Chapter 2
Deliberative and Epistemic Approaches to Democracy

Abstract Deliberative and epistemic approaches to democracy are two important dimensions of contemporary democratic theory. This chapter studies these dimensions in the emerging ecosystem of civic and political participation tools, and appraises their collective value in a new distinct concept: linked democracy. Linked democracy is the distributed, technology-supported collective decision-making process, where data, information and knowledge are connected and shared by citizens online. Innovation and learning are two key elements of Athenian democracies which can be facilitated by the new digital technologies, and a cross-disciplinary research involving computational scientists and democratic theorists can lead to new theoretical insights of democracy.

Keywords Deliberative democracy · Epistemic democracy · Semantic web · Institutions · Participatory ecosystems

2.1 Introduction

Semantic Web engineers have often complained that building ontologies is hard. To build an ontology for a given domain—for example, tort law—one needs to recruit experts in that domain, elicit their legal knowledge, and then reach a shared, explicit consensus of how such legal knowledge will be represented and formalised so that computers can 'understand it'. It is not an easy task, indeed, especially if ontologies have to be designed from scratch and the subject matter is complex.

If it is hard to build ontologies, mapping the conceptual domain of deliberative and epistemic theories of democracy is not less harder. In fact, it is quite the opposite. In the last thirty years, political philosophers and scientists have produced an oceanic body of literature on the justification, mechanisms, and outcomes of democracy based on a number of procedural and cognitive arguments. They have done so at different levels: normative (discussing the foundational values), theoretical (formulating hypothesis), and empirical (developing case studies and testing new institutional arrangements). Successive generations of scholars have expanded,

refined, or remixed their different approaches with extraordinary sophistication. As a result, any attempt to represent the domain of contemporary models of democracy will necessarily be limited and selective. Like the making of the 19th century Oxford English Dictionary, or the 21st century Wikipedia, the effort would require the involvement of hundreds if not thousands of dedicated volunteers.

This chapter will take an oblique route by briefly considering the debates in democracy theory over the last decades that have explored the meaning and practice of democratic participation. The discussions about the role of citizen participation are sometimes structured into a binary between 'procedural' and 'epistemic' accounts of democratic practice, or, with a different terminology, between 'majoritarian' and 'populist' approaches. Hélène Landemore has proposed a more expressive dichotomy: the 'talkers' and the 'counters' (Landemore 2013, 53).[1] The 'talkers' walk the path of 'deliberation followed by majority rule as a fallible but overall reliable way to make collective decisions'; the 'counters' explore 'the epistemic properties of judgement aggregation when large groups of people are involved' (Landemore 2013, 54–55). Yet, an analysis of the most recent literature will reveal that subsequent debates have reconciled aspects of these two positions as the impact of empirical research, developments in cognitive sciences and digital technologies have opened up new research questions.

In this chapter we will focus on the alignment between deliberative and epistemic democratic theory and practice in order to consider, in Chap. 3, the varieties of wider citizen participation promoted by digital platforms which, interestingly enough, are typically agnostic about these philosophical debates. The findings of both deliberative and epistemic theories will help us to develop a matrix of civic and political participation tools and will guide further research into technology-enabled democratic participation. From this standpoint, we will consider how our notion of 'linked democracy'—as a distributed, technology-supported collective decision-making process—can provide a framework to structure the current plurality of civil and political participation practices. Linked democracy is about turning this plurality into a participatory ecosystem where data, information, and knowledge are connected and shared. Drawing from the experience of both 'talkers' and 'counters', we will suggest that 'connectors' are also needed to make the most of distributed crowd intelligence. As Josiah Ober has shown with his insightful analysis of classical Athens, 'making good use of dispersed knowledge is the original source of democracy's strength' (Ober 2008a, 2). Our 21st century democracies have challenges that were absent in classical Athens, and scale is notably one of them. Yet, our democracies have tools to address them that are truly unique 21st century innovations. And both the similarities and the differences are fascinating to explore.

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[1]As Landemore's book acknowledges Jacob Levy for suggesting this very decipherable dichotomy to her, we want to preserve the attribution chain and thank him as well.

2.2   Deliberative Approaches to Democracy

In the early 1990s, political theorists began to suggest an expanded role for citizens in democratic processes based on the principles of public deliberation (Benhabib 1996; Bohman 1996; Dryzek 1994; Estlund 1993, 1997). The so-called 'deliberative turn' went beyond an acceptance of democratic practice as the simple aggregation of voter preferences for representatives at elections. It was argued that 'deliberation' through public and individual reflection and dialogue should inform and transform voter preferences or judgments and thus collective decision-making. Deliberation is about 'processes of judgment and preference formation and transformation within informed, respectful, and competent dialogue' (Dryzek and Niemeyer 2010, 2). The ideal is that 'inclusive, non-coercive and reciprocal discussion' on relevant issues should influence 'individual preferences and shape public policy' (Kuyper 2015). Public deliberation by 'free and equal' citizens provides legitimation for political decision-making, therefore, justifications for proposed decisions, policies and laws need to be publicly given and debated to inform the voting public. This does not render voting (or the aggregation of preferences) as meaningless but situates it as 'a phase of deliberation' in a democratic process (Bohman 2009, 28).

The concept of deliberation is already present in Aristotle's writings and, according to Christian Koch, both deliberation (boulē, bouleusis) and deliberate choice (proairesis) are the key notions that 'link Aristotelian rhetoric, ethics, and politics together' (Koch 2014, 13).[2] Generally, Jensen Sass and John Dryzek (2014) acknowledge that 'deliberation' as a political concept extends from Athens to contemporary Western liberal democracies. While the modern literature on deliberative democracy offers many definitions of the term, Hélène Landemore notes that "the reasoning aspect of exchange of arguments" in Aristotle's deliberation resonates in the definition by Joshua Cohen (one of the early proponents of deliberative democracy), the 'public use of arguments and reasoning' (Cohen 1989, cited in Landemore 2013, 91).

