1997; Frye et al., 2000; Golder, 2005; Hellman, 1996; Krouwel, 2003; Lucky, 1993–94; McGregor, 1994; Metcalf, 2000; Sartori, 1997; Shugart and Carey, 1992; Stepan and Skach, 1993). While much theoretical work was invested in designing these tools for measurement, most contributions emphasize the theoretical validity of individual indicators (Krouwel, 2003; Metcalf, 2000) or stress the importance of specific items such as decree

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powers, veto powers, or the power to make corrective 'observations' after a veto override (for example, Carey and Shugart, 1998; Protsyk, 2004; Shugart and Haggard, 2001; Tsebelis and Rizova, 2007). Despite this scholarly attention, no systematic empirical investigations have been conducted on the methodological aspects of composite indices of presidential power, for instance, on the significant issues of validity and reliability. In the present article, I intend to address this shortcoming by examining three frequently used indices of presidential power. The article will address questions such as the following: What are the rules for the establishment of a measurement of presidential prerogatives? Do all presidential powers vested in constitutions map a single latent construct? More simply, should we even build a composite index? Given how common the use of these indices as independent variables in various research projects has become, it is now crucial to begin examining their quality more systematically.

The demonstration will be conducted in three sections, and will focus on two main families of measurement. First, I will look at Shugart and Carey's measurement from *Presidents and Assemblies* (1992), together with Frye, Hellman, and Tucker's *Data Base on Political Institutions in the Post-communist World* (2000). Second, I will turn to the *Comparative Data Set for 28 Post-communist Countries, 1989–2007* by Armingeon and Careja (2007). For each measurement family, I will perform correlation or association analyses between the items; this first set of analyses makes it possible to evaluate the level of validity of the chosen indicators as reflections of the larger concept of presidential power. If all indicators retained measure a single latent construct, they should display high inter-item correlation coefficients, and strong correlations with the composite index. To complement these analyses and to evaluate the potential validity and reliability of an index of presidential power, I will employ factor analyses to reduce the number of indicators to a set of unobserved factor(s) that are the product of common causal influences. As a last step, building on the results from the exploration of the datasets, I will propose alternative measurements focusing on a selection of core presidential powers.

The findings of the article are twofold: (1) most existing measurement schemes are low in validity and reliability, such that single indicators hypothesized to capture the concept of presidential power do not seem to matter equally in accounting for composite scores; (2) in their original form, none of the measurement schemes under examination are unidimensional, meaning that all items pertain to a single latent construct. Consequently, researchers should exercise caution when using these tools. Since the population of potential cases is limited, robust empirical testing of indices containing many items is practically impossible. Given these difficulties, it is perhaps more efficient to rely on a limited set of items that we know are valid and reliable, rather than opt for exhaustive measures which may contain indicators that pertain to different latent constructs and reduce the overall quality.

2. Methods of measuring presidential power and data

Methods of measuring presidential power generally command more consensus than most other aspects of macro political science. In general, contributors focus on the formal prerogatives of presidents, such as those included in constitutions. Very few methods, if any, systematically consider informal aspects of presidential power outside the flourishing literature on the American presidency.[1] The reason is doubtless that this aspect of authority is more difficult to quantify and offers little hope of comparability across different groups of countries. Therefore, most of the unresolved debate in the literature focuses on which powers should be considered as defining features, rather than on a comprehensive approach to capturing the concept of executive strength.

Surveying the literature on existing methods of measuring constitutionally vested presidential power, I encountered two slightly different strategies. The first, and most authoritative method employed, was formulated by Shugart and Carey (1992), later modified by Metcalf (2000) and also used in *'Data Base on Political Institutions in the Post-communist World'* by Frye et al. (2000). In this measurement frame, the powers of popularly elected presidents are evaluated in 10 discrete categories, each of which is rated on a scale ranging from 0 to 4. This method of evaluating prerogatives makes it possible to discern finer distinctions. The measurement scheme can be further disaggregated in two parts. The first part contains legislative powers, that is, constitutional prerogatives allotted to the president in the legislative process. Does the president have package or partial veto powers, decree authority, and the prerogative for exclusive introduction of legislation in reserved policy areas? How extensive are the president's budgetary powers and the possibility of proposing referenda? In turn, non-legislative powers concern cabinet formation and dismissal, the possibility of censure, and lastly, the prerogative to dissolve the legislature. Researchers generally use two additive indices from these scores, an index of legislative powers and an index of non-legislative powers, weighting each dimension equally and summing up across all 10 variables to create an overall index of presidential power.

The second approach to measurement consists of an inventory of formal prerogatives, as originally proposed by Duverger (1978). Since then, several contributors have proposed measurement schemes that are more or less comprehensive lists of presidential powers, scoring 1 if the president holds the power in question and 0 if not, and then summing up these scores. Recently, Siaroff (2003) put forward a parsimonious additive index of 9 powers (coded 1 or 0) of directly elected presidents that is gaining in popularity. At the more expansive end of the continuum, Frye (1997) and Lucky (1993–94) proposed lists comprising 27 and 38 presidential powers, respectively, to rank presidents in former communist countries. While Shugart and Carey (1992) and Siaroff (2003) concentrate on popularly elected presidents, some other measurement schemes consider a broader distribution of regime types, but weight items differently depending on whether the president is directly or indirectly elected. One prime example is the *Comparative Data Set for 28 Post-communist Countries, 1989–2007* by Armingeon and Careja (2007). The measurement is built from a comprehensive list of 29 presidential powers (some of which overlap with items considered by Shugart and Carey (1992)), which are allotted equivalent influence in an additive index.

Having presented the most commonly employed measurement schemes, we can draw some conclusions about the shared assumptions and areas of agreement of these two approaches. All in all, a majority of researchers believe that the most important prerogatives of presidents are numbered between 9 and 38. In addition, since every measurement scheme proposes a form of additive index, it could also be argued most consider that (1) all powers are equally relevant; (2) all powers co-vary in the same direction; and last, (3) all powers belong to a single latent construct. However, as I will demonstrate in the following section, these composite indexes offer murky measurements at best.

3. Quantitative assessment of composite presidential power indices

Despite the strong theoretical reasoning justifying the choice of individual indicators of presidential power for the making of a composite measure, the impact of the methodological choices made during the development of each index has rarely been evaluated empirically. This is a major shortcoming. Such an omission is startling given that all usages of presidential power measures

have been in the form of a composite index, rather than in the guise of individual features or a combination of certain features in a series of dimensions composing the larger phenomenon of presidential power. Contributors have used these indices in quantitative analyses without knowing if they were measuring this key feature of political systems reliably. Substantively, this means that researchers have aggregated a set of indicators without knowing whether they were associated, if this association was in the same direction, and, finally, whether each component has an equal weight. In brief, there is scant empirical support offered for the particular weighting scheme that is selected. These problems make it crucial to assess the quality of available measurements.

A common situation that makes the building of an index necessary occurs when researchers face a set of items that measure a given set of phenomena whose effects are so closely associated that they cannot be used separately in a multivariate analysis. When building such indices, the most important property of measurement is validity. Broadly stated, validity refers to whether a measuring instrument actually measures what it is calibrated to measure in the context in which it is to be used, or more precisely, 'the extent to which differences in scores on a measure reflect *only* differences in the distribution of values on the variable we intended to measure' (Manheim et al., 2005: 76). In addition to being valid, a measurement scheme must also be reliable, that is, the set of items selected should measure the target concept consistently and proportionately measure a mostly true score (internal consistency).

