Let's Keep it Democratic

Ensuring that ICT-enabled policy co-creation stays legitimate

Erica Celine Yu

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Supervisor: Dr. Constanze Binder
Advisor: Dr. Stefan Wintein

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Erasmus Institute for Philosophy and Economics
Erasmus University Rotterdam

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1 Introduction

Information and communication technologies (ICT's) have enabled unprecedented amounts of citizen participation in policy making. E-democracy has been able to achieve significant improvements in citizens' access to and exchange of politically relevant information (Van Dijk 2012). Moreover, these vast amounts of information can be processed better and faster with increases in the powers and capabilities of digital technologies (Von Hippel 2016). In Mexico City, citizens were able to co-produce the first-ever public transportation map of over 1,500 bus routes through a mobile app within just two weeks (Téllez 2016). This was made possible by ICT's enabling fast and easy sharing of information from citizens to policy makers and processing of these great amounts of information.

However, there are also risks that come with this exponential increase in the levels of citizen participation made possible through ICT's. Severe and unintended consequences may result from certain value conflicts that may arise from the use of ICT's (Morozov 2013; Jasanoff 2016). An example of these are disagreements on the value of privacy and what the acceptable levels of intrusion that citizens are subjected to are. Digital technologies also impose some structures on how citizens are able to contribute to and participate in collective decision-making processes, which may limit the choices that they are able to make (Ashton, Weber, and Zook 2017; Kitchin 2019). ICT's may also amplify certain inequalities and injustices that already exist within society (O'Neil 2016).

The goal of this thesis is to investigate both the potential benefits and the potential risks of using ICT's to enable citizen participation in policy making. I focus particularly on the democratic participation of citizens in *policy co-creation processes*, which involve "the joint effort of citizens and public sector professionals in the initiation, planning, design, and implementation of public services" (Brandsen, Steen, and Verschuere 2018, 3). The kind of democratic participation that policy co-creation entails goes beyond periodic elections of government officials who are then tasked with the creation and implementation of policy. Rather, policy co-creation emphasizes active citizen participation in their self-governance by their also being part of the policy process themselves.

The effect of ICT's on these policy co-creation practices will then be evaluated based on the concept of *democratic legitimacy*, defined by Peter (2009, 1) as the "ideal for how members of a democratic constituency ought to make decisions about how to organize their life together." This is a normative concept: it establishes conditions that should be satisfied in order for a democratic decision—such as a co-created policy—to be acceptable or justifiable (Peter 2017).

Bringing this all together, the research question that I will address in this thesis is the following: How does the use of ICT's in *policy co-creation practices* affect their *democratic legitimacy*?

In this introductory chapter, I will first give a brief background on policy co-creation practices and the use of ICT's to enable these processes (Section 1.1). I will then state my research question and the contribution of the thesis to the theory and practice of policy co-creation (Section 1.2). Finally, I will sketch the outline of the following chapters of this thesis (Section 1.3).

1.1 Policy co-creation and the influence of ICT's

In this section, I will give a brief background on policy co-creation—the form of citizen participation in policy making which is the subject of this thesis—and detail how ICT's have influenced policy co-creation practices. As mentioned earlier, policy co-creation is defined as processes which involve "the joint effort of citizens and public sector professionals in the initiation, planning, design, and implementation of public services" (Brandsen, Steen, and Verschuere 2018, 3).

Policy co-creation takes as its ideal the participatory model of democracy—which emphasizes active citizen participation in their self-governance (Pateman 1970; Macpherson 1978; Held 2006, 215; Hilmer 2010). The principle of justification of participatory democracy is that it enables "a society which fosters a sense of political efficacy, nurtures a concern for collective problems and contributes to the formation of a knowledgeable citizenry capable of taking a sustained interest in the governing process" (Held 2006, 221). In the same vein, policy co-creation is justified insofar as it fosters political efficacy, nurtures a concern for collective problems, and contributes to the formation of a knowledgeable citizenry. In Chapter 2, I will formulate a conceptual framework that formalizes these conditions which make a co-created policy acceptable or justifiable.

Citizens can engage in policy co-creation at one or more of the following stages of the policy cycle: (i) problem identification, (ii) policy formulation, (iii) policy implementation, and (iv) policy evaluation (Linders 2012; Voorberg, Bekkers, and Tummers 2015; Nabatchi, Sancino, and Sicilia 2017; Veenstra and Kotterink 2017; Janssen and Helbig 2018).

In the (i) problem identification stage, the collective decision being made is "What problems should be addressed by policy?" An example of a co-creation practice at this stage would be a survey conducted to ask citizens what their biggest concerns for the community are, or a town hall meeting where citizens can discuss this with each other.

The (ii) policy formulation stage is then concerned with "What is the most effective policy in order to best address the problem(s) identified in the first stage?" This stage encompasses the design of the policy alternatives and the decision-making process to choose between these alternatives. An example of a co-creation practice at this stage would be participatory budgeting—governments sourcing ideas for publicly funded projects from citizens, and eventually having them vote for the projects that they would like funded.

The (iii) policy implementation stage involves answering the question of "How should the policy be monitored and enforced in order to ensure that its goals are achieved?" An example of a co-creation practice at this stage would be communities organizing

neighborhood watches to assist police in preventing crime.

Finally, (iv) policy evaluation seeks to address "To what extent was the implemented policy a success or a failure?" An example of a co-creation practice at this stage would be similar to those of the problem identification: surveys where citizens evaluate the implemented policy, and community meetings to openly discuss their ideas about it.

The stage of the policy process in which co-creation takes place has implications for the framework of democratic legitimacy used to evaluate these practices. This will be further discussed in Chapter 2.

Policy co-creation practices have been influenced by ICT's by not only making existing practices much easier to implement and scale, but also by creating entirely new practices (Lember 2018). These are the two levels of influence that ICT's have on traditional (i.e., non-ICT) policy co-creation practices: (1) the addition of a digital layer on policy co-creation practices, and (2) the creation of entirely new practices of policy co-creation.

The first and most basic level of influence is the addition of a digital layer on top of traditional policy co-creation practices. Examples of these would be e-voting, e-surveys, e-deliberation, and digital platforms, which add a digital layer on the traditional policy co-creation practices of referenda, in-person surveys, town hall meetings and consultations, and in-person coordination with public sector professionals. These technologies have changed traditional practices of co-creation in terms of (i) how citizens are able to access the policy co-creation process, (ii) the level of anonymity that citizens have in the policy co-creation process, and (iii) how citizens interact in the virtual environment in which policy co-creation takes place. In Chapter 3, for each of these three channels, I will discuss the potential benefits and risks that the addition of a digital layer brings to the democratic legitimacy of policy co-creation practices.

The second level of influence would be the creation of entirely new practices of policy co-creation. These include crowdsourcing—the process of openly soliciting information and ideas from citizens, simulations and gamifications—giving citizens interactive and immersive experiences and recording their responses and behavior, and big data collection from devices with sensors such as smart appliances and smart devices. These are practices of policy co-creation that did not have a direct traditional equivalent, and are only made possible with the use of ICT's. For instance, big data collection is made possible only with the sensor technology embedded into hardware devices and internet connectivity. What is unique about these new practices of policy co-creation enabled by the use of ICT's is that they are able to collect information from citizens in indirect and passive ways. Indirect input is collected when citizens are asked for their responses to a certain question, which will then be used to *infer* their answers to a completely different question. An example of this would be when a participant's decisions in a simulated game are used to infer which problems she thinks should be addressed in her community through policy. Passive input is collected when citizens do not have to perform a conscious and willed action to provide input into the decision-making process. An example of this would be the collection of real-time data from smart watches to analyze whether a given health policy intervention is effective. In Chapter 4, I examine the potential benefits and risks that the collection of indirect and passive inputs have on the democratic legitimacy of policy co-creation practices.

1.2 Research question and significance

The research question that I will address in this thesis is the following: How does the use of ICT's in policy co-creation practices affect their democratic legitimacy? More specifically, I will do the following:

1. Formulate a conceptual framework to evaluate the democratic legitimacy of policy co-creation practices,
2. Apply the framework to identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices, and
3. Come up with general design guidelines for ICT-enabled policy co-creation practices which aim to maximize the identified potential benefits and minimize the identified potential risks.

One contribution of this thesis is to provide a conceptual foundation for evaluating ICT-enabled policy co-creation practices based on the political philosophy literature on democratic legitimacy. Analyses of policy co-creation practices have tended to use ad hoc criteria for their evaluations without providing a well-defined conceptual framework underlying these criteria. For example, Lember (2018) investigates the effects of ICT's on policy co-creation in terms of empowerment, participation and inclusiveness, and efficiency and effectiveness—without providing an underlying framework to support the use of these three particular criteria. I will formulate a conceptual framework by first identifying the conceptions of democratic legitimacy from the taxonomy provided by Peter (2007, 2009, 2017) which are appropriate to use for evaluating policy co-creation practices, and then formalizing these conceptions into a set of criteria with which to assess these practices.

Another contribution of this thesis is the formulation of general design proposals for ICT-enabled policy co-creation practices, which can then be further refined by specifying design hypotheses to be tested empirically. For instance, one general design guideline for ICT-enabled policy co-creation that I will formulate in Chapter 3 is to "Use asynchronous and synchronous communication technologies together to encourage both careful construction of ideas and responses, and lively and engaging debate." This can be further refined into a design hypothesis by (i) specifying a policy co-creation practice where it can be applied, (ii) specifying the asynchronous and synchronous communication technologies to be used, and (iii) specifying how much of the communication should make use of asynchronous and synchronous methods. An example of such a design hypothesis would be: Conducting 50% of communication in an online citizen's dialogue for policy evaluation through video chat (synchronous) and 50% through a message board (asynchronous) would lead to more carefully constructed ideas and responses and more lively and engaging debate than when communication is conducted either exclusively through video chat or exclusively through message boards. Different combinations of synchronous and asynchronous communication (e.g., 80% video chat and 20% message board or 20% video chat and 80% message board) can also be tested against each other

to determine what the ideal combination of these communication modes should be for that specific policy co-creation practice. The results of this empirical testing can then contribute to better-designed policy co-creation practices in terms of their democratic legitimacy.

1.3 Structure of the thesis

The thesis is structured as follows:

In Chapter 2, I come up with a framework to evaluate the democratic legitimacy of policy co-creation practices. First, I assess the different conceptions of democratic legitimacy based on the taxonomy by Peter (2007, 2009, 2017) to determine which are the appropriate ones for evaluating policy co-creation practices. I then formalize these appropriate conceptions of democratic legitimacy into a set of criteria for evaluating policy co-creation practices.

Using the framework established in Chapter 2, I then identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices, and formulate general design guidelines for ICT-enabled policy co-creation practices to maximize these potential benefits and minimize these potential risks in Chapters 3 and 4.

In Chapter 3, I focus on the first and most basic level of influence that ICT's have on policy co-creation practices: the addition of a digital layer. In particular, I focus on three types of technologies: e-consultations, e-voting and e-surveys, and platforms. These technologies have changed traditional practices of co-creation in terms of (1) how citizens are able to access the decision-making process, (2) the level of anonymity that citizens have in the decision-making process, and (3) how citizens interact in the virtual environment. For each of these three channels of influence, I will identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices, and formulate general design guidelines for ICT-enabled policy co-creation practices to maximize these potential benefits and minimize these potential risks.

In Chapter 4, I focus on the second level of influence of ICT's on policy co-creation: the creation of entirely new practices of policy co-creation. These new practices include crowdsourcing, simulations and gamifications, and big data collection. These new practices have enabled citizens to give indirect and passive input into the decision-making process. Indirect input is collected when citizens are asked for their responses to a certain question, which will then be used to *infer* their answers to a completely different question. Passive input is collected when citizens do not have to perform a conscious and willed action to provide input into the decision-making process. I will identify the potential benefits and risks of the indirect and passive collection of citizens' inputs to the democratic legitimacy of policy co-creation practices, and formulate general design guidelines for these ICT-enabled policy co-creation practices to maximize these potential benefits and minimize these potential risks.

In Chapter 5, I will conclude this thesis with a summary of (1) the framework of democratic legitimacy for evaluating policy co-creation practices, (2) the evaluation of the potential benefits and risks of ICT's on the democratic legitimacy of policy co-

creation practices, and (3) the general design guidelines which aim to maximize the identified benefits and minimize the identified risks. I will also address possible objections to my arguments and analyses.

2 Democratic legitimacy and policy co-creation: The framework

2.1 Introduction: Conceptions of democratic legitimacy

Peter (2009, 1) defines democratic legitimacy as the "ideal for how members of a democratic constituency ought to make decisions about how to organize their life together." This is a normative concept: it establishes conditions that should be satisfied in order for a democratic decision to be acceptable or justifiable (Peter 2017). Different conceptions of democratic legitimacy put forward different sets of such conditions. This chapter will assess these different conceptions of democratic legitimacy—and the conditions they impose on decision-making processes—to determine which are appropriate to evaluate policy co-creation practices. As I briefly discussed in Chapter 1, the processes of democratic decision-making that policy co-creation entail go beyond periodic elections of government officials, but involve active citizen participation in their self-governance. Thus, these appropriate conceptions of democratic legitimacy apply specifically to these participatory methods of democratic decision-making. I will then formalize these conceptions of democratic legitimacy by specifying a set of criteria for evaluating policy co-creation practices.

Peter creates a two-dimensional taxonomy of these different conceptions of democratic legitimacy (Peter 2007, 2009, 2017). The first dimension distinguishes between different categories of requirements imposed on the democratic process (Peter 2007, 332; 2017). Different theories of democracy propose different normative weights placed on *procedures* relative to the *outcomes* of decision-making processes.

On the one end of the spectrum, there are purely procedural conceptions of democratic legitimacy (Peter 2007, 332; 2017). The democratic legitimacy of a decision-making process according to this account is based solely on in how far the procedure itself promotes certain democratic values. An example of this would be evaluating a democratic decision-making process based on how much the process itself is able to promote the value of procedural equality (e.g., Christiano 2008, 294).

On the other end of the spectrum, there are purely instrumental conceptions of democratic legitimacy (Peter 2007, 332; 2017). These accounts base democratic legitimacy solely on the quality of the outcomes of the decision-making processes. An example of this would be evaluating a democratic decision-making process based on how close the resulting distribution of wealth gets to a perfect egalitarian distribution: the closer to perfectly egalitarian the resulting distribution, the greater the legitimacy of the decision-making process.(e.g., Arneson 2003; Wall 2007).

Between the two extremes of pure procedural and pure instrumental accounts, there

are also mixed conceptions of democratic legitimacy (Peter 2017). These take into account both (i) in how far the procedure itself promotes certain democratic values and (ii) the quality of the outcomes that result (e.g., Cohