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Mapping Democratic Innovations: A Bottom-up Empirical Perspective

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ABSTRACT

Literature in democratic innovations highlights format or process-centred strategies to classify democratic innovations. However, both format and process-centred classification strategies suffer from conceptual stretching, leading to cases' omissions or overlapping typologies. This research proposes a new analytical approach to classifying democratic innovation based on prototypical radial categorization. Prototypical radial categorization classifies objects considering their similarity to a central category and empirically establishes how observations are related to normative accounts of democratic innovations. The proposed categorization strategy is empirically evaluated on real-world democratic innovations drawn from Participedia, the largest crowd sourcing platform in democratic innovation. Participedia database is analyzed through multiple factor analysis (MFA) and hierarchical clustering on principal components (HCPC). The analysis highlights four clusters that are a subset of two main groups that coincide with the normative categorization of participatory and deliberative democracy.

KEYWORDS

Democratic innovations;
democratic participation;
participedia

Introduction

In the literature, the term *democratic innovation* often refers to the set of political practices beyond the traditional understanding of democratic participation. Many scholars have strived to theorise, define and classify democratic innovations. In this respect, many scholars' conceptualisations of democratic innovations have been mainly normative-centred and built upon theoretically informed ideal-typical categorisation strategies (e.g., Elstub & Escobar, 2019; Geissel, 2013; Smith, 2009).

However, as discussed in this paper, existing top-down approaches tend to ignore the issues of conceptual stretching, as they simultaneously employ descriptive and explanatory attributes of a concept to build their respective ideal types. Although these approaches can precisely define ideal-typical cases considering a specific set of necessary attributes, they are deemed to be problematic as they provide a poor level of abstraction and generalisation. In practice, existing normative-driven approaches tend to be detached from real-world examples. They focus on a very peculiar ideal-typical

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understanding of democratic innovation instead of providing the instrument of analysis that fits the existing universe of democratic innovations.

This gap in the literature can be addressed by adopting a purely bottom-up approach that involves mapping real-world democratic innovations considering conceptual stretching implications. The taxonomical strategy proposed here exploits empirical-based insights to build democratic innovation categories from real-world examples inductively. Conceptual stretching is then faced considering a prototypical radial categorisation strategy (Lakoff, 2008; Rosch, 1973), which allows locating cases depending on their distance to a prototypical central case. Consequently, cases are not defined through a fixed set of attributes (which configuration produces conceptual stretching) but rather by considering their distance to a prototypical central example. Unlike existing normative-driven approaches that classify cases according to an enclosed membership function of necessary and sufficient attributes, the prototypical approach classifies cases according to their similarity to a central category, which encompasses the best observable examples of such a category.

In this study, real-world data will be drawn from Participedia, the largest and most completed crowdsourcing platform for democratic innovations. Performing an in-depth analysis of Participedia will allow us to evaluate democratic innovations from an empirical point of view and to inductively uncover the prototypical typologies of democratic innovations beyond existing theoretical taxonomical accounts.

This paper is organised as follows. First, we will provide an overview and critically address the existing typological categorisation in the field of democratic innovation. This critical overview will allow us to identify the core descriptive principles that should be considered to empirically define the variables employed to mine democratic innovations within Participedia. Then, using a multiple factor analysis (MFA) (Abdi, Williams, & Valentin, 2013), we will reduce the noise around such variables and individuate the core dimensions characterising democratic innovations. Finally, we will use hierarchical clustering on principal components (HCPC) (Lê, Josse, & Husson, 2008) in defining all the categories in proximity along the MFA dimensions. MFA/HCPC will allow us to identify the number of prototypical clusters pertaining to the denotative characteristics of democratic innovations and to inductively map the methods characterising democratic innovations within the Participedia database. This should result in a multi-dimensional map in which various democratic prototypes are inserted and related together. This technique is exceptionally flexible because it allows connecting each case within multiple prototypes and defining which cases are central or peripheral within a prototypical category.

Existing Typologies and Classification of Democratic Innovations

Elstubb and Escobar (2019) highlighted several challenges in typifying democratic innovations. Their scoping review distinguished between a format-centred and a process-centred taxonomical approach. This paper will summarise and discuss these analytical strategies by highlighting the main limitations from a comparative research design perspective.

Format-Centred Classification

Format-centred classification is rooted in the idea that democratic innovations are containers of processes, dynamics, targets or principles. For example, Michels (2011)

focussed on the format of referendums, participatory policymaking, deliberative surveys and deliberative forums. Similarly, Elstub and Escobar (2019) characterised the format of mini-publics, participatory budgeting, referenda and collaborative governance. Likewise, Smith (2009) distinguished between popular assemblies, mini-publics, participatory budgeting, direct legislation and e-democracy, and Baiocchi and Ganuza (2016) mainly provided a list of format examples.

Although format-centred taxonomy is probably the most intuitive and widespread analytical framework, it is considered problematic for at least two reasons.

- First, format-based frameworks tend to produce rigid typologies, which lack conceptual distinctiveness because formats are understood as a configuration of features that often re-appear in other formats. In this respect, Michels (2011) distinguished between deliberative forums and deliberative surveys as two standalone categories. However, these two categories are *de facto* related by a similar conceptual dimension of being discourse-centred processes. Therefore, they can possibly be combined into a broader format of mini-public.
- The second issue is linked to the possible democratic innovation omission that a format-based typology can produce. In fact, treating typical categories as containers of processes, dynamics and targets results in conceptual stretching because categories are anchors to a specific set of contingent elements. Conceptual stretching emerges when the number of necessary attributes that define a format increase, causing the resulting format to refer to a restricted set of cases (Collier & Mahon Jr, 1993; Sartori, 1970). For example, it would be challenging to insert street forms of participation within the aforementioned formats, such as Park(ing) (Thorpe, 2020), or non-decision-making forms of participation, such as crowdsourcing, crowdfunding, picketing or micro-finance. In this respect, despite being normative-driven, format-centred categorisation suffers *de facto* from immense conceptual stretching and a low level of abstraction, preventing its use as a conceptual framework for cross-analysing existing democratic innovations.

Family Resemblance Formats

To avoid feature overlap, Elstub and Escobar (2019) raised the level of conceptual abstraction of democratic innovations by developing a format-based framework rooted in Wittgenstein's idea of family resemblance (Wittgenstein & Anscombe, 1968). Within family resemblance, Elstub and Escobar's framework considers typologies as a crisscrossing network of similarities. In this respect, they defined the quasi-contingent elements (i.e., extension of power and influence, mode of decision-making, participation selection and mode of participation) and contextual elements (i.e., governance level, policy area and policy stage) of democratic innovation. They also specified five categories in which it is possible to observe different alterations of each categorical element within different formats. However, while the idea of family resemblance is very pertinent to democratic innovation categorisation, as it should provide an instrument for producing a high level of abstraction and low conceptual stretching (Collier & Mahon Jr, 1993), it is hardly applicable to a format-based typology. In fact, the domains of formats are usually

restricted by the context and present specific definitional attributes necessary for defining the format itself. Formats are enclosed containers in which the principle of compositionality defines various democratic practices. As such, within formats, it is only possible to find rigid sets of rules, attributes and definitional characteristics.

In contrast family resemblance is mainly based on the principle of typicality (e.g., Kamp & Partee, 1995; Lakoff, 1999; Rosch & Mervis, 1975), in which elements of a family are categorized considering their distance to a central case. This distance defines the so-called representativeness relationship of an object with a prototype. In fact, within the concept of family resemblance conceptualisation, compositional and typicality principles are in tension. This is because the former formulates categories according to a membership function that frames concepts into parts, whereas the latter considers a gradual perspective that involves a linear dimensional space (Veri, 2021).

Elstub and Escobar (2019) provided a set of quasi-contingent and contextual elements for each format. They followed the compositional principle of classic categorisation that frames a concept (i.e., formats) into parts. Essentially, despite being normative-driven, instead of providing a high level of abstraction, Elstub and Escobar's (2019) definition results in very specific representations of democratic innovation that are limited from analytical and empirical perspectives. In other words, defining a category as an enclosed container of necessary and non-necessary attributes, poses the risk of creating overfitting categories that are exclusive and unrelated to each other.

Moreover, beyond the oxymoronic relationship between formats and family resemblance, there is a second level of conceptual stretching in Elstub and Escobar's proposition. This refers to the overlap of descriptive and explanatory features that define a typology (Collier, LaPorte, & Seawright, 2012). Generally, the descriptive features of typologies are established to describe an object. In contrast, explanatory features are defined by an explanatory attribute. Explanatory typologies tend to be specific, contextual, or idiosyncratically related to a specific outcome. As such, they automatically reduce the domain to which such a typology can be applied. In fact, in Elstub and Escobar's (2019) study, we observe a process of concept over-specification (as explained by Munck & Verkuilen, 2002) in which the meaning of each democratic innovation family includes too many attributes: a set of attributes that point to a definitional level and a set of attributes that points to a functional level of the format. In this regard, for example, Elstub and Escobar (2019) classified participatory budgeting as a standalone family of democratic innovations by considering as a necessary attribute the functional/explanatory feature of public spending together with the definitional/descriptive levels of the mode of participation, selection and decision output. However, while participatory budgeting might have some normative peculiarities, it is unlikely that a single format can be inflated at the level of the democratic innovation family. In fact, by mixing descriptive and explanatory attributes, Elstub and Escobar (2019) dramatically stretched the membership function of cases that can be included within a larger category of participatory practices.

Process-Based Typology

Geissel (2013) proposed a process-centred typology by considering processes transversal to formats. Specifically, she identified three main process-based democratic innovations:

cooperative governance, *deliberative procedure* and *direct democracy*. Overall, process-based typology can operationalise democratic innovations as open boxes that can include different format typologies. Hence, process-based typologies are more flexible than formats in defining a prototypical typology, and they should be considered the best method for categorising democratic innovations.

However, within the specificity of Geissel's proposition, it is possible to observe some limitations due to the lack of a distinction between the descriptive and explanatory levels of democratic processes. In fact, on the one hand, *deliberative* and *direct democratic* procedures are mainly related to the mode of participation of the citizen (active on one side and passive on the other) and the idea of the decision-output procedure (vote-centric in direct democratic procedures and discourse-centric in deliberative procedures). On the other hand, *cooperative governance* exhibits a hybrid setting in which explanatory and descriptive dimensions are not distinguishable. The identity of cooperative governance is merely defined by Geissel (2013) by considering the explanatory features' perspective of the level of empowerment, legitimacy and effectiveness of the procedure. In this respect, cooperative governance does not have a definite descriptive identity pertaining to citizens' participatory role or the decision-output procedure. Similarly to Elstub and Escobar (2019), Geissel mixed descriptive and explanatory typologies as intended by Collier et al. (2012). This resulted in the conceptual distinctiveness between cooperative governance and other forms of democratic innovation being unclear. This lack of specific conceptual distinctiveness should make cooperative governance a peripheral type of other central categories, such as deliberative or participatory typologies.