To evaluate the potential validity and reliability of the various indices included in this article, I employ two methods. First, I use correlational analyses to confirm that the differences in country scores for the various indicators are mirrored in a similar way across items. This type of analysis enables us to evaluate the level of validity of the chosen indicators as reflections of the larger concept of presidential power. If the measures selected represent a single concept, all items should be closely linked to each other in a manner that is internally consistent (one of the necessary conditions of construct validity). Each of the items should also be correlated with the composite index, since variations in items that are not explained by the larger concept are potential sources of systematic measurement error. Next, I perform exploratory factor analyses (EFA) and parallel analyses (PA) to reduce the number of items to those which share a common causation pattern.

3.1. Shugart and Carey and Frye, Hellman, and Tucker

Since the index of presidential power proposed by Shugart and Carey (1992) is based on the aggregation of items from two theoretically distinct dimensions of power, I propose to look at correlation patterns in each dimension separately and also to examine the correlation of each item with the total index. If presidential powers are really distributed according to a two-dimensional map of 10 variables, we should see all items clearly and highly correlated in two separate clusters. Table 1 below presents a correlation matrix between the 10 measures chosen by the authors, as well as with the composite score.[2] For this exercise, I have pooled Shugart and Carey's as well as Frye, Hellman, and Tucker's groups of countries together, keeping a single case of overlapping countries, I then ran two analyses, one containing all available valid cases (62) and one removing authoritarian regimes (47 cases).[3] Although they are interesting cases, the stable autocracies included in both datasets might provide a different kind of insight in evaluating the effects of formal institutional design, such as presidential powers. Wherever relevant and possible, I judge it more prudent to examine their effects separately.

Looking at Table 1, we notice the absence of a clear pattern of correlations among the institutional features in the first dimension termed 'Legislative powers'. In the words of Shugart and Carey (1992: 131): 'one of the defining criteria of presidentialism is that the president possesses

Table 1. Correlation Matrix between 10 Indicators of Presidential Power

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1]	1*										
[2]	0.28*	1*									
[3]	0.17	0.15	1*								
[4]	0.17	0.54*	0.11	1*							
[5]	0.21	0.28*	0.01	0.63*	1*						
[6]	–0.25*	−0.07	0.22	−0.03	−0.15	1*					
[7]	0.27*	0.40*	0.20	0.31*	0.14	−0.08	1*				
[8]	0.54*	0.43*	0.10	0.29*	0.33*	−0.19	0.74*	1*			
[9]	0.54*	0.42*	0.09	0.32*	0.32*	–0.34*	0.50*	0.58*	1*		
[10]	–0.26*	–0.35*	−0.01	−0.18	−0.19	0.16	−0.04	−0.18	–0.38*	1*	
[11]	0.58*	0.60*	0.42*	0.52*	0.43*	0.03	0.77*	0.82*	0.66*	−0.05	1*

Notes:
Legislative powers
Variable 1: Package veto
Variable 2: Partial veto
Variable 3: Decree
Variable 4: Exclusive introduction of legislation
Variable 5: Budget
Variable 6: Referenda
Non-legislative powers
Variable 7: Cabinet formation
Variable 8: Cabinet dismissal
Variable 9: Censure
Variable 10: Dissolution of assembly
Total
Variable 11: Total composite score
* = significant at the 0.1 level (two-tailed).
Table 1 excludes authoritarian countries.
Sources: Shugart and Carey (1992), Frye et al. (2000).

some legislative power'. According to the authors, this is accomplished by evaluating how much legislative authority presidents are granted in constitutions in terms of veto powers, decree powers, prerogatives related to the exclusive introduction of legislation, budgetary powers, and the powers to call referenda. However, the assumption that these items are additive was never tested empirically. Testing whether aggregation is advisable, correlation patterns presented in Table 1 suggest the negative.

There are few positive and significant correlation coefficients between the six items theorized to be part of the dimension of legislative powers, which in turn suggests that only a few indicators seem to be valid representations of the larger concept.[4] Only 4 out of 15 bivariate correlations present significant and positive coefficients. In particular, package veto and partial veto prerogatives are positively associated, while a partial veto is associated with both powers of the exclusive introduction of legislation in certain policy domains and budgetary powers (both of which are correlated). Also, decree powers are not linked with any other item in this dimension, while referenda-initiation powers are even negatively associated with all the other items (although only a single coefficient is statistically significant). These results run counter to the logic of additive index building: items should co-vary in the same direction.

Given that the veto (and its variations) are presidents' 'most consistent and direct connection with the legislative process' (Shugart and Carey, 1992: 134), the fact that there are few significant correlation coefficients between these indicators and the remaining items of this dimension is disturbing. Close inspection of the bottom portion of Table 1 reveals more frequent and stronger associations between veto items (package and partial) and between items from the non-legislative powers dimension, such as cabinet formation, dismissal, and censure. Within the dimension of legislative powers, five of the six indicators retained present positive and significant correlation coefficients with the total index of presidential power: the item for proposal of referenda is not correlated with the composite index, and even presents statistically significant negative correlation coefficients with package veto powers and censure. Therefore, the power of presidents to propose referenda, whether restricted by legislative assent or not, does not seem to be part of the same construct as the other items.

While the dimension of legislative powers offers little empirical evidence of the internal consistency of items, the dimension of non-legislative powers presents much stronger inter-item correlations. The right-hand side of Table 1 indicates the correlation coefficients for four measures of non-legislative powers, and for the total aggregated index. Clearly in this table, the indicators measuring the powers related to cabinet formation, cabinet dissolution, as well as censure are all strongly, and positively, correlated. Presidents having one of these prerogatives are more likely to have the others as well; for instance, presidents that appoint cabinets also very likely hold powers of cabinet dismissal. This part of Table 1 illuminates the necessity of building an index, since the linkages between individual items would make it difficult to use them separately in multivariate analyses, with one caveat. Despite these clearer patterns for non-legislative powers, one item in this dimension presents no positive association with any of the other prerogatives: powers of dissolution of the legislative assembly. What is more, this item even presents negative correlation coefficients with powers of censure, as well as package and partial veto powers. Shugart and Carey attribute higher scores to presidents who are permitted to dissolve the assembly at any time, and attribute less points as the restrictions to this prerogative increase, the rationale being that stronger presidents are more likely to have unrestricted powers of dissolution over the legislative assembly (1992: 154). While this logic is compelling in theory, it becomes clear in examining Table 1 that this item pertains to a different construct than the other aspects of non-legislative powers, and therefore should be excluded from an additive index in which unidimensionality is the goal. These findings suggest that certain combinations of powers are not likely in practice. It seems that presidents equipped with assembly-dissolution powers are less likely to hold other powers, such as cabinet formation or dismissal, while presidents holding referenda powers are less likely to possess any other legislative prerogative.

To further assess the degree to which the elements selected measure the phenomenon of executive power consistently, I have also performed EFA. Ideally, the number of factors obtained should represent the two qualitatively distinct constructs that conform to the theory outlined by Shugart and Carey, that is, legislative and non-legislative powers. Using the Guttman-Kaiser criterion (Guttman, 1954; Kaiser, 1960, 1961), I retained only those factors with eigenvalues greater than 1, which in the present case yielded a single factor.[5] Factor loadings of the retained factor are exhibited in Table 2. From the results presented in Table 2, it is obvious that the data do not conform to the two-dimensional operational concept of executive power with respect to legislative and non-legislative prerogatives: 7 out of 10 indicators cluster in a single factor, with no evidence of separate latent constructs for legislative and non-legislative powers.

The absence of empirical support for the two-dimensional map of presidential power raises serious concerns about using the index as a valid and reliable measurement in empirical analyses.

Table 2. Factor Loadings of 10 Indicators of Presidential Power

Items	Factor 1
Legislative powers	
Package veto	0.58
Partial veto	0.64
Decree	0.17
Exclusive introduction of legislation	0.59
Budget	0.51
Referenda	−0.24
Non-legislative powers	
Cabinet dismissal	0.68
Cabinet formation	0.82
Censure	0.74
Dissolution of assembly	−0.36

Notes: Table excludes authoritarian countries, for a total of 47 cases.
Minimum eigenvalue set at 1.
Factor loading cutoff normally set at .4 (Hair et al., 1998).
Sources: Shugart and Carey (1992), Frye et al. (2000).

Despite the strong theory underpinning component selection, the distribution of presidential prerogatives in existing constitutions coupled with the use of an ordinal scoring system probably explain much of the weak association patterns uncovered here. The aggregation of items that are not, or are only weakly related to each other and to the wider concept serves to undermine both the validity and reliability of the final measure. Each indicator is not necessarily associated in a robust manner with high levels of executive power, assuming that the factor solution identified represents this concept. Still, a strong case can be made that the powers related to partial and package vetoes, the exclusive introduction of legislation, cabinet formation, cabinet dismissal, and censure all belong to a single construct that could be called 'presidential power'. However, three items (decree powers, the introduction of referenda, and dissolution of the assembly) exhibit too much independence to be linked to the above factor solution and should be used as separate variables in empirical models in which these features are thought to be relevant. By using the more independent components of presidential power separately in analyses, researchers stand to gain a much clearer grasp of the effects of specific powers than by using an index in which the effects of some items are diluted by being combined with unrelated indicators.

3.2. Comparative Data Set for 28 Post-communist Countries, 1989–2007

The Comparative Data Set for 28 Post-communist Countries, 1989–2007 by Armingeon and Careja (2007) proposes an index of presidential powers based on 29 constitutional prerogatives that can potentially be allotted to presidents. Although the study focuses on 28 countries, it comprises a total of 33 observations.[6] Rather than proposing a two-dimensional construct of presidential power as in Shugart and Carey (1992), Armingeon and Careja (2007) offer a single continuum which is constructed by cumulating constitutional prerogatives. The 29 powers under consideration are assigned equal weight in the construction of the index. In all countries considered in this dataset, each individual power is coded as 1 if the president holds it exclusively, 0.5 if the president shares

that power with another body, and 0 if the president does not hold the prerogative in question. In the cases of indirectly elected presidents (Albania in 1991 and 1998, the Czech Republic, Estonia, Hungary, Latvia, Moldova after 2000, and Slovakia), the authors multiply the final composite score by a value of 0.5. This weighting scheme leaves us with two sets of scores: the original three-point ordinal notation and a weighted version that may contain between three and five categorical values for each item. As in the previous measurements, there is an implicit assumption of equal distance between categories, an assumption that remains untested.

In order to perform a preliminary inspection as to how the unweighted items are linked, I have performed a series of bivariate cross-tabulations and report Kendall's Tau b (τb) measure of association between each pair of items in Table 3. Using a liberal cut off point for χ^2 (that is, 0.1), the pairs of items that produce statistically significant associations are marked with a *. In this table, some 25 percent of pairs present positive and significant associations, while 5 percent present negative, significant associations. In other words, about 75 percent of pairs are either not associated or are linked in a direction that runs counter to the logic of additive index construction, whereby holding a constitutional power should boost the overall presidential power score. Close inspection of Table 3 reveals that here, as well, some powers have little in common with other items: the power to dissolve parliament (1) (as was also the case in the previous section), the power to call elections (3), the power to appoint senior officers (12), whether the president is the commander in chief of the armed forces (14), whether the chief executive chairs the national security council (15), whether he or she participates in parliamentary sessions (24), whether the leader has the prerogative to convene cabinet sessions (26), and participates in the cabinet (27). Perhaps more importantly, and unexpectedly, two indicators exhibit a high number of negative and significant coefficients with other items which in theory, at least, should describe strong presidents. These items are whether a president has special powers if parliament is unable to meet (22), and whether the president appoints the prime minister (4).[7]

Examining inter-item associations between weighted items (reducing the score of each item by half in the countries where a president is indirectly elected) might elucidate why the researchers sought to aggregate a group of seemingly unrelated indicators into a single composite measure. Table 4 presents Spearman's ρ correlation coefficients between all 29 weighted indicators. Again using the same liberal interpretation of statistical significance, the pairs of items that produce significant associations are marked with a *. Looking at Table 4, it is evident that halving the scores of 8 out of 33 cases produces massive effects on the patterns of association in the data. This weighting procedure increases the degree of significant associations between items from 25 percent to more than 70 percent.[8] A large number of items now appear to measure some aspects of a shared construct. Yet, some of the same items as those in Table 3 present a number of insignificant coefficients with most other indicators of presidential power: the power to dissolve parliament (1), to appoint senior officers (12), special powers if parliament is unable to meet (22), whether he or she participates in parliamentary sessions (24), and the prerogative to convene cabinet sessions (26). Given that these factors are not associated with most other factors, no matter which weighting scheme is employed, their inclusion in a composite index reduces the validity of the final measure.

Despite the marked improvement in correlation patterns, it remains unclear why the creators of this measurement scheme decided to reduce the scores of indirectly elected presidents by a factor of 0.5. The decision is all the more puzzling since the coding scheme already accommodates instances in which presidents share certain powers with another body. It is worthwhile to ask if, substantively, the influence of a president exclusively holding a prerogative is reduced by half if a president is indirectly elected. Considering that the effect of direct elections on presidential power is an area that has recently been characterized as a theoretical void, where 'the differences in the functioning of the regime resulting from direct elections are assumed rather than tested' (Tavits,

2009: 6–7), this decision is debatable. To visualize the effect of weighting the items, Table 5 presents a ranking of countries by presidential power in both weighted and unweighted versions of the data. The result of the weighting is simply a shift of Latvia, Albania, Estonia, Czech Republic, Slovakia, and Hungary from their initial positions, where their scores are roughly equal with those of parliamentary systems, to systematically much lower scores. The weighted version of the data yields rankings that contradict findings from previous studies, in which the nominal powers of indirectly elected Eastern European presidents were not found to be weaker than those of their elected counterparts (Metcalf, 2002).

To present further the consequences of this weighting graphically, Figure 1 displays a Kernel density plot of total unweighted scores. The curve representing the overall distribution closely follows a normal distribution. However, turning to Figure 2, which displays a similar plot of weighted scores against a normal distribution, we observe a different pattern. Once weighted, very few middle-range scores on the presidential power index remain. Figure 2 makes clear that the weighted index is no longer normally distributed, but in fact displays a bimodal distribution, with clusters of cases on both the high and low ends of the potential spectrum. The peak of the graph no longer corresponds to the most typical value, but to one of the least typical values.

In public opinion research, bimodal distributions generally indicate that there are serious disagreements within the sample, or that we are facing two different demographic groups, which could here be presidential and parliamentary regimes. If we hypothesize that semi-presidential regimes should theoretically receive middle-range scores, and keeping in mind that our sample is mostly composed of these types, the end items should be normally distributed. Bimodality in these cases is thus a disturbing discovery, since it points to the fact that the index is a mixture of two overlapping distributions, whose underlying influences were introduced by the weighting scheme using direct elections as a discrete cutoff. Substantively, given that semi-presidentialism is indeed a mixed type of presidentialism and parliamentarianism, we could therefore posit that semi-presidential regimes inevitably will lean to either side. While this hypothesis is appealing in theory, in practice, bimodality is a non-monotonic departure from the normal distribution that is difficult to accommodate in ordinary least square (OLS) regression models (violation of Gauss-Markov assumptions).

Because of the large number of items representing presidential power, the small sample of cases on which to perform analyses, and the categorical coding of the variables between three and five values, conventional EFA or confirmatory factor analyses (CFA) at this stage are bound to produce unstable solutions. For this reason, I employ the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to verify if the strength of the relationship among variables is large enough to justify performing factor analyses in both versions of the dataset. The higher the score (ranging between 0 and 1), the more the variables have in common. The overall KMO measure of sampling adequacy is 0.23 for the unweighted data and 0.56 for the weighted data.[9] Removing items (1), (3), (12), (22), (24), and (26) in the unweighted data helps boost the KMO measure to the minimum acceptable level (0.57) in order to perform a factor analysis.[10]

Given the ordinal nature of the items, I used Horn's Parallel Analysis for principal components (PA Monte Carlo) using 5000 iterations to select the number of retained factors rather than the Guttman-Kaiser rule (Hayton et al., 2004; Horn, 1965).[11] In the case of the unweighted data, a single factor was retained, accounting for 38 percent of the variance. By contrast, two factors were retained in the weighted data, accounting for 48 percent and 9 percent of overall variance, respectively.[12] Table 6 presents the rotated factor loadings in the two versions of the dataset of Armingeon and Careja (2007) side by side. Factors (rotated, where applicable) with loadings greater than 0.60 in absolute value were considered 'dominant' in those cases in which there were no significant cross-loadings on a different factor, while loadings less than 0.40, or negative, were left blank to ease interpretation.

Table 3. Patterns of Association between 29 Unweighted Constitutional Powers in 28 Post-communist Countries

Constitutional power	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1 Dissolves parliament																												
2 Calls referendum	.14																											
3 Calls elections	.65*	.11																										
4 Appoints prime minister	.05	.00	.15																									
5 Appoints ministers	−.08	.23	−.19	−.10																								
6 Appoints constitutional court	−.06	.07	−.14	−.45*	.17*																							
7 Appoints supreme court	−.14	−.03	−.06	.01	.58*	.46*																						
8 Appoints judges	−.30	.19	−.06	−.08	.64*	.14*	.52*																					
9 Appoints prosecutor general	−.11	.11	−.24	−.18	.60*	.32	.56*	.49*																				
10 Appoints senior central bank chief	−.19	.32*	−.07	−.22	.47*	.39*	.44*	.59*	.32*																			
11 Appoints security council	−.20	.29	−.18	−.05	.47*	.34	.36	.29	.51*	.46*																		
12 Appoints senior officers	.08	.10	−.21	−.34*	.13*	.23	−.22*	−.14	−.13	.06	.07																	
13 Appoints senior commanders	−.08	.42*	−.09	−.22	.35	.26	.23	.23*	.44	.38*	.49*	.18																
14 Commander in chief of armed forces	−.21	.16	−.19	−.11	.28	−.14	−.04	.18	.13	.15	.25	.10	.34															
15 Chairs national security council	−.21	−.10	−.21	−.01	.17	−.04	−.09	.15	.17	.07*	.39*	.22	.01	.32														
16 Remands law	−.32	.23*	−.25	−.09	.60*	.28	.53*	.69*	.65*	.41*	.44*	.01	.26	.31*	.28													
17 Sends laws to constitutional court	.34*	.44*	.16	−.54*	.10	.26	.03	.09	.16	.11	−.11	.02	.25	.03	−.11	.07												
18 Proposes legislation	−.12	.30	−.29	.17	.52*	−.06	.26	.46*	.45*	.21*	.19*	.02*	.26	.22	.24	.56*	.08											
19 Issues decrees in non-emergencies	−.04	.27*	−.16	.11	.38*	.36	.47*	.49*	.27*	.47*	.33	.06	.37*	.10	−.12	.47*	−.04	.20*										
20 Proposes amendments to constitution	−.19*	.12	−.21	.03	.11	.19	.16	.07	.16	.14	.60*	−.04	.25	.20	.40*	.29*	.05	.12	.21									
21 Calls special sessions of parliament	.25	−.01	.32	−.04	.03	.13	.31	−.12	.14	.01	.29	−.16	.22	.26	.13	.10	.15	−.09	.12	.30								
22 Special powers if parliament unable to meet	−.01	−.45*	.08	.20	−.47	−.24	−.35	−.35	−.35*	−.45*	−.23*	−.24*	−.34	−.20	.15	−.48*	−.17	−.39*	−.35	.24	−.14							
23 Assumes emergency powers	−.10	.59*	−.15	−.07	.39*	.11	.16	.25	.20	.51*	.47*	.25	.42*	−.35	.11	.39	−.13	.31*	.36	.26	.15	−.57*						
24 Participates in parliamentary sessions	−.13	.11	−.10	−.29*	.06	−.15	−.15	.13	.09	−.01	−.34	.12	.18	.19	−.09	.12	.26	.30	−.17	−.24	−.20	−.13	−.13					
25 May address parliament	.08	.24	.12	−.17	−.11	.11	−.20	.01	−.02	.01	−.11	.22	.10*	.01	.34*	.00	.37*	.07	−.18	−.13	−.03	−.04	−.17	.43*				
26 May convene cabinet sessions	.02	.17	.21	.44*	−.20	−.35	−.15	−.06	−.29	−.17	−.29	−.22	.08	−.01*	−.43*	−.24	−.10	−.05	.16	−.18	−.18	.07	−.04	−.02	−.06			
27 Participates in cabinet sessions	.03	.30*	.24	.09	.19	.11	.11	.11	−.07	.15	.08	−.09	.42*	.27	−.39*	.00	.17	−.20	.38*	−.12	.19	−.27	.17	.16	−.04	.39*		
28 Annuls acts of other bodies	−.22	.43*	−.14	−.20	.64*	.38	.46*	.54*	.61*	.62*	.77*	.11*	.47*	.24	.24	.70*	.10	.38*	.48*	.45*	.13	−.49*	.61*	−.10	−.12	−.28	.10	
29 Prepares and submits budget	−.18	−.05	−.41*	.07	.44*	.13*	.47*	.28*	.33*	.15	.28	−.01	.11	.12	−.01	.26	−.16	.27	.21	.09	.04	−.23	.12*	−.23	−.33*	.01	.06	.22

Notes: Cells contain Kendall's Tau b measures of association between ordinal level variables. Statistically significant associations at the 0.1 level are marked with a *.
All items contain 3 categories, save categories 4 (.5 or 1), 15 (0 or 1), 25 (0 or 1), and 27 (0 or 1), which contain only two categories.
Source: Armingeon and Careja (2007).

Table 4. Patterns of Association between 29 Weighted Constitutional Powers in 28 Post-communist Countries

Constitutional power	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1 Dissolves parliament																												
2 Calls referendum	.48*																											
3 Calls elections	.80*	.57*																										
4 Appoints prime minister	.47*	.52*	.76*																									
5 Appoints ministers	.27	.53*	.45*	.44*																								
6 Appoints constitutional court	.33*	.52*	.52*	.39*	.54*																							
7 Appoints supreme court	.23	.38*	.42*	.53*	.84*	.66*																						
8 Appoints judges	.11	.50*	.44*	.42*	.81*	.50*	.76*																					
9 Appoints prosecutor general	.20	.46*	.38*	.41*	.69*	.63*	.77*	.69*																				
10 Appoints senior central bank chief	.22	.61*	.43*	.31*	.68*	.66*	.67*	.70*	.58*																			
11 Appoints security council	.29	.60*	.53*	.44*	.64*	.62*	.57*	.51*	.68*	.71*																		
12 Appoints senior officers	.34*	.38*	.41*	.44*	.36*	.52*	.17	.17	.19	.33*	.33*																	
13 Appoints senior commanders	.30*	.65*	.49*	.38*	.55*	.62*	.57*	.49*	.70*	.63*	.72*	.31*																
14 Commander in chief of armed forces	.30*	.59*	.60*	.66*	.62*	.57*	.57*	.58*	.62*	.63*	.63*	.44*	.66*															
15 Chairs national security council	.14	.27	.39*	.49*	.36*	.41*	.23	.35*	.44*	.31*	.54*	.51*	.35*	.69*														
16 Remands law	.10	.53*	.41*	.51*	.77*	.66*	.75*	.85*	.82*	.66*	.62*	.37*	.55*	.76*	.55*													
17 Sends laws to constitutional court	.49*	.67*	.46*	.26	.36*	.54*	.34*	.38*	.40*	.40*	.24	.23	.50*	.50*	.22	.44*												
18 Proposes legislation	.11	.51*	.30*	.55*	.69*	.50*	.68*	.74*	.69*	.59*	.49*	.28	.55*	.63*	.46*	.82*	.40*											
19 Issues decrees in non-emergencies	.36*	.56*	.65*	.55*	.65*	.62*	.71*	.68*	.55*	.64*	.42*	.30*	.60*	.57*	.17	.70*	.29*	.58*										
20 Proposes amendments to constitution	.19	.48*	.45*	.57*	.42*	.58*	.43*	.41*	.54*	.51*	.72*	.32*	.61*	.76*	.64*	.60*	.43*	.53*	.49*									
21 Calls special sessions of parliament	.50*	.37*	.56*	.47*	.45*	.47*	.51*	.23	.52*	.37*	.55*	.19	.57*	.71*	.48*	.47*	.45*	.39*	.43*	.58*								
22 Special powers if parliament unable to meet	.26	.09	.51*	.47*	−.13	.19	−.03	−.10	.00	−.15	.10	.15	.02	.32*	.40*	−.02	.03	−.12	−.02	.48*	.19							
23 Assumes emergency powers	.28	.75*	.47*	.38*	.66*	.55*	.52*	.54*	.54*	.77*	.71*	.47*	.66*	.67*	.42*	.66*	.47*	.62*	.57*	.59*	.52*	.19						
24 Participates in parliamentary sessions	−.06	.26	−.00	.03	.20	.12	.07	.28	.28	.07	−.09	.26	.28	.27	.13	.35*	.37*	.41*	.08	.15	.00	−.02	.16					
25 May address parliament	.33*	.48*	.40*	.42*	.16	.39*	.10	.23	.24	.14	.22	.40*	.32*	.46*	.61*	.37*	.51*	.34*	.11	.35*	.27	.29*	.17	.44*				
26 May convene cabinet sessions	.39*	.51*	.67*	.57*	.12	−.00	.18	.17	.05	−.04	−.02	−.03	.31*	.34*	−.11	.06	.13	.16	.31*	.15	.18	.28	.03	.22	.14			
27 Participates in cabinet sessions	.28*	.54*	.61*	.39*	.42*	.32*	.39*	.32*	.30*	.28	.32*	.06	.55*	.49*	−.07	.27	.40*	.14	.51*	.23	.47*	.04	.40*	.25	.09	.57*		
28 Annuls acts of other bodies	.27	.66*	.55*	.38*	.75*	.67*	.65*	.74*	.76*	.82*	.85*	.36*	.71*	.62*	.42*	.81*	.40*	.65*	.68*	.61*	.42*	−14	.81*	.15	.19	−.02	.34*	
29 Prepares and submits budget	.31*	.47*	.53*	.44*	.61*	.44*	.69*	.50*	.50*	.39*	.44*	.22	.34*	.46*	.22	.47*	.11	.49*	.42*	.34*	.29*	.03	.35*	−.07	−.05	.21	.25	.38*

Notes: Cells contain Spearman's correlation coefficients. Statistically significant associations at the 0.1 level are marked with a *.
Source: Armingeon and Careja (2007).

Table 5. Country Rankings between Unweighted and Weighted Presidential Power Indices in 28 Post-communist Countries

Unweighted composite index			Weighted composite index		
Ranking	Total score (1–3)	Country	Ranking	Total score (0.5–3)	Country
1	1.31	Slovenia	1	0.76	Latvia
2	1.52	Latvia	2	0.78	Albania 1998
3	1.55	Albania 1998	3	0.79	Estonia
4	1.55	Macedonia	4	0.84	Albania 1991
5	1.59	Estonia	5	0.88	Czech Republic
6	1.69	Albania 1991	6	0.91	Slovakia
7	1.76	Croatia 2001	7	0.93	Moldova 2000
8	1.76	Czech Republic	8	0.95	Hungary
9	1.83	Bulgaria	9	1.31	Slovenia
10	1.83	Slovakia	10	1.55	Macedonia
11	1.86	Moldova 2000	11	1.76	Croatia 2001
12	1.90	Croatia 1990	12	1.83	Bulgaria
13	1.90	Hungary	13	1.90	Croatia 1990
14	1.90	Romania 1991	14	1.90	Romania 1991
15	1.93	Lithuania	15	1.93	Lithuania
16	1.93	Mongolia 1992	16	1.93	Mongolia 1992
17	1.93	Poland 1997	17	1.93	Poland 1997
18	1.97	Belarus 1994	18	1.97	Belarus 1994
19	2.00	Turkmenistan	19	2.00	Turkmenistan
20	2.07	Armenia	20	2.07	Armenia
21	2.07	Tajikistan 1994	21	2.07	Tajikistan 1994
22	2.10	Tajikistan 1999	22	2.10	Tajikistan 1999
23	2.14	Ukraine	23	2.14	Ukraine
24	2.17	Moldova 1994	24	2.17	Moldova 1994
25	2.24	Georgia	25	2.24	Georgia
26	2.28	Kazakhstan 1994	26	2.28	Kazakhstan 1994
27	2.28	Kazakhstan 1999	27	2.28	Kazakhstan 1999
28	2.28	Uzbekistan	28	2.28	Uzbekistan
29	2.38	Azerbaijan	29	2.38	Azerbaijan
30	2.38	Kyrgyzstan 2003	30	2.38	Kyrgyzstan 2003
31	2.41	Kyrgyzstan 1993	31	2.41	Kyrgyzstan 1993
32	2.41	Russia	32	2.41	Russia
33	2.55	Belarus 1996	33	2.55	Belarus 1996

Source: Armingeon and Careja (2007).

Comparing the unweighted and weighted data, we notice a similar number of items with high loadings on the first factor (10 items with loadings above 0.60 and no significant cross-loadings). The power to annul the acts of other bodies (28) displays the highest loading with the latent construct in both cases, along with the power to remand law (16) and to appoint ministers (5) – the first two are veto powers and the last pertains to cabinet-formation rules, a defining feature of the parliamentary versus presidential distinction. A series of powers of appointment also correlate highly

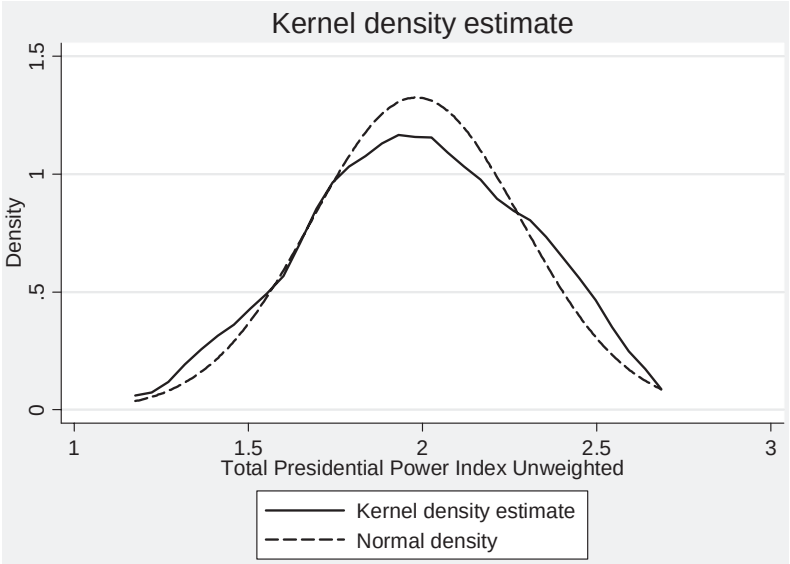

Figure 1. Kernel Density Plot of Unweighted Presidential Power Index
Source: Armingeon and Careja (2007).

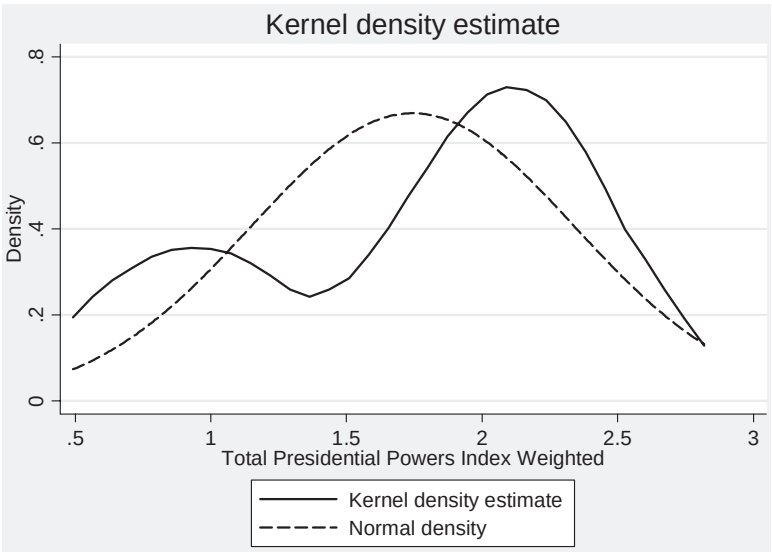

Figure 2. Kernel Density Plot of Weighted Presidential Power Index
Source: Armingeon and Careja (2007).

in both versions of the data: the power to make appointments to a supreme court (7), to install judges (8), to select the prosecutor general (9), to choose the central bank chief (10), and to appoint the security council (11). Also highly correlated with the latent construct is the power to issue decrees in non-emergencies (19) and to assume emergency powers (24). Given their stability

across different testing conditions, these 10 items could be considered as core features of presidential power allotted in constitutions.

The weighted data produced a two-factor solution, with some interesting results. A series of symbolic prerogatives of presidents in functionally parliamentary systems correlate closely with the second factor. The powers to call elections (3), to address the parliament (25), to convene cabinet sessions (26), and to participate in cabinet sessions seem to pertain to a different latent construct. However, quite surprisingly, the prerogative to dissolve parliament (1) correlates with this latent construct, but only once weighted, which leads me to suspect that reducing certain scores by half taps into a concept that does not necessarily follow the original coding logic of each item.[13]

In the end, considering both weighted and unweighted data, many of the items included are not closely linked to any factor: the power to call referendums (4) and to appoint the prime minister (4), constitutional court (6), and senior officers (12). Also unrelated to any factor is whether the president is the commander in chief of the armed forces (14), chairs the national security council (15), submits laws to the constitutional court (17), proposes amendments to the constitution (20), calls special sessions of the parliament (21), retains special powers if parliament is unable to meet (22), and participates in parliamentary sessions (24). Including such items in a composite index would only serve to make the end measurement difficult to interpret, since the components do not share a common causal influence. One way to explain these findings is that certain powers can be interpreted differently depending on the country, and do not necessarily have the same import in all cases, for instance, the powers associated with being commander in chief of the armed forces (Gallagher, 1999; Müller, 1999; Tavits, 2009). Including such items would be a source of measurement error.

4. Toward a more (or less) parsimonious approach to measuring executive power

In constructing composite indices of presidential power, the main dilemma seems to revolve around reaching a balance between exhaustive measurements that are low in validity and reductive measurements that are higher in validity and reliability, but potentially fail to capture important dimensions. In the short term, my preliminary proposal for addressing the issues raised in this article follows along the line of Krouwel's suggestion (2003) to identify the core elements of presidentialism instead of using a laundry list of powers assigned to a president. The hope is that by focusing on a few core items, we obtain a functionally equivalent common denominator with which to compare countries (Przeworski and Teune, 1967). However, I propose to go a step further, and suggest to focus index construction on items that pertain to a single construct, in order to boost validity and reliability. With this method, all items selected should be closely linked to each other in a manner that is internally consistent.

In the case of the index proposed by Shugart and Carey, given that the data did not conform to a two-dimensional operationalization of the concept of executive power in legislative and non-legislative prerogatives, it would make sense to eliminate this distinction at least empirically. Further, I would propose reducing the number of items from 10 to 6, concentrating on items displaying the highest inter-item correlations and factor loadings on the single factor uncovered. This would yield a more precise measurement (presented in Table 7). The consequence of this decision would be to exclude some items that are theoretically important, such as decree powers, budget prerogatives, referenda initiation, and dissolution of the assembly. The argument that justifies leaving these items outside an index is definitely not that these features are irrelevant. Rather, they are likely parts of different constructs produced by different causal factors, and their effects might be lost by aggregating them.

Table 6. Factor Analyses of Unweighted and Weighted Presidential Power Indicators in 28 Post-communist Countries

Items	Unweighted items	Weighted items	
	Factor 1	Factor 1	Factor 2
1 Dissolves parliament			0.81
2 Calls referendum	0.44		
3 Calls elections			0.91
4 Appoints prime minister			
5 Appoints ministers	0.77	0.87	
6 Appoints constitutional court	0.44		
7 Appoints supreme court	0.65	0.84	
8 Appoints judges	0.71	0.83	
9 Appoints prosecutor general	0.66	0.84	
10 Appoints senior central bank chief	0.67	0.78	
11 Appoints security council	0.74	0.80	
12 Appoints senior officers			
13 Appoints senior commanders	0.61		
14 Commander in chief of armed forces			
15 Chairs national security council		0.47	
16 Remands law	0.80	0.91	
17 Sends laws to constitutional court			0.56
18 Proposes legislation	0.55	0.81	
19 Issues decrees in non-emergencies	0.64	0.68	0.40
20 Proposes amendments to constitution			
21 Calls special sessions of parliament			
22 Special powers if parliament unable to meet			
23 Assumes emergency powers	0.64	0.74	
24 Participates in parliamentary sessions			
25 May address parliament			0.51
26 May convene cabinet sessions			0.67
27 Participates in cabinet sessions			0.65
28 Annuls acts of other bodies	0.89	0.90	
29 Prepares and submits budget		0.60	

Notes: Factor loading cutoff is set at .4 (see Hair et al., 1998).
Dominant factors above 0.6 are in boxes, except in cases in which there are significant cross-loadings.
Regarding the unweighted data, the items depicting the powers to dissolve the assembly (1), to call elections (3), and to appoint senior officers (12) and whether the president has special powers if parliament is unable to meet (22) and whether he or she may convene cabinet sessions (26) were removed from the analyses.
Regarding the weighted data, the items depicting the powers to call a referendum (2) and to appoint the prime minister (4), the constitutional court (6), and senior commanders (13) as well as whether the president is the commander in chief of the armed forces (14), proposes amendments to the constitution (20), and calls special sessions of parliament (21) were removed from the analyses.
Source: Armingeon and Careja (2007).

Table 7. Factor Loadings of Six Presidential Power Items

Items	Factor 1
Package veto	0.58
Partial veto	0.61
Exclusive introduction legislation	0.48
Cabinet dismissal	0.74
Cabinet formation	0.85
Censure	0.71

Notes: Table 7 excludes authoritarian countries, for a total of 47 cases.
The single factor retained captures 92 percent of variance in the items.
Cronbach's α = 0.81; KMO = .73.
Sources: Shugart and Carey (1992), Frye et al. (2000).

Finding an appropriate compromise solution for indices made of a larger number of powers in an even smaller sample of cases, such as the one proposed by Armingeon and Careja (2007) in *Comparative Data Set for 28 Post-communist Countries, 1989–2007*, is challenging. This is especially so if we take into account that 'in many polities, legislatures hold a grab bag of powers rather than neat sets from prerogatives typically associated with a distinct type of constitutional system' (Fish and Kroenig, 2009: 5). Given that this observation likely applies to executives as well, it raises the question of whether it is the nature of each power that matters for overall levels of presidential power rather than the sheer accumulation of individual powers, some of great magnitude, some more ceremonial. In other words, is a president considered constitutionally powerful based on his or her holding a myriad of powers (the more items, the more powerful) or because he or she holds a set of key central powers? Table 8 presents a factor analysis of 11 core items depicting powerful presidents.

Despite the fact that some items proposed in Armingeon and Careja (2007) are slightly different than those included by Shugart and Carey (1992), we find comparable patterns between the two approaches to measurement that could be interpreted as evidence of the centrality of certain prerogatives in defining the concept of presidential power. One of the highest loading factors in both cases is the power to appoint ministers, or what Shugart and Carey call 'cabinet formation'. Presidential veto powers are also strongly correlated with the factors retained: the power to remand law for reconsideration from Armingeon and Careja (2007) as well as the package and partial veto items. Both indicators pertaining to the exclusive introduction of legislation also present moderately strong correlations with the retained factor.

Although not shown in Tables 7 and 8, in both measurement schemes the item representing the power to dissolve the legislative assembly presents a small negative coefficient with the retained factor. This finding is somewhat unanticipated considering the centrality that this power is given in the literature.[14] However, the strong, positive correlation coefficient of the item measuring powers of cabinet dismissal in the Shugart and Carey and in the Frye, Hellman, and Tucker data is perhaps a hint either that prerogatives over the cabinet might be closer to the core concept of presidential power, or that the continuum on which the power to dissolve the legislative assembly is measured is not helpful in gauging the extent and direction of the prerogative. What is crucial to emphasize at this point is that this approach to parsimony is by no means a call to discard such prerogatives as unimportant – quite to the contrary. I do not suggest wholesale exclusion of these different presidential prerogatives from analyses, but instead more leeway to analyze them separately. The more independent prerogatives should be given additional scrutiny by being analyzed separately from the bulk of other powers, rather than simply treated as part of the same 'grab bag'.

Table 8. Factor Loadings of 11 Unweighted Presidential Power Items

Items	Factor 1
Appoints ministers	0.80
Appoints supreme court	0.67
Appoints judges	0.78
Appoints prosecutor general	0.67
Appoints senior central bank chief	0.66
Appoints security council	0.67
Remands law	0.83
Proposes legislation	0.58
Issues decrees in non-emergencies	0.62
Assumes emergency powers	0.58
Annuls acts of other bodies	0.89

Notes: The single factor retained captures 74 percent of variance in the items.
Cronbach's α = 0.90; KMO = .81.
Source: Armingeon and Careja (2007).

5. Conclusions

Index construction is a process that is performed in several steps, the first and most crucial of which is its theoretical foundation. Although this article presents some findings that can be considered problematic for accepted theoretical claims, the issues raised are concentrated in the measurement and aggregation steps of index construction and do not necessarily challenge the theories that undergird item selection. While many findings are counterintuitive, we must keep in mind that results are based on a small number of cases, often too limited for rigorous testing, that indicators undoubtedly contain random and systematic measurement errors, and that similar theoretical concepts can be operationalized in a variety of ways. The failure of the present article to find as much association between items measuring presidential power as previously assumed could be due to any or all of these factors. Despite these limitations, I strongly believe it is useful to attempt to address the issues of the validity and reliability of composite and aggregate measurements, especially if these are employed in statistical models in which strong assumptions are made about the data. The contribution this article seeks to make is mainly empirical, although it may lead to rethinking some of the theory underlying measurement schemes.

What are the rules for the establishment of a measurement of presidential prerogatives? Do all powers vested in presidents in constitutions map a single latent construct? More simply, should we even make a composite index? In all likelihood, some of the individual features of presidential power may present inter-item correlations of such magnitude that their aggregation in an index is advisable. However, I hope that the results from the analyses performed in this article suggest that researchers should proceed with caution when clustering a series of elements hypothesized to measure an abstract concept into composite indices such as the ones proposed by Shugart and Carey (1992), Frye et al. (2000), Armingeon and Careja (2007), and many others (Elgie, 1998; Frye, 1997; Krouwel, 2003; Lucky, 1993–94; Metcalf, 2000; Siaroff, 2003). Aggregation produces homogeneity claims, meaning that equal scores are substitutable or equivalent (Goertz, 2008: 110). But in reality, for presidential power indices, each score can be obtained through broad combinations of different powers, and should thus not be considered homogenous in terms of causal analyses.

What also emerges from the present investigation is that when looking at individual indicators of presidential power separately, not all items hypothesized to capture the concept of presidential power seem to matter equally in accounting for composite scores. Conversely, not all potentially relevant items were tested. Moreover, even if we hypothesize that the concept of presidential power is unidimensional, which probably is not the case, some items might be too independent to warrant inclusion in a composite index. By introducing too much variance resulting from unrelated processes, the effects of core items are washed out in uninterpretable noise. It is perhaps more useful for some prerogatives to be examined separately than to use black-box composite measures that do not measure what they claim.

To conclude, these findings raise a series of questions, and open the door to additional testing that lies beyond the scope of this article. One possibility is to revisit the level of measurement used by most approaches. Specifically, it would be useful to evaluate the effects of using fundamentally ordinal or categorical variables as if they were metric, since it is not clear that the numerical labels given to categories mean that these numbers can be considered to represent quantities of a certain attribute. Using numbers implies equal distance between categories. This is a very strong assumption that remains untested. Doing so can introduce more unreliability in measurement, and might also mask substantive variations in institutional arrangements. It is also beyond the scope of this article to address the changes in rankings that any modification in item selection might produce. Last, and perhaps most interesting, is the issue of bimodality. Does pervasive bimodality hint that we are in the presence of a phenomenon that has different manifestations in more parliamentary versus more presidential regimes?[15] Bimodality also indicates that it might not be possible to systematically differentiate semi-presidential arrangements from other arrangements. Performing (regression) analyses using a single continuum of presidential power across different political systems might prove technically problematic given their non-normal distributions, and I would urge caution in interpreting parameter estimates from models exhibiting departures from linearity. Given the limited validity of existing indices, it may be necessary to reconsider previous findings altogether.

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Notes

1. The literature on the American presidency offers avenues for exploring the power the president holds inside and outside the legislative arena (legislative versus unilateral strategies), influence (negotiation, bargaining, and public appeals), and leadership (personality and decision-making style) (Burns, 1978; Lowi, 1985; Neustadt, 1980; Pious, 1979; Rossiter, 1960; Schlesinger, 1973; Skowronek, 1993; Wildavsky, 1991). However, contributions are mostly qualitative and with a level of specificity that often impedes comparisons with other cases – the '$n = 1$ problem' (Howell, 2006; King, 1993).
2. The reader will notice that Pearson's correlation coefficients and later factor analyses are employed or performed on what are fundamentally ordinal variables, measured in quasi-interval form, such that figures can assume values from 0 to 4, with 0.5 gradations (seven categories). Note that categorical variables with similar gradation tend to correlate, regardless of their content. However, according to Lubke and Muthén (2004: 2), in factor analyses, 'given a sufficiently large number of response categories (e.g., 7), and absence of skewness, and equal thresholds across items, it seems possible to obtain reasonable results'.

3. A Polity IV (Marshall and Jaggers, 2009) rating below 5 was considered authoritarian. The effects of pooling two different groups of countries were controlled for. There are little to no differences between the two groups of countries apart from the powers related to decrees, which show a higher correlation within the group for former communist countries.
4. The reality of constitutional choices that have been made in countries reflects a different combination of powers than that of the ideal type of 'strong constitutional powers' reflected in Shugart and Carey's scoring scheme. In fact, no real-world case scores the maximum points in their first dimension, that is, legislative powers. Out of 24 potential points in legislative powers, the highest score is 12 points by Chile for its 1969 constitution, while all other cases' scores range between 0 and 8. The theoretical scoring system is somewhat disconnected with empirical cases.
5. When a Cattell's Scree test (Cattell, 1966) is performed, the factor structure indicates that retaining a single factor would be most advisable. In addition to a Scree test, results from Horn's parallel analysis for principal components using 5000 iterations also confirms this structure (Hayton et al., 2004; Horn, 1965). Horn's method is particularly helpful in situations such as the present one, in which the n is finite given that the Guttman-Kaiser criterion gets closer to its ideal as n reaches infinity. Furthermore, Horn's method 'has been indicated as a consistently accurate method by all studies where it was used' (Glorfeld, 1995; Zwick and Velicer, 1986).
6. Armingeon and Careja's database (2007) provides observations for all post-communist constitutions, resulting in a final number of cases slightly higher than the 28 countries considered for a total of 33 valid cases. The duplicate cases are the countries in which there were significant constitutional changes: Albania in 1991 and 1998, Belarus in 1994 and 1996, Croatia in 1990 and 2001, Kazakhstan in 1995 and 1999, Kyrgyzstan in 1994 and 1993, Moldova in 1994 and 2000, and Tajikistan in 1994 and 1999. I have retained all duplicates as valid observations in the analyses. Unlike in the preceding section, I have not sought to remove authoritarian regimes from the estimations performed, since their large number makes it impossible to run independent tests on such a small sample size.
7. The small amount of significant coefficients and negative associations between the power to appoint prime ministers and other items might be explainable by the composition of the population under study. In 27 out of the 33 cases, this power is shared with another governing body, while in only 6 cases does a president hold power exclusively. In no cases is this variable coded as 0, although in most instances in which this prerogative is being shared, it is also a symbolic power.
8. It should be stressed here that the magnitudes of τ_b and of Spearman's ρ coefficients should not be compared since they are obtained by different processes.
9. The rule of thumb with the KMO measure is that if it is less than 0.5, one should not perform a factor analysis. What this means is that if it is greater than 0.5, but still less than 0.6, the degree of common variance among the 29 variables is still mediocre. If a factor analysis is conducted, the factors extracted will only account for a fair amount of variance.
10. The items were removed on the basis of the small number of significant inter-item associations in Table 3 as well as their low KMO values.
11. Previous analysis has demonstrated that dichotomous data tend to yield many factors (when referring to the Kaiser criterion), and also that many variables tend to load on these factors (by the usual 0.4 cutoff), even when analyses were performed with randomly generated data (Shapiro et al., 2002). The different approach I take to selecting factors in this case is due to the measurement of each item in only three categories (rather than the seven in Shugart and Carey), in order to minimize the risk of retaining random factors. The factor solutions uncovered in parallel analyses were also confirmed in conjunction with Cattell's Scree plots (1966).
12. In the case of the factor analysis using the weighted data, seven items displayed substantial cross-loadings in both factors retained, which complicates the interpretation of these items. To solve this

problem, Costello and Osborne (2005) suggest removing the cross-loading items from the analyses when correlations are strong to moderate (0.5 or higher) and when there is a non-negligible number of cases such as in the present analyses. With this, the items depicting the powers to call a referendum (2), to appoint the prime minister (4), the constitutional court (6), and senior commanders (13) and whether the president is the commander in chief of the armed forces (14), proposes amendments to the constitution (20), and calls special sessions of parliament (21) were removed from the factor analysis (weighted data).

13. In four countries (Uzbekistan, Russia, the Czech Republic, and Latvia), the power to dissolve the legislature is 'shared', and in two of these, presidents are indirectly elected (the Czech Republic and Latvia). This 'shared' coding decision was probably taken to depict cases in which there are some (at times, narrow) conditions for dissolving the legislature stipulated in constitutional articles. However, it was not applied evenly across cases. For instance, the Czech Republic was coded (before weighting) as 0.5, while Albania and Slovakia were given scores of 1, but all three presidents face an approximately equal degree of constraint to dissolving the assembly. Weighting the data by 0.5 in the case of indirectly elected presidents serves to blur these scores further. Once weighted, Latvia and the Czech Republic obtain scores of 0.25 (although their presidents can dissolve the legislature), Slovakia retains its score of 1, and Albania then achieves a score of 0.5. As a result, after the transformation, each item's final score may no longer be an accurate measurement of the item of assembly dissolution.
14. A similar scenario unfolded with budgetary powers. In both cases, for the larger initial factor analyses high levels of presidential budgetary powers present positive, but smaller correlation coefficients with the retained factors.
15. The vast majority of composite indices of presidential power, including those presented in Section 4, are not normally distributed, but present bimodal distributions.

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