Since the first formulations of the 'deliberative turn' in democracy theory, there have been a number of overlapping turns within the turn. As John Dryzek and Simon Niemeyer have synthesised, an 'institutional turn' has focused on small-scale deliberative forums; a 'systemic turn' has instead reflected on large-scale systems; a 'practical turn' has bridged the gap between deliberative democracy and real politics and, finally, an 'empirical turn' aims at refining the theoretical claims with empirical

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[2]"Deliberation is the kind of reasoning that precedes deliberate choice, for which Aristotle's term is proairesis (…). Proairesis literally means 'taking something rather than (something else)'. What makes these concepts so important to Aristotle's ethical thinking is that the individual's deliberate choices are what primarily determines that individual's ethical worth. Rhetoric, however, is also about deliberate choice, but of a different kind, i.e., collective choices by people organized in groups like the polis. (Koch 2014: 13).

testing (Dryzek and Niemeyer 2010, 6–10). More recently, Stephen Elstub (2015) and Jonathan Kuyper (2015) have identified three similar turns or generations of deliberative democracy theories. Elstub distinguishes between (i) normative foundations as set by Habermas (e.g. 1985, 1991) and Rawls (1999, 2001); (ii) institutionalisation of deliberative democracy with inclusion of other types of communication beyond public reason (e.g. Bohman 1996; Gutmann and Thompson 1996; Sanders 1997; Young 2000), and (iii) empirical turn and institutional design (e.g. Dryzek 1994, 2002, 2006, 2010, 2013). Elstub also anticipates a fourth generation inspired by the leading work of Jane Mansbridge and John Parkinson on large-scale deliberative systems (Mansbridge and Parkinson 2012) and argues that, by becoming more pluralistic and fragmented, deliberative democracy has become much less distinctive as a theory but, at the same time, is adaptive to change in ideas and interpretations (Elstub 2015, 101). Similarly, Jonathan Kuyper considers the works of Jürgen Habermas and Joshua Cohen that explore the ideals of deliberative democratic practice as the first stage; in the second stage, research focuses on 'empirical and practical applications' to mediate theoretical positions with the realities of liberal democracies and to test claims for deliberative practices; in the current third stage, there is an attempt to accommodate the values as well as the means and ends of deliberative democracy into large-scale systems to develop a 'system-wide' model. Following the framework set by Mansbridge et al. (2012), Kuyper also suggests a system-wide model with many discrete but interconnected components cohering into a complex whole and proposes a 'division of epistemic labor' (Kuyper 2015, 55). Based on the assumptions that—no individual citizen is knowledgeable about all relevant issues, and has diverse interests and priorities as well as discrete areas of expertise—the model proposes that citizens can self-select or exit from a wide-range of discussions, polls, panels and problem-solving arenas. A high level of knowledge and competence amongst citizens is not a prerequisite for participation as epistemic diversity serves to address individual bias and enhance individual knowledge levels. In addition, non-deliberative events have an 'augmenting' or disruptive role and can contribute indirectly to a citizen's learning and decision-making ability. The primacy of 'rational deliberation' is downplayed in favour of 'layered deliberation' that accommodates a range of styles and levels as well as multi-site deliberation (Kuyper 2015, 60). Likewise, in a revision of previous models positing more restrictive definitions of deliberation (e.g. Dryzek and Niemeyer (2010) requiring authentic, inclusive and consequential components) Sass and Dryzek (2014) also seek to extend the notion of deliberation onto a cross-cultural landscape and identify examples in non-western contexts of practices that they consider 'deliberative', but not necessarily consequential. This extended coverage also reveals how influential the deliberative paradigm and its multiple forks remain after more than two decades, inspiring institutional innovations that are currently deployed across the world.

2.2.1 Deliberative Democracy in Action: Some Institutional Innovations

The empirical turn in deliberative democracy has sparked a number of institutional innovations that are currently being deployed and replicated at different levels of governance in many democratic countries. These innovations, usually referred to as 'mini-publics' (Goodin and Dryzek 2006; Geissel and Newton 2012; Gröndlund et al. 2014), involve randomly-selected microcosms of citizens that are convened to deliberate on public issues.[3] As Robert Goodin and John Dryzek put it, mini-publics are 'designed to be groups small enough to be genuinely deliberative, and representative enough to be genuinely democratic (though rarely will they meet standards of statistical representativeness, and they are never representative in the electoral sense)' (Goodin and Dryzek 2006, 220).

The expression 'mini-publics' is an umbrella term that covers a variety of deliberative entities, some of them already in place before the 'deliberative turn'. As Gröndlund et al. note (2014, 2), Citizen Juries (in the US), Consensus Conferences (in Denmark) or Planing Cells (in Germany) have existed since the 1970s, while Deliberative Polls © (DP) and 21st Century Town Meetings © are newer designs. In their review of definitions of mini-publics, Matthew Ryan and Graham Smith distinguish between (i) restrictive definitions focusing exclusively on Deliberative Polls (Fishkin 2009); (ii) intermediate definitions including citizens' assemblies, citizen juries, planning cells, consensus conferences, and 21st Century Town Meetings (Goodin and Dryzek 2006); and (iii) expanded definitions that cover participatory budgeting and community meetings (Fung 2003; Ryan and Smith 2014, 12). In a previous account, Graham Smith also distills the common design features of 'mini-publics': (i) use of random or quasi-random sampling techniques (sortition); (ii) short-time events (typically 2–5 days, with the exception of longer citizens' assemblies); (iii) facilitation of the debates by moderators in order to ensure procedural fairness; (iv) cross-examination of expert witnesses presenting evidence to citizens; (v) deliberation in plenary and/or small-group sessions (Smith 2012, 90). Likewise, most of them (although not DPs) may conclude with a report that summarises a number of recommendations to the convenors (Smith 2012, 91).

Let us briefly examine Deliberative Polls, which in the words of Mansbridge are 'the gold standard of attempts to sample what a considered public opinion might be on issues of political importance' (Mansbridge 2010, 53). The idea of DPs was initially conceived by James Fishkin in 1987 during his stay at the Stanford Center for Advanced Study in the Behavioral Sciences and went live one year later in the form of a 'National Issues Convention' broadcasted on a PBS television program

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[3]In *After the Revolution*, political scientist Robert Dahl proposed to 'seriously consider restoring that ancient democratic device [lot] and use it for selecting advisory councils to every elected official of the giant polyarchy' (1970, 122–123) and, later on, he suggested the idea of deliberative 'mini-populi' in *Democracy and Its Critics* (Dahl 1989, 342).