Trans-Format Typology: A Prototypical Approach

Together with radial categorisation, family resemblance categorisation has been formalised into the idea of prototype theory by Rosch (1973). Rosch proposed prototypical categories as graded structures of overlapping information linked together by relationships of similarities (Rosch, 1973; Rosch, 1999). A prototype is the best observable example of a specific category, which anchors the ideational content of the concept. Although prototypical categorisation and operationalisation are relatively new in the field of political science (e.g., Veri, 2020; Veri, 2021), it has a great potential in resolving some critical issues in categorising cases for at least four reasons:

- First, prototype categorisation allows mapping cases to consider their distance to a prototypical example rather than a membership function to an enclosed category (Veri, 2021). Essentially, prototype categorisation employs linear distances and degrees of similarity to identify a case. Such a categorisation strategy is crucial because it allows defining ambiguous forms of democratic innovation as peripheral to one or more categories. A prototypical classification strategy would allow classifying in-between cases while considering the distance to a central prototypical example. The proximity of a case to a prototype also determines the membership function to a category.
- Second, the prototypical similarity membership function does not suffer from conceptual stretching, as it does not employ compositionality principles to define cases. Instead, prototypical membership is defined in terms of the principle of typicality, which defines an object according to its distance to a central case. As pointed out

earlier, conceptual stretching is instead strictly linked to categorisation strategies that segment concepts into sets of necessary and sufficient attributes, in which the domain of a category becomes more restricted when populated by more attributes and too broad when some of these attributes are not included (Collier & Mahon Jr, 1993).

- Third, while peripheral examples are not theoretically informed as they can have multiple memberships to different categories, they might be theoretically informative as they can be isolated and analysed as standalone categories. Therefore, as outlined in this paper, we will discuss the importance of these cases despite their peripheral status.
- Fourth, prototype categorisation is based on empirical referents. Consequently, the result of categorisation will include every single real-world example. As discussed earlier, this is not achieved by current top-down categorisation strategy based on ideal types as such ideal types are conceptualised as enclosed box concepts with a very low level of abstraction.

Democratic Innovations in Relation to Normative Accounts

Here, we argue the necessity of defining typologies according to the descriptive level of objects and not according to their explanatory dimension. To do this, the approach that we adopt here focuses on the empirical utility of the concept and defines democratic innovations only through the descriptive level. Here, the descriptive level is considered more appropriate than the explanatory level, as it refers to the specific instances of a broader concept. Therefore, unlike the explanatory level, which points to the instances' functional role, the descriptive level directly points to the intrinsic nature of an object (Collier, LaPorte, & Seawright, 2008). As already argued above, the explanatory level tends to produce context-based categorisation that results in very idiosyncratic definitions related to a possible functional role of democratic innovation. The descriptive level instead classifies objects depending on conceptual instead of functional properties and, therefore, focusses on the intrinsic nature of an object whose functional role is transmutable within various contexts. This approach is empirically more feasible given the bottom-up perspective adopted in this study. In fact, it would be difficult to mine the Participedia database by considering the functional or systemic role of each democratic innovation, as such a role is fuzzy, idiosyncratic and transmutable, according to various contexts.

The bottom-up categorisation is based on data mining technique, and as such the goal is to mine the definitional stances of democratic innovation. Such stances point to a basic descriptive denotative level of *who* participates in a democratic process and *how* the participants interact.

Considering such a descriptive level of democratic processes, it is also possible to point out what describes the concept of democratic innovation considering additional three peculiarities: (i) a mode of participation selection, (ii) a mode of participation interaction and, (ii) a decision-output procedure.

Sample and Data Characteristics

In this study, we analyse the content of the Participedia database, which is the largest and the most completed database on democratic innovations worldwide (Fung & Warren,

Table 1. Exclusion criteria

Exclusion criteria	Example
Format's processes	Decision output process (e.g., consensus, matrix Vote) Format's procedural elements (e.g., deliberation)
Format's tools	Tool for participatory engagement (e.g., body mapping) Technological solutions (e.g., online research tools)
Terms and definitions	e.g., Constitution
Organisations	e.g., Creative Centre for Community Mobilization
Methods with missing data	e.g., Deep listening Circles
Single cases	e.g., Nepalese Participatory Budgeting

2011). The Participedia database is divided into two sections: *methods* and *cases*. The entries in *methods* provide information on the overarching processes used to guide public participation, whereas the entries in *cases* document specific uses of the methods.

Next, we focus on the *methods*, whose description focusses on democratic innovations beyond the singular applied cases. As such, we can find democratic and participatory formats, tools or approaches for participatory engagement and concept definition. Moreover, with the open-source repository, we find some obvious erroneous entries. Given the multiple ways of interpreting the methods sections by the users of Participedia, we decided to apply some exclusion criteria (Table 1). As a result, in December 2021, out of the 343 methods listed in Participedia, we identified 146 format methods.

Generally, the Participedia dataset is structured according to several variables, with a brief description of the method. Variable selection has been developed according to the descriptive level of the concept of democratic innovation by identifying *who* participates and *how* participation occurs. As in Figure 1, from this descriptive level of democratic innovation, it is possible to derive a series of sub-categorisations that refer to their respective attributes and are empirically observable within the Participedia database.

Most of the variables of Participedia selected for this analysis are definitional and transversal to different democratic innovations, whereas other categories are definitional

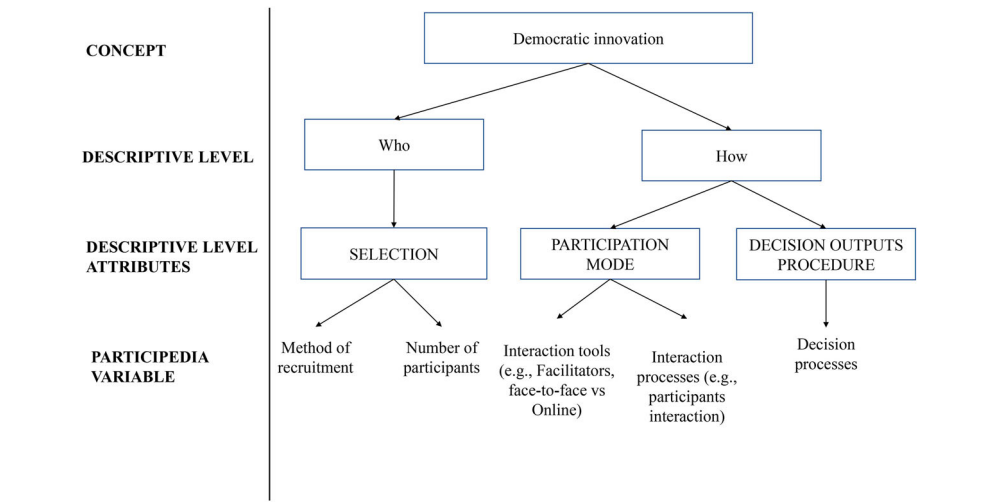


Figure 1. Variable Selection.

to specific prototypical categories. Within the category of *who* participates, we target the *recruitment* method and the *optimal number of participants*. We then complete the blank entries by scraping for missing information and performing a manual case-by-case evaluation while considering pre-established entries (i.e., appointed, captive, elected, random and stratified). Finally, we define the new entry *voluntary engagement* for all the voluntary participation methods.

Within the category of *how* the participation process works, we identify the mode of participation in relation to the *type of method*, which provides information on how participation occurs (e.g., deliberative, direct or protest), *facilitator* (i.e., yes, no or not applicable), *face-to-face or online interaction* and the *interaction type*, which defines how the participants interact (e.g., discussion, storytelling, informal communication or acting). Finally, also within the category of *how* participation occurs, we identify the *decision method*, which refers to the decision-output procedure of a democratic process (e.g., voting, agreement and consensus).

Multiple Factor Analysis and Hierarchical Clustering on Principal Components

MFA (Abdi et al., 2013; Escofier & Pages, 1994; Escofier & Pagès, 1998) is a statistical technique used to reduce variable dimension considering meaningful blocks of selected variables. This technique is an extension of principal component analysis (PCA). Specifically, it is a PCA tailored to handle data tables that contain several sets of observations described by several blocks of variables. Factors' extraction is operated by weighting each block of variable; this allows levelling the different variable blocks' contribution to the final PCA result. MFA is particularly flexible in that it can be employed with either nominal, ordinal or continuous datasets. Therefore, it is considered particularly suitable for linguistic-centric datasets, as in Participedia, in which multiple entries describe a variable. MFA capability of weighting variable dimensional contribution allows us to treat each variable considering the descriptive level attributes pointed out in Figure 1 (i.e., *Selection*, *Participation Mode*, and *Decision Output Procedure*).

HCPC (Lê et al., 2008) defines data clusters according to the MFA principal components. HCPC is also suitable for analysing prototypical categorisation. Indeed, through HCPC, it is possible to isolate specific clusters' structures and the membership score of each democratic innovation within each cluster. Ultimately, this allows individuating each cluster's most prototypical and most peripheral set of examples according to their distance to the cluster's epicentre. While each cluster represents a family of observations, their in-between relationship determines their unicity. In this regard, observations adjacent to the cluster epicentre have a unique taxonomical identity.

In contrast, observations that are equally distant to two or more clusters' epicentres area share some characteristics with other clusters. Regarding the prototype theory, the area adjacent to the epicentre determines the prototypical centre of each cluster, and the area equally distant to two or more epicentres determines the cluster periphery, in which the taxonomical identity is interchangeable with other clusters. This analysis is performed using the FactoMineR package in R (Husson, Josse, Le, Mazet, & Husson, 2016).

Results

MFA identified three dimensions with an eigenvalue above 1 ($\lambda > 1$). Overall, the MFA results reveal relative data variability. The first dimension of the MFA explains approximately 16.7% of the data variability, whereas the second and third dimensions explain approximately 9.7% and 7.4% of the data variability, respectively, with a total explained accumulated data variability of 33.7%. Here, the relatively low level of cluster variation is explained by the large number of variables employed in the analysis and the dataset complexity based on subjective data entry, which relatively lacks internal data stability.

The MFA results are then applied to HCPC to identify clusters of observations with similar characteristics. HCPC is performed using the Ward criterion to merge similar democratic methods into clusters, whereas the Euclidean distance is retained to locate cases into clusters.

In general, HCPC analysis highlights the presence of four clusters that are a subset of two main groups (Figure 2).

Each of these macro-clusters contains two other prototypical families, for a total of four clusters. HCPC also highlights the statistical characterisation of each cluster within the whole sample. Significantly different cluster peculiarities ($p < 0.05$ - Figures 3 and 4) refers to clusters' central prototypical categorisation specificity.

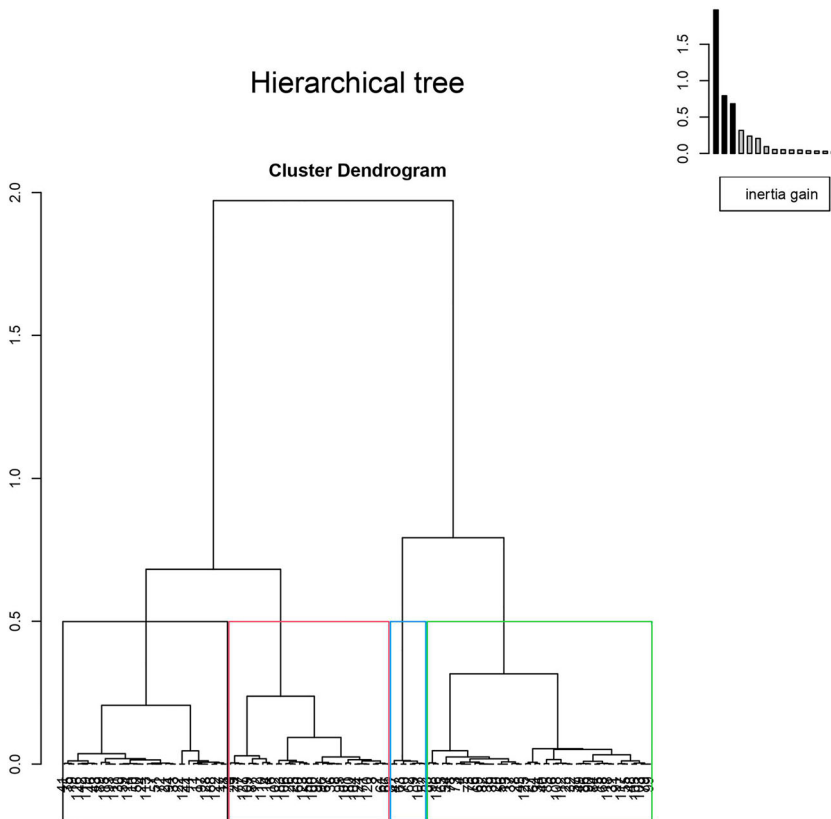


Figure 2. Hierarchical Cluster on PCA.

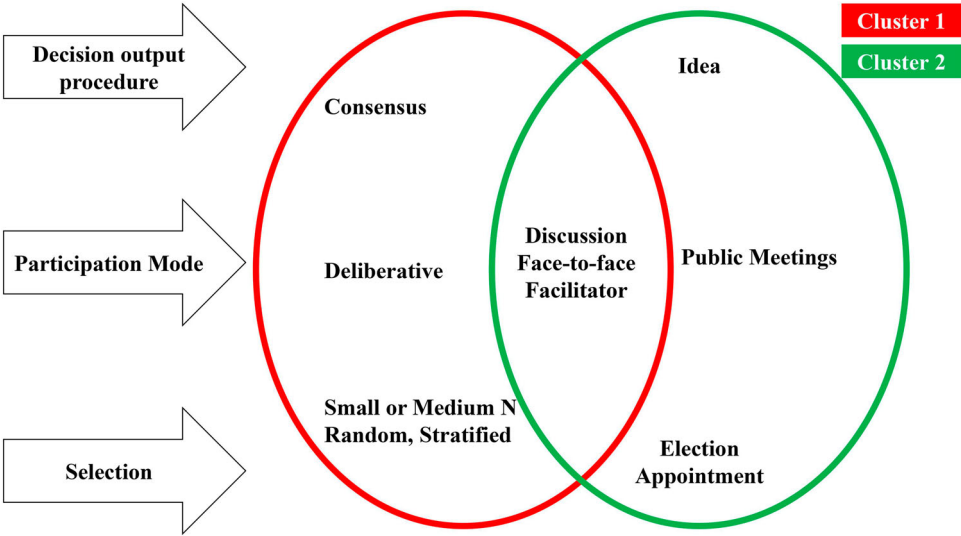


Figure 3. Cluster 1 and Cluster 2 characteristics.

Generally, HCPC highlights two broad differentiations:

- 1) The first differentiation, characterising C_1 and C_2 (red and green clusters in Figures 2 and 3), points to an active participatory component. Within this macro-dimension, we find a common characteristic that refers to a discursive, face-to-face mode of interaction with the support or presence of facilitators.
- 2) The second macro-differentiation, characterising C_3 and C_4 (turquoise and purple clusters in Figures 2 and 4), is characterised by a passive interaction with voluntary

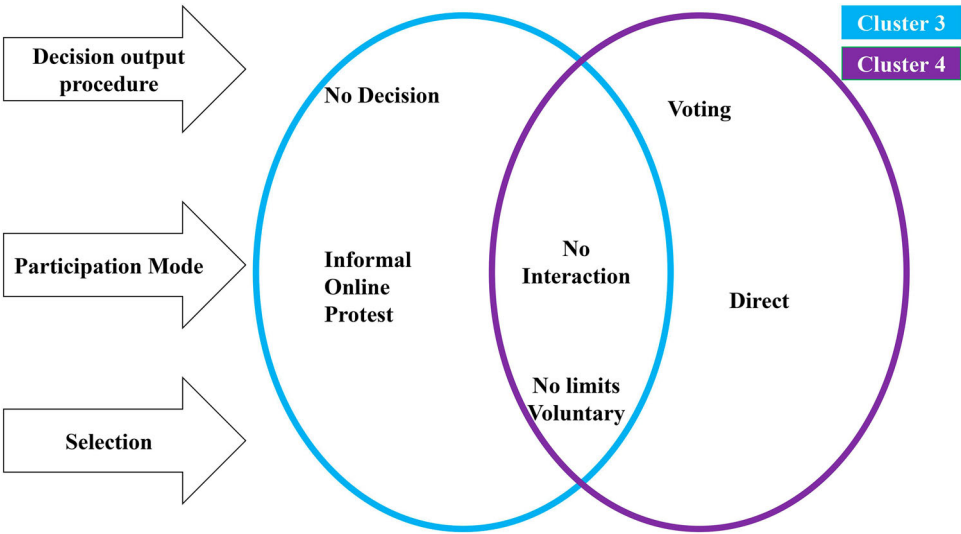


Figure 4. Cluster 3 and cluster 4 characteristics.

informal or no interactive participation. In passive participatory processes, participants express their opinions or perspectives through a passive mode of within-participant interaction.

The two macro-groups coincide with Della Porta's normative categorisation of passive and active participatory democratic practices (Della Porta, 2013). Specifically, as Della Porta (2013) identified, we can identify an *aggregative participatory* and *deliberative participatory* democracy. While *deliberative* and *participatory* democracy stress citizen-centric participation, deliberative practices are a talk mode of participation, whereas participatory practices include thin ways of citizen participation.

In more detail, given the significantly different cluster characterisations, we can label each cluster as follows:

- 1) Cluster 1 (C1) is the deliberative discourse-centric democratic innovation cluster. This cluster mainly finds deliberative forms of democratic innovation, such as citizen juries or citizen initiative reviews. Prototypical C1 cases refer to the core normative ideals of deliberative democracy. Within this cluster, democratic innovations are discourse-centric processes (in terms of within-participant interactions), and the decision outputs are usually based on consensus processes. In addition, within this cluster, reason-giving processes are central and considered a prerequisite for most participants. In this regard, democratic innovations within this cluster require the citizen's active participation in the sense that the citizens themselves is the generator of reason as intended by Gutmann and Thompson (1998) or Floridia (2014). The participants also usually adhere to the normative core features of deliberative democracy, such as random stratified selection and the requirement of a small-to-medium dimension to guarantee the population's representativeness and the participants' inclusion and engagement (Farrell et al., 2019).
- 2) Cluster 2 (C2) is the participatory talk-centric democratic innovation cluster. In this cluster, we find other forms of deliberative participatory innovations, such as worker councils, participatory budgeting and citizen participatory programs. This cluster is characterised by a talk-centric method of participation. Similar to the discourse-centric mode of participation, talk-centric participation requires the presence of active participants who express their perspectives during the democratic process. However, in contrast to discursive-centric participation, talk-centric participation does not necessarily have a reason-giving prerequisite for every single participant, nor does it provide the prerequisites for inclusive or authentic participation. Indeed, the methods listed in this cluster include assemblies of appointed or elected participants, which does not guarantee the inclusion of all socio-demographic groups within a polity. Their decision-making process is often aggregative, which tends to produce symbolic battles instead of reasoned and authentic dialogues.
- 3) Cluster 3 (C3) is the mass and non-decision making participatory democratic innovation cluster. This cluster regroups the largest number of democratic innovations listed in Participedia. This cluster finds action-centred practices such as crowdsourcing, community philanthropy, participatory grantmaking, protesting and picketing. All of these forms of democratic participation are characterised by heavy participation with little interaction between the participants. Concerning mass participatory innovations,

a large number of participants plays a central role in having an impact on polity. Democratic innovations within this cluster are characterised by the absence of a proper decision-output process. In this respect, the participants' role is not decisional but is mainly propositional on one specific claim. Here, for example, we can mention some forms of crowdfunding in which a solution has already been pre-proposed, and the participants have decided to contribute to such a specific solution. Similarly, it is possible to find various forms of protest actions, such as picketing or demonstrations, in which the participants are not called to decide but to advance claims.

- 4) Cluster 4 (C4) is the direct and vote-centric democratic innovation cluster. This cluster can find direct democratic, participatory practices, such as referenda and online voting. The presence of a decision-making process characterises the elements of this cluster. Since active participation is not required within this cluster, the participants express their preferences directly through voting procedures.

In general, prototypical examples allow us to draw and build upon new categorisations while considering their descriptive level. As such, while the active versus passive understanding of citizen participation characterises the two macro-cluster areas, within each cluster, the differentiation is more nuanced. Hence, the category of *who* participates

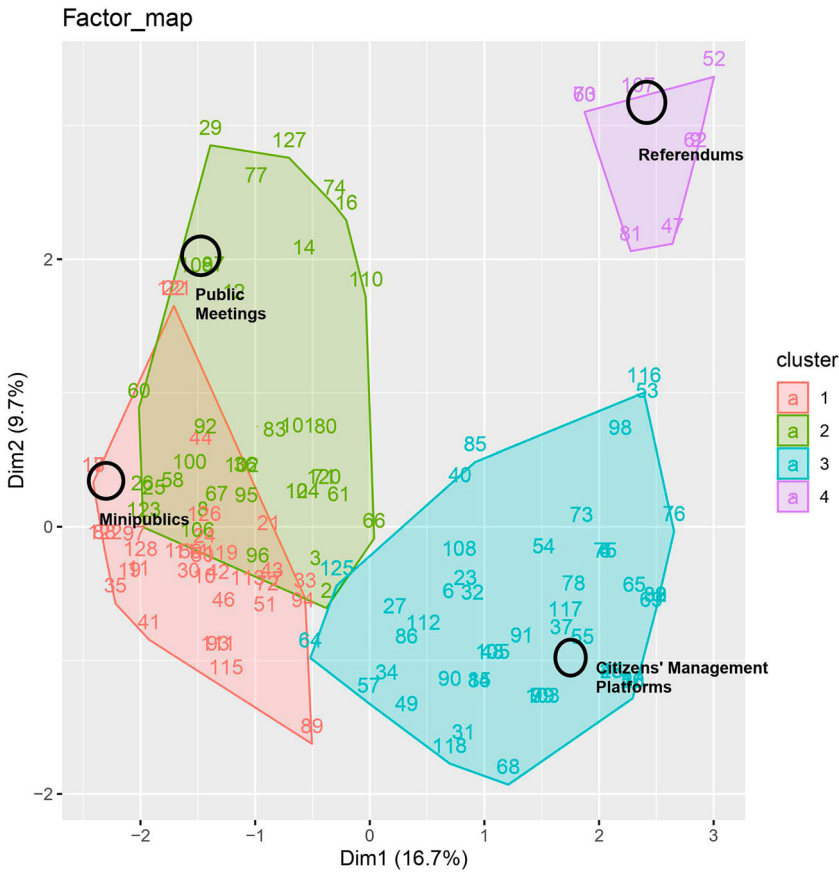


Figure 5. Central cases.

mainly differentiates the deliberative cluster (C_1) from the talk-centric participatory cluster (C_2). In contrast, the category of *how* people decide distinguishes the mass participatory cluster (C_3) from the direct democratic cluster (C_4).

Central Cases

Generally, the four clusters generated by HCPC allow us to identify the set of prototypical examples within each category (Figure 5).

As pointed out earlier, in MFA/HCPC, prototypical observations are located close to the cluster epicentre (the black circle in Figure 5). The prototypical examples within C_1 refer to deliberative mini-publics, such as citizen initiative reviews or Deliberative Pooling®. C_2 is characterised by a broad definition of public meetings, such as participatory budgeting or workers' councils. Notably, C_3 refers to mass participatory democratic innovations. While the epicentre is on citizens' management platforms, closed to the cluster's epicentre, we can also find other action-based participatory innovations such as participatory granting; forms of protest such as strike or picketing; or non-decision-making participatory tools, such as crowdsourcing and crowdfunding. Finally, the C_4 prototypical example lies in the direct democratic area of referendums\ or online voting, which is characterised by the absence of a deliberative arena (Veri, 2019).

Peripheral Cases

Generally, the literature on democratic innovations has focussed on ideal-typical formats by neglecting peripheral examples. Peripheral cases are not properly classifiable democratic innovations that fit within two or more clusters. Using a heuristic example to explain peripheral cases, we can refer to the relationship between platypuses and the family of mammals. Although platypuses are peripheral to the family of mammals, given their characteristics, they have many overlapping features with the *cluster* of birds. In this regard, considering only normative perspectives, in 1799, eminent British zoologist George Shaw considered platypuses as artificially made animals. This is because it was normatively impossible to think of an animal that has a beak, lays eggs and has mammary glands and hair. However, such animals empirically exist, and they are mammals with bird-like features. Essentially, while animals that have beaks and lay eggs, such as platypuses or echidnas, are theoretically remote from the family of mammals, they can be empirically inserted within such a family. Within this heuristic example lies the power of the prototype theory, which allows empirically categorising concepts without the issues of conceptual stretching.

Overall, our results reveal several peripheral cases, such as the practice of collaborative governance, traditional governance systems, world café processes or systems of local self-governance in rural areas, such as Panchayat Raj or community forestry.

By and large, as shown in Figure 5, the two most proximate epicentres refer to the deliberative and participatory clusters (C_1 and C_2). Indeed, between C_1 and C_2 epicentres we find a range of democratic innovations equally distant from both clusters' central cases. As displayed by Figure 6, cases density between more than two epicentres are relatively small, as the macro divide between C_1 - C_2 and C_3 - C_4 points to active versus passive mode of participation. In general, despite being theoretically marginal, peripheral cases

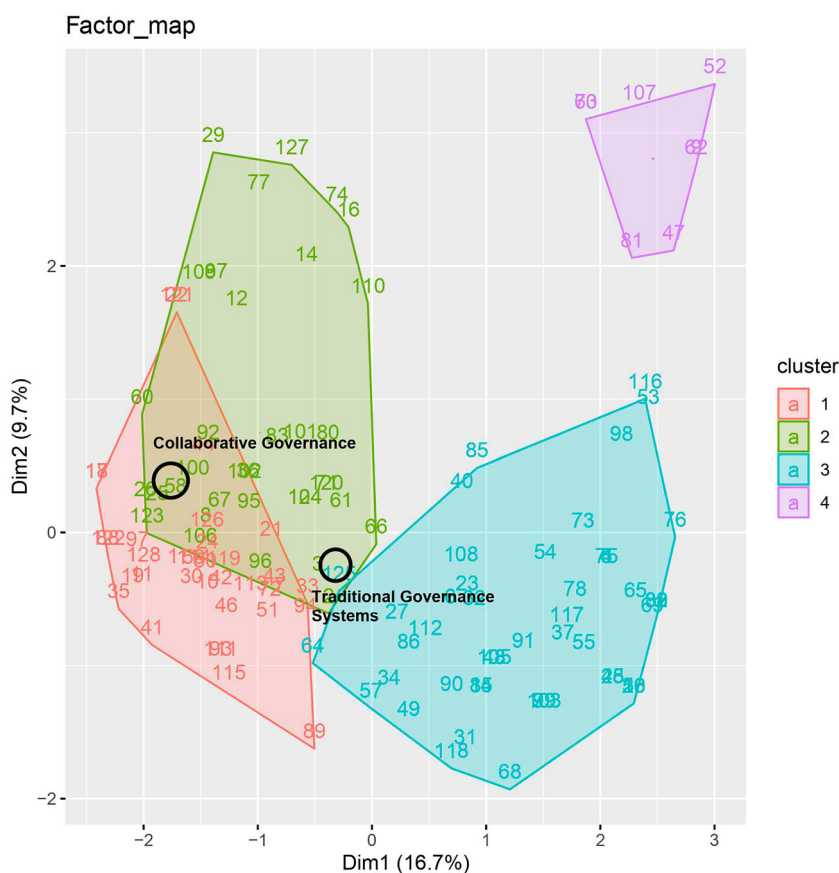


Figure 6. Peripheral cases.

demonstrate the great dynamic nature of democratic innovations, which tend to absorb and integrate features stemming from different clusters (Figure 6).

Overall, peripheral cases are characterised by two specific reasons.:

- First, as in our heuristic example of platypuses, cases with overlapping clusters have specificities that are characteristic of not only one cluster. This is the case for democratic innovations not conceptually separable into one categorisation that presents a multi-faced nature. In this respect, it is, for example, the innovation of *collaborative governance*, which is exactly located between the C_1 and C_2 epicentres. Collaborative governance is a compound democratic innovation with strong participatory representative instances- as the selection by appointment typical of C_2 - but also deliberative elements - as the discourse decision-making processes based on consensus, which typically characterised C_1 . Since platypuses are mammals with strong similarities to birds, *collaborative governance* is also a talk-centric form of democratic participation with strong similarities and deliberative clusters.
- Second, there is a context-based aspect that motivates clusters' overlapping. Contexts often transform the logical relationship between attributes. Hence, the attributes

that are characterised by a specific cluster can ‘work’ only when they are associated with the attribute of another cluster. A useful example here is the idea of a *Traditional governance system* which location is equally distant to C_1 , C_2 and C_3 . Although there are strong deliberative elements that characterise most of this type of governance with a discourse-centric mode of participation and consensual decision-making processes (as for C_1), its selection mode often falls into the participative cluster (i.e. C_2), which can be operated through appointment, election or self-selection, and its participatory mode can be considered large as it usually involves a big part of the society (as C_3 is mass participatory). However, it is worth noting that the traditional governance system’s ambiguous categorisation mainly depends on the cultural, geographic, historical and institutional context. Nevertheless, its multiple overlapping characteristics can be interchangeably connected within the deliberative or participatory cluster. Therefore, while voluntary participation does not necessarily indicate the inclusion of every socio-demographic component of a polity, within the traditional governance context, this *de facto* includes all the given components that are often implemented in small community contexts. This may also affect the mode of interaction and decision-making, which becomes more discourse-centric or consensual depending on the specific cultural context.

Discussion

This study proposes a novel comparative framework for analysing and approaching democratic innovations. Clusters are the universe in which different formats, processes or outcomes are located. In light of the earlier studies on the mapping of democratic innovations, this framework allows resolving the issues of conceptual stretching that tend to produce too narrow or overlapping categorisations. Within the proposed framework, formats such as referenda, e-democracy, participatory budgeting, mini-publics and even collaborative governance become a single point of the universe of democratic innovations.

Another element highlighted in this study is the redundancy of certain attributes that have previously been employed to characterise democratic innovations. Despite being normative-driven, earlier taxonomical approaches suffer from overfitting, which *de facto* results in a low level of abstraction. Here, it is worth mentioning the attribute of virtual or online processes, which has been considered by Smith (2009) as definitional of a specific format. However, this definitional category becomes particularly outdated when considering the ongoing social transformation imposed by the COVID-19 pandemic. Indeed, the exponential increase observed in online communication, which has become the mainstream over the last 24 months of government lockdowns, has become transversal and not ideal-typical of several democratic innovations.

A third element worth highlighting is the different levels of importance of defining democratic innovations. For example, Geissel (2013) considered the direct democratic process a standalone category. It is empirically peripheral to two clusters of participatory processes involving active interactions between participants or more or less reason-

giving processes. In this case, we can allude to the idea of the democratic innovation universe, in which a single process is not central or definitional of an entire category.

Finally, from an empirical perspective, each cluster is understood as a cloud of democratic innovations with a central and a peripheral dimensional understanding. In fact, a cluster-categorical approach proposes a trans-format understanding of democratic innovation, in which formats are located within a cluster-dimensional frame according to their degree of membership. This prototypical versus peripheral understanding of classification potentially enlarge the domain of democratic innovation systematic comparability. For example, through the suggested framework, it would be possible to investigate and compare within-cluster cases considering possible tension between central and peripheral cases and their similarities considering their functional instances.

Conclusion

This is the first study providing a bottom-up categorisation of democratic innovations and a systematic mapping of the Participedia dataset. Generally, prototype categorisation allows identifying the core of each category. However, categorical overlapping occurs at the periphery of clusters and often depends on the context-based definition of democratic innovations. In this study, we identified four clusters that are characterised by little conceptual stretching and omission.

This categorisation strategy has potential within comparative research design and theory building. Indeed, from the perspective of comparative research design, it is now possible to empirically stimulate larger analyses across a different form of democratic innovation within and between clusters. From a comparative perspective, we clarified the descriptive attributes of *how* and *who* participates within different democratic innovations. This clarification is considered central in causal hypotheses generating theories (Goertz & Mahoney, 2005) because these descriptive elements might have a causal function in the explanations (Maggetti, Radaelli, & Gilardi, 2012). As such, we can, for example, test the cardinal role of *how many* participate versus *who* participates in the prediction of the political efficacy, political impact or political legitimacy of a respective democratic innovation, not only by investigating a restricted number of formats but also by extending our investigation to a different set of formats and processes.

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