(Fishkin 2009, x–xi). The process followed in DPs is best explained by Fishkin himself as he describes the election of the PASOK's (Greek Socialist Party) official candidate for mayor of Marousi (metropolitan Athens) in June 2006:

> First a random sample of a population (in this case eligible voters) responded to a telephone survey, then they were convened together for many hours of deliberation, both in small groups and plenary sessions, directing questions developed in small groups to competing candidates, experts, or policymakers in the plenaries, and then, at the end of the process, they filled out the same questionnaire as the one they had been given when they were first contacted in their homes. In this case, the questionnaires were supplemented with a secret ballot in a separate polling booth because the process was more than a poll. It was an official decision. (Fishkin 2009, 10)

To Mansbridge, DPs are 'are strongest in representativeness, very strong on outcome measurement, and equal to any other in balanced materials, policy links, and the quality of space for reflection' (Mansbridge 2010, 53). However, as governments, large foundations, or the media industry are the usual funding sources for DPs they also tend to 'not provide the deliberators with radical left or right alternatives that are not within the currently feasible political process' (idem). Relying on a previous typology of mini-publics (Elstub 2014), Marit Böker and Stephen Elstub argue that 'of the different types of mini-publics, DPs allow the least citizen control and decision making impact. Indeed, rather than opening up a space in which citizens can voice critique, the rationale for DPs typically focuses on changing, almost correcting, participants' views' (Böker and Elstub 2015, 134). The authors also review DPs and other mini-publics in the light of the selection method, activities, outputs and recipients of the outputs, and conclude that 'of the most common types of mini-publics, CCs [Consensus Conferences] and CAs [Citizen Assemblies] tend to have the greatest emancipatory potential based on these features, whereas DPs so far seem to have had the least' (Böker and Elstub 2015, 136).

Generally, DPs and other mini-publics have also been critically scrutinised from the point of view of legitimacy (even if they aim at greater representativeness, mini-publics have no delegate power and can't speak on behalf of the broader population), legitimation of intended policies, and misuse (of the process or the outcomes by the authorities that set the consultation process).

Without precluding the value of mini-publics for research or a variety of public purposes (such as influencing public debate), Cristina Lafont has recently challenged Fishkin's approach to DPs as a shortcut, proxy, or second best for realising the ideal of quality deliberation, yet at the expense of mass participation. Fishkin's approach is designed to tackle what he refers to as the 'trilemma of democratic reform': is it possible to design constitutional reform processes that are able to satisfy simultaneously the three key democratic principles of political equality, mass participation, and deliberation? To date, Fishkin acknowledges, any system attempting to fulfill any of two principles inevitably misses the third: political equality and mass participation deny deliberation (there are no incentives to consider competing arguments); deliberation and mass participation deny political equality (participants may be self-selecting and not representative); political

equality and deliberation deny mass participation (numerically impossible). The 'trilemma' is that all three principles cannot be achieved simultaneously (Fishkin 2011, 248). For Fishkin, deliberative microcosms (and DPs in particular) operate as a remedial modality to address these tensions, the rationale being—if a microcosm were chosen on the same principles of random survey participants, it offers a scaled version of a deliberative polity that is generalizable to the wider population. It is this scaled version that raises Lafont's concerns. First, following a previous point made by Parkinson (2006), she argues that members of deliberative microcosms 'participate as individual citizens with total freedom to express whichever views and opinions they have and to change them in whichever way they see fit. But, for that very same reason, they are in no way accountable to citizens outside the poll group' (Lafont 2015, 52). Second, Lafont suggests that 'deliberative democrats should welcome the proliferation of empirical research on micro-deliberative innovations, so long as it is not accompanied by the proliferation of the normative view that mass participation in quality deliberation is optional or dispensable for the realization of deliberative democracy' (Lafont 2015, 59).

However, and from a sociological perspective, Caroline Lee makes the opposite claim. In her book *Do-it-yourself democracy*, an account of a five-year fieldwork research on participatory processes in the US, she points out the pitfalls of what she refers to as 'the expanding market for public participation' and the role of engagement experts and facilitators (Lee 2015, 4). While recognising the positive effects of public participation events, she also argues that these may be only short-term, leading to the paradox of 'how public engagement can be authentically real and disempowering at the same time' (Lee 2015, 29) as the demands on citizens' time and commitment are not matched with actual impact on decision making and public policy.

Despite the generally admitted shortcomings of mini-publics when it comes to meet the normative, aspirational standards of deliberative democracy, there is a widespread agreement about their empirical value or the role they play in refining the theoretical underpinnings of the deliberative paradigm. For example, for Böker and Elstub 'mini-publics have been the democratic innovation from which the majority of empirical evidence on deliberative democracy has derived' (Böker and Elstub 2015, 130). Embracing the recent 'systemic turn', Böker and Elstub conclude that 'the systemic perspective that promises to subject future experimentation with mini-publics to a dynamic democratic momentum marks nothing less than the cutting edge of recent deliberative democratic theory' (Böker and Elstub 2015, 140). The steps that Böker and Elstub propose are:

> First, mini-publics can be evaluated and re-designed towards greater citizen control over the process, more open types of outputs, and more direct channels to formal decision-making. Second, the practice of mini-publics ought itself to be subjected to bottom-up deliberative processes. By conceptualising mini-publics as part of an overarching network of deliberative exchanges that evaluate and respond to one another, the emphasis shifts towards the establishment of a generally more active, transparent, and democratic system, whose ongoing evolution need not depend on top-down steering and control. (Böker and Elstub 2015, 140)

In a similar vein, Kuyper has also proposed a system-wide model with many discrete but interconnected components cohering into a complex whole and proposes a 'division of epistemic labor' (Kuyper 2015, 55). To be sure, the system-wide model of deliberation provides a conceptual conduit towards the research that has considered the nature and impact of 'collective intelligence' and 'distributed knowledge' and the role of networked public spaces in political decision-making. In the next section we review the arguments mobilised by contemporary theorists of epistemic democracy that have re-interpreted 'epistemic' in light of a new research emphasis on distributed knowledge and collective intelligence.

2.3 Epistemic Approaches to Democracy

The contemporary origins of epistemic approaches to democracy are interweaved with those of deliberative democracy and, in fact, they have evolved in the same way. The dichotomy between 'talkers' and 'counters' might eventually be more apparent than real as the two paradigms diversify and overlap. This may create some confusion to readers. For example, Joshua Cohen is often quoted as one of the leading proponents of deliberative democracy but his seminal 1986 paper is titled 'An epistemic conception of democracy'. In this paper, Cohen presents 'an epistemic interpretation of voting' with three components: '(1) an *independent standard* of correct decisions—that is, an account of justice or of the common good that is *independent* of current consensus and the outcome of votes; (2) a *cognitive* account of voting—that is, the view that voting expresses beliefs about what the correct policies are according to the independent standard, not personal preferences for policies; and (3) an account of *decision making* as a process of the adjustment of beliefs, adjustments that are undertaken in part in light of the evidence about the correct answer that is provided by the beliefs of others.' (Cohen 1986, 34). Cohen, however, would eventually abandon this explicit formulation, and hence the potential confusion. Melissa Schwartzberg has helped to clarify this issue by noting that 'as Cohen wrote the essay he had become skeptical about the idea that democracy was fundamentally about aggregating opinions about the content of the 'independent standard' (Schwartzberg 2015, 189).

Another issue about the 'independent standard of correctness' is that there are different versions of this core theoretical tenet in the epistemic democracy literature. As David Estlund explains, 'one version might say that there are right answers and that democracy is the best way to get at them. Another version might say that there are right answers and there is value in trying collectively to get at them whether or not that is the most reliable way. Yet another: there are no right answers independent of the political process, but overall it is best conceived as a collective way of coming to know (and institute) what to do. There are others' (Estlund 2008, 1). The more pragmatic approaches to the standard seem to have prevailed, though. Jack Knight has recently conceded that 'there's a growing number of people who probably think that getting at 'the truth' is too strong a claim to make for democratic

institutions, but who do think that democracy has epistemic value in producing better decisions. Here the 'better decisions' would mean the enhancement of democratic decisions through discussion' (Knight et al. 2016, 138). Knight's last sentence also offers an additional clue by highlighting the role of deliberation in the contemporary epistemic approaches. In her account, Schwartzberg states that epistemic democracy emerged as a response to social choice theory to defend 'the capacity of 'the many' to make correct decisions' (Schwartzberg 2015, 187–188) and remarks that 'epistemic democracy does not position itself as an alternative to deliberative democracy but instead generally resituates deliberation as instrumental to the aim of good, or correct, decision making' (Schwartzberg 2015, 189).[4] Similarly, Landemore argues that 'epistemic democracy is both a subset of deliberative democracy and goes beyond it because it includes things that deliberative democracy doesn't necessarily include' (Knight et al. 2016, 142). According to Landemore, the epistemic models aim "to emphasize the knowledge-producing properties of democratic institutions and procedures; and specifically (…) to assume that those procedures are good at tracking a procedure-independent standard of correctness, which is sometimes called 'truth'" (Knight et al. 2016, 141).

Most contemporary epistemic democrats, in short, assume an independent standard of correctness in their models, but they do so in different ways. Depending on how it is formulated, democratic decision making will produce 'true', 'right', 'good', 'correct' or 'better' outcomes (provided that appropriate mechanisms are in place, as we will see). Regardless of the tonality that the standard adopts, it is hardly surprising if this is the cause of major theoretical debates. Can we rely on independent standards of what is true, or right, or good, or better, when diversity of opinions, values, and interests are the fabric of our plural democracies? If that is the case for some questions (let us say, questions involving core democratic principles or values) but not for others, how do we discern between them? As Schwartzberg put is, 'there may not be such an independent standard of correct decisions—or if such standard exists, we might not have any way of knowing whether we had reached it.' (Schwartzberg 2015, 198). Or, alternatively, in Landemore's view, it is possible for epistemic-democratic theories to 'conceptualize the truth, goodness, or correctness of democratic decisions or solutions' through diverse options: 'you can conceptualize it in terms of good governance, human rights, social justice, perhaps a developmental index, a happiness index or something like that, or something else entirely.' (Knight et al. 2016, 143). From this perspective, political scientists and social sciences in general could contribute to measure those achievements even though, as Nadia Urbinati objects, 'the measurement is always open to judgment and my judgment can be different from yours because in the domain of political

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[4]In a similar vein, Estlund acknowledged that group dynamics could produce 'pathologies' leading to catastrophic decisions and insisted that this could mediated by 'proper deliberative procedures' and decision evaluation (Estlund 2008: 2). Ron Levy also suggests that the binary tensions that result from counterposing different governance models are 'to some extent illusory' as some accommodations can develop models which simultaneously encourage procedures, participation and deliberation (Levy 2013, 355).

opinion we don't have a mathematical measurement after all' (Knight et al. 2016, 149). The lack of conclusive answers or still insufficient empirical support leads Schwartzberg to conclude that epistemic democrats 'may wish to temper the strength of their claims' and that 'relinquishing the independent standard of correctness ought to be a first step' (Schwartzberg 2015, 201).[5] Ultimately, this more tempered approach seems to permeate Landemore's response to the criticism that it is difficult to ascertain whether a decision is good or not at the moment it is made: 'In the here and now, at time T—the time of the decision—your only alternative is to involve one, few, or many people in the decision procedure. All I'm saying is that at time T you'll likely better off with the decision that involves the greatest number of people.' (Knight et al. 2016, 146). In this nuanced account, the focus is now placed on the mechanisms of aggregation of preferences and, particularly, on exploring the conditions under which hypotheses such as 'more is smarter' (Landemore 2012a, 265) or 'it is often better to have a group of cognitively diverse people than a group of very smart people who think alike' (Landemore 2012a, 260) can be successfully tested.

2.3.1 Some Mechanisms of Aggregation in Epistemic Approaches

The epistemic-democratic literature explores a number of mechanisms that can support the argument for the epistemic properties of aggregation. The most popular are the Condorcet Jury Theorem (CJT) and its different variants and, most recently, the 'miracle of aggregation' (e.g. Converse 1990; Surowiecki 2004), and the Diversity Trumps Ability (DTA) theorem by Hong and Page (2004). Let's briefly review the three of them.

The Jury Theorem proposed by Condorcet in 1785 draws from the law of large numbers and applies to issues that offer only two options, with one correct answer. There are a number of variants of the CJT, including a generalisation of the theorem from majority voting over two options to plurality voting over many options (List and Goodin 2001). As Landemore presents it in its standard formulation, the majority of voters will be "virtually certain to track the 'truth'" if three conditions are met: '(1) voters are better than random at choosing true propositions; (2) they vote independently of each other; and (3) they vote sincerely or truthfully' (Landemore 2012a, 265). The CJT has been largely scrutinised for its 'value for democratic theory'. For example, David Austen-Smith and Jeffrey Banks first

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[5]Alternatively, Schwartzberg proposes a more limited, 'deflationary model' that denominates 'judgment democracy': 'Like most epistemic democrats, judgement democrats would agree that individuals' beliefs should derive from deliberation, while emphasizing the value of aggregation as a means of affirming each individual's dignity. (…) In doing so, the judgement model evinces the respect for citizens than epistemic democrats have long displayed. But it does so without the yoke of an implausible an unachievable independent standard.' (Schwartzberg 2015, 201).

questioned the assumption of voters' sincerity as in a number of models since voting failed to be informative and rational; instead, they suggested that 'the appropriate approach to problems of information aggregation is through game theory and mechanism design, not statistics' (Austen-Smith and Banks 1996, 44). Also using a formal demonstration, Franz Dietrich and Kai Spiekermann have contended that the 'asymptotic conclusion' of the CJT (the probability of a correct majority decision converging to one as the group size tends to infinity) is questionable: 'If the asymptotic conclusion applied directly to modern democracies with their large populations, these democracies would be essentially infallible when making decisions between two alternatives by simple majority' (Dietrich and Spiekermann 2013, 88). Dietrich and Spiekermann tackle one of the most significant concerns in the CJT literature—the potential violation of voters' independence via exchange of information and deliberation—and note that it is 'not always obvious whether deliberation overall increases or decreases dependence, another reason why the classical CJT literature struggles so much with deliberation' (Dietrich and Spieckermann 2013, 106). Their proposal consists on a new notion of independence, based on causal networks models, where deliberation not only does not undermine independence but also augments voters' competence: 'Consequently, a group of deliberating economists may perform better because they are more likely to face decisions they tend to get right, while isolated economists may not' (Dietrich and Spieckermann 2013, 106). Whereas this model reconciles deliberation and competence with epistemic arguments for democracy based on jury theorems there is still, as Schwartzberg notes, a lack of systematic testing of these models and thus empirical evidence to demonstrate how judgements are achieved as well as their epistemic value (Schwartzberg 2015, 195–197).

The 'miracle of aggregation' is another application of the 'law of large numbers' evident in different models. A simple explanation is the one offered by Marc Keuschnigg and Christian Ganser: 'the central tendency of a set of independent estimates represents the truth more closely than the typical individual estimation' (Keuschnigg and Ganser 2016, 1). Landemore reviews three versions of this model, which she denominates 'elitist', 'democratic', and 'distributed'. The first version is labeled as 'elitist' as it relies on the presence of 'informed people' in the group to arrive at a 'right answer' and thus is a form of 'elite' extraction. In the second 'democratic' version by Page and Shapiro (1992) no elite has the right answer and everyone is roughly correct (the errors cancel each other and the collective decision is more accurate than the individual guesses). In the 'distributed version', instead, 'the right answer is dispersed in bits and pieces among many people' (Landemore 2012a, 267). The objections that Landemore raises to these 'miracle of aggregation' versions regarding their relevance for democratic theory are twofold: (i) concern about the assumption of independence of individual judgements (as with the CJT); and (ii) empirical defeasibility of the hypothesis of random or symmetrical distribution of errors (Landemore 2012a, 268).

The third mechanism, the 'diversity trumps ability theorem' (DTA) was first formulated by Hong and Page (2004) and later discussed extensively in Page's book The Difference (2007). The DTA model focuses on 'functional diversity'

('differences in how people encode problems and attempt to solve them') and identifies the conditions under which 'when selecting a problem-solving team from a diverse population of intelligent agents, a team of randomly selected agents outperforms a team comprised of the best-performing agents' (Hong and Page 2004, 16386). In other words, 'random collections of intelligent problem solvers can outperform collections of the best individual problem solvers' (Page 2007, 10). The conditions (slightly modified in the 2007 version of the DTA) are that: '(1) The problem must be difficult; (2) the perspectives and heuristics that the problem solvers possess must be diverse; (3) the set of problem solvers from which we choose our collection must be large; and (4) the collection of problem solvers must not be too small' (Page 2007, 10). In a recent replication of the DTA model, Keuschnigg and Ganser have found a particular case where 'ability' remains relevant: 'in determining collective accuracy, diversity is crucial only in large groups and/or in cases of aggregation via averaging. Hence, if forced to plurality vote in a small group—which is often the case in decision-making committees in both firms and public administrations—the electorate must contain highly competent individuals' (Keuschnigg and Ganser 2016, 8). The DTA theorem, nevertheless, has been criticised from different angles. Abigail Thompson has rebutted the mathematical proof provided by Hong and Page and states that, under the proposed conditions, randomness, and not diversity, is what trumps ability (Thompson 2014). In another exposition of the theorem, John Weymark has noted that DTA does not apply in situations involving binary choices and, when there are more than two options to choose from, the assumption about non-strategic behaviour (decision makers sharing information truthfully) may be as questionable as it is with CJT. He concludes by suggesting caution, for DTA 'offers no comfort to those who want to use it to argue for the collective decision to be made by an inclusive set of individuals rather than by an epistocracy' (Weymark 2015, 508).

Landemore considers both the CJT and the 'miracle of aggregation' as accounts or mechanisms of collective intelligence drawing from statistics and probability theory. The DTA theorem, instead, would be a more 'cognitive account' as 'it opens the black box of voters' (Landemore 2012a, 268). However, this categorisation might be slightly confusing for two different reasons, as we will see.

First, although 'account' and 'mechanism' seem to be used indistinctively in her essay, Landemore initially states that '"mechanism' is a loose term by which we mean to refer to the concrete institutions that channel collective wisdom, such as expert committees, deliberative assemblies, deliberative communities like Wikipedia, majority rule, information markets, or the ranking algorithms of search engines such as Google' (Landemore 2012b, 12). However, the examples that Landemore conflates are distinct: expert committees, deliberative assemblies, or deliberative communities are institutions in the sense of groups of individuals following 'action-guiding rules' (Ober 2008a, 8), while majority rule, information/prediction markets, or ranking algorithms are formalised methods, processes, or techniques. The different versions of CJT and 'the miracle of aggregation', therefore, are formal arguments, methods, or techniques to aggregate individual preferences into a collective outcome, but not institutional mechanisms involving real

people and both formal and informal *action-guiding rules*. Likewise, the DTA theorem offers a mathematical argument for collective decision making (rather than a cognitive account) and Page himself, in his answer to Thompson's rebuttal, refuses the accusation of misusing mathematics by assuring that 'In my [*Difference*] book, I caution readers to apply mathematical models carefully, highlighting the subtleties of moving from the starkness of mathematical logic to the richness of human interactions' (Page 2015, 10). Very much like mini-publics are regarded as living laboratories to test the theoretical principles of deliberative democracy, epistemic democrats ask for more 'empirical testing [of] the conditions under which groups of ordinary citizens are most likely to produce wise decisions' (Schwartzberg 2015, 197). Yet, none of the two approaches seem to fully acknowledge Page's call to take subtleties into account. In our view, those sub-tleties translate into the contextual, intermediate level that shapes human decisions and delimits their implementation, that is, the institutional layer of democratic systems. Human interactions within *ad hoc* mini-publics cannot be disconnected from the institutions that create them, set their governing rules, and apply (or not) their carefully deliberated outcomes. Since micro-deliberations do not happen in a vacuum, institutional agendas, policies, goals, expectations, and values are part of the analysis too. The systemic approach calls for an ethnography of the institutions as much as for empirical white-room testing or simulation modelling.

Let us illustrate this point with a real story about randomness and quizzes extracted from Leonard Mlodinow's book *The drunkard's walk: How randomness rules our lives* (Mlodinow 2009). The main character in this story is Marilyn vos Savant, an American columnist and author listed in the Guinness Hall of Fame for having scored the 'World's Highest IQ' when tested as a child. Marilyn vos Savant has also successfully run the *Parade* magazine column 'Ask Marilyn' since 1986, replying to questions posted by readers on a vast number of topics. On September 1990, a reader (inspired by a popular television game show called *Let's Make a Deal*) asked Marilyn:

> Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say #1, and the host, who knows what's behind the doors, opens another door, say #3, which has a goat. He says to you, "Do you want to pick door #2?" Is it to your advantage to switch your choice of doors?[6]

When Marilyn replied 'Yes; you should switch. The first door has a 1/3 chance of winning, but the second door has a 2/3 chance' all hell broke loose. Marilyn reported to have received more than 10,000 letters, some 1000 of them from angered PhDs and academics accusing her of 'propagating mathematical illiteracy', inviting her to check 'a standard textbook on probability' or arguing their case with the more succinct '*You are the goat!*' (Crockett 2015). According to Mlodinov, 92% of Americans 'agreed that Marilyn was wrong' (Mlodinov 2009, 44). Yet, she was right, and her response was not only supported by mathematical proof and computer simulations, but with data from the game show: 'those who found

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[6]As quoted in http://marilynvossavant.com/game-show-problem/.

themselves in the situation described in the problem and switched their choice won about twice as often as those who did not' (Mlodinov 2009, 55). The reason why Marilyn got it right and proved some of the best and brightest mathematical brains of our time—including Paul Erdős—wrong lies outside Page's 'starkness of mathematical logic'. Rather, it has to be found in the intermediate level of 'action-guiding rules'. The rules of the TV game show entitled the program host to intervene in an initially random process by using his inside knowledge to bias the result, thus violating randomness (idem). None of Marilyn's outraged critics did factor in the contextual rules that altered the abstract conditions of their models.

As Mlodinov puts it, 'to a mathematician a blunder is an issue of embarrassment, but to a gambler it is an issue of livelihood' (Mlodinov 2009, 56). As citizens (and voters) living in polities, we probably keep being a perpetual source of embarrassment to our political philosophers, although we're not in permanent gambling survival mode either. Most of the time, we play predictably by interacting with shared action-guiding rules. In other words, when it comes to real scenarios, either deliberative or not, there is no mathematical logic capable to fully contain the dynamic interplay between people's behaviours and rules and the emergent pragmatic properties of such an interplay. If that is the case, we still need an institutional theory of democracy to explain how collective intelligence emerges from a myriad of micro-interactions and contributes to produce an epistemically advanced form of government.

Second, what does 'collective intelligence' (CI) mean in the epistemic approaches we have reviewed so far? The notion of 'collective intelligence' gained its current popularity with the publication of Pierre Lévy's book *L'intelligence collective* (1997) who defined CI as a 'universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills' (Levy 1997, 13). Lévy's premise is that 'no one knows everything, everyone knows something, all knowledge resides in humanity' (Levy 1997, 13–14). This premise resonates with Edward Hutchins' work on socially distributed cognition (Hutchins 1995) and his effort to resituate the focus of cognitive science as a study of 'the social and material organization of cognitive activity' rather than the solitary individual. Other frequently quoted definitions approach CI as 'the capability for a group of individuals to envision a future and reach it in a complex context' (Noubel 2008, 233); 'groups of individuals doing things collectively that seem intelligent' (Malone 2008); or 'the general ability of a group to perform a wide variety of tasks' (Woolley et al. 2010). In a review discussing the recent literature on CI in humans, Juho Salminen highlights the multidisciplinary character of this emergent paradigm and identifies three levels of abstraction: the micro-level (CI as 'a combination of psychological, cognitive and behavioral elements'); the macro-level (CI as a 'statistical phenomenon') and the level of emergence between the two which 'deals with the question of how system behavior on the macro-level emerges from interactions of individuals at the micro-level' (Salminen 2012, 3–5). If we follow this categorisation, most of the epistemic approaches to democracy that draw on the notion of CI use it in the sense of a macro-level 'statistical phenomenon'. Yet, as we have argued, this may exclude the middle level that emerges from individuals

interacting with other individuals and rules: institutions. By considering institutions as a key instance of CI, we also expand our notion of 'epistemic' when referring to democratic systems. Thus, by 'epistemic' we do not refer to the properties of aggregation, the majority rule, or to truth-seeking or better-than-something-else mechanisms of CI. Rather, we understand 'epistemic' in the broader sense of knowledge that is openly shared, used, and remixed. In this regard, we heavily rely on the works of Josiah Ober when he explores the connections between democracy and knowledge using classical Athens as a case in point. And we also borrow from Henry Farrell and Cosma Shalizi's outline of what they defined as 'cognitive democracy' (Farrell and Shalizi 2015). We discuss both approaches in the next section.

2.4   Knowledge, Cognition, and Democracy

Josiah Ober's approach to the relationship between democracy and knowledge can be better illustrated by his proposal to revisit its original meaning (Ober 2008b). Ober considers that it is 'reductive' to define democracy as 'the power of the people (…) to decide matters by majority rule' since it makes democracy 'vulnerable to well-known social choice dilemmas, including Downs' rational ignorance and Arrow's impossibility theorem' (Ober 2008b, 3). He then proposes revisiting the concept by returning to the Greek sources of the term and rendering it 'less vulnerable to the problems associated with aggregating diverse preferences by voting' (Ober 2008b, 3). As opposed to other political terms, Ober notes, 'the term demos refers to a collective body' rather than a number (one, a few, or many) (2008b, 4) and "*kratos*', when it is used as a regime-type suffix, becomes power in the sense of strength, enablement, or 'capacity to do things'" (Ober 2008b, 6). *Demokratia*, therefore 'refers to a demos' collective capacity to do things in the public realm, to make things happen' (Ober 2008b, 7). To make things happen in the public realm, Ober argues, 'democratic Athens depended directly and self-consciously on actively deploying the epistemic resources of its citizenry' (Ober 2012, 118), something quite different from our current political practice that 'often treats free citizens as passive subjects by discounting the value of what they know' (Ober 2008a, 1).

Consequently, a definition of democracy as people's 'capacity to do things', not majority rule, raises the major question of how people can mobilise knowledge to do things, or 'how we put knowledge to work' (Ober 2008a, 3). Ober uses the word 'knowledge' rather than 'intelligence' since, drawing from organisational theory, his notion of knowledge covers 'a matrix of experience, expertise, and information' that is possessed by individuals but which is also 'located in social networks and reproduced by institutional processes' (Ober 2012, 119). The advantage of classical Athens, in Ober's view, was to put knowledge in action 'by transforming raw data and unprocessed information into politically valuable knowledge'—which is aligned with the definition of knowledge in Chap. 1 as 'information used to make a better decision'. Politically relevant knowledge consists of 'people's beliefs,

capabilities, experience, and information, organized in ways that can be reproduced and shared within and among collectivities'; and it 'conjoins social/interpersonal and technical/expert forms of knowledge that are possessed by the organisation as a whole (in the form of institutionalized processes and formal codes) and by individuals (both explicit and latently)' (Ober 2008a, 91).

As Ober notes, the Athenian processes are 'quite different from core political processes of modern democratic nation-states' (Ober 2008a, 97). Representative democracy or political parties were not part of the Athenian landscape, and voting for candidates seeking public office did not have the weight it has in our democratic systems. Yet, Ober identifies three problems in the organisation of politically valuable knowledge that are very familiar to any contemporary reader: (i) dispersed latent knowledge problem; (ii) unaligned actions problem, (iii) transaction costs problem. The solution to these three problems relies on institutional designs capable to articulate three different institutionalised epistemic processes: aggregation, alignment, and codification (Ober 2008a, 18). The three of them involve both innovation ('generation of new solutions') and learning ('socialisation in routines of proven value') (Ober 2008a, 19) and are defined as follows:

– Aggregation: the process of collecting the right kinds of dispersed knowledge in a timely manner for purposes of decision making.
– Alignment: [the process of] enabling people who prefer similar outcomes to coordinate their actions by reference to shared values and a shared body of common knowledge.
– Codification: the process by which implemented decisions become action-guiding rules capable of influencing future social behavior and inter-personal exchanges. (Ober 2008a, 26–27).

Ober presents knowledge aggregation in a large participatory democracy as a collective action problem where, for any rational individual, the costs of sharing knowledge exceed the potential benefits. To reverse that situation, some conditions must be met. The first one is more of a precondition: access to low-cost communication technologies that keep the burden to share information to a minimum. Second, either material or immaterial incentives (or a combination of both) to share knowledge must be in place. Third, successful aggregation requires an 'epistemic sorting device', that is, filtering mechanisms that are 'context sensitive' and retain valuable knowledge while leaving irrelevant or useless knowledge out (Ober 2008a, 120). As the costs of aggregating knowledge increase with complexity and scale, both coupled and fine-tuned processes of routinisation and innovation are required. Routinisation preserves the stock of knowledge by 'archiving data, establishing standard protocols, and socializing members into 'the way we do things around here'' (idem). As routinisation may also hinder adaptiveness to changing environments, institutions must be able to preserve diversity and the capacity to absorb external knowledge so that they can innovate and stay competitive.

Alignment in participatory democracy is about 'carrying out plans in the absence of command-and-control mechanisms' (Ober 2008a, 168). Ober argues that classical Athens used a combination of mechanisms allowing a seamless transition from decision-making to implementation of decisions: (i) informed leader following; (ii) procedural rules following, and (iii) institutional commitments following. Athenian citizens thus managed to align their behaviour by 'learning a substantial body of common knowledge, following informed leaders, mastering a set of simple procedural rules, and accepting the credibility of others' precommitments' (Ober 2008a, 171). Publicity was critical in the process, for it 'made relevant knowledge commonly available for uptake' (idem). But so was the legal system. By using a legal case study (a trial for treason in 330 B.C.) Ober highlights how the legal system 'played a key role in building useful social knowledge and publicizing commitments, but also in regulating the system by offering reasonable safeguards against socially disruptive cascades of accurate following' (Ober 2008a, 182).

Codification encapsulates the process of bringing social knowledge into statutory, written form. In Athens as in modern societies, Ober argues, codification can be approached as a mechanism to reduce transaction costs in productive exchanges or, following the work of Ronald Coase, making them 'as frictionless as possible' (Ober 2008a, 217). Nevertheless, as there are other complementary instruments which also serve that purpose, the epistemic process of codification is expanded to include not just formal rules, but also dispute resolution procedures, standard exchange media (coinage, measures, weights, etc.), open-access facilities (markets, communications, transports, etc.) and third-party rents (e.g. taxes). Codified democratic rules, therefore, aimed at providing predictability to market exchanges but, ultimately, embodied fairness (or the mutually shared guarantee that similar situations would be treated similarly). A codified principle of fairness helped to consolidate 'a mass/elite social equilibrium' and made Athenian democracy more resilient to 'endemic hostility among social classes'.

In describing the three epistemic processes of aggregation, alignment, and codification, Ober emphasises the role of distributed social and technical knowledge as the fertiliser to the 'flourishing of democratic organisations' (Ober 2008a, 265) or, as he will later conceptualise, as a key contributor to 'efflorescence', defined as 'increased economic growth accompanied by a sharp uptick in cultural achievement' (Ober 2015, 2). Democratic processes enabling widely distributed knowledge and the efficient interplay between economic growth and cultural achievement also made citizens willing to become 'sharers in a democratic culture' by 'rationally [choosing] to participate in the productive work of citizenship' (Ober 2008a, 267).

What are the implications of Ober's analysis of democracy in classical Athens? The first one is that a more active, engaged citizenship is possible.

> If management of knowledge, distributed among a diverse population through the operation of participatory institutions, helped to promote high performance in the competitive world of classical Greece, there is less reason to assume that the role of the citizen in a modern democracy need be limited to occasionally choosing among competitive elites on the basis of their party affiliation (Ober 2008a, 267–268).

In addition, the Athenian lessons also suggest that adequate mechanisms of coordination do not inevitably require command-and-control structures in place, as technocratic and elitist arguments would presuppose. Emergent models of commons-based production systems and peer-to-peer (P2P) structures of governance as the ones described, among others, by Benkler (2003, 2006), Bollier (2008, 2014) or Kostakis and Bauwens (2014) provide evidence of similar coordinating mechanisms in absence of centralised authorities. In many cases, low-cost communication technologies and information filtering systems do not just mitigate transaction costs, but actually enable transactions to happen. Likewise, they may help to reduce the increased scale issues that Ober points out. Interestingly, Ober's closing remarks acknowledge that 'the full potential of modern information technology for facilitating knowledge aggregation and public action in democratic contexts remains to be explored' (Ober 2008a, 268). In a similar vein, as Henry Farrell and Cosma Shalizi have suggested in their outline of 'cognitive democracy':

> The rise of the Internet makes this an especially good time for experimenting with democratic structures. Democracy is uniquely fitted to help people with highly diverse perspectives come together to solve problems collectively. Democracy can do this better than either markets or hierarchies because it brings these diverse understandings into direct contact with each other, allowing forms of learning that are unlikely either though the price mechanism of markets or the hierarchical arrangements of bureaucracy (Farrell and Shalizi 2015, 211).

Precisely, exploring the potential of some of our state-of-the-art information technologies for democracy is the core aim of this book. In our approach, we consider that linking digital data, information, and knowledge could be one of the mechanisms contributing to a renewed version of knowledge distribution in our contemporary societies. The following chapter will provide some examples and suggestions in this direction.

2.5   Conclusion

This chapter has outlined two mainstream approaches to democratic theory. Despite their differences, both deliberative and epistemic theories of democracy have more common roots and share more normative ideals than their readings might initially suggest. As Jose Luis Marti argues, a defender of deliberative democracy 'cannot actually hold a pure proceduralist conception' while at the same time an 'adequate epistemic conception of deliberative democracy' must combine intrinsic and instrumental principles (Marti 2006, 28). This confluence of procedural principles and deliberative outputs is also traceable in the experimental design of mini-publics or in the cases that Ober selects to illustrate the unfolding of the epistemic processes of aggregation, alignment, and codification in classical Athens.

The 'linked democracy' perspective proposed in this book does not contradict these previous approaches. Rather, it builds on them to develop the foundations for a theory of the meso level, or an institutional theory of democracy in the digital era.

In this attempt, it largely borrows from these two major contributions to propose, in line with Farrell and Shalizi, a 'broader agenda for cross-disciplinary research involving computational scientists and democratic theorists' (Farrell and Shalizi 2015, 212). These borrowings notwithstanding, our linked democracy approach analogy will require an institutional analysis of democracy (or a meso-level analysis): platforms, apps, blockchains, or digital data are just the technology component of an emergent participatory ecosystem. We need to better understand the properties that emerge through the interaction between people, digital tools and data in order to bridge the gap between technology and institutions, since only the latter, if consistently linked, can propagate the knowledge required to enhance civic action and, ultimately, bring *isegoria* (the equal say of every citizen) into the democratic system.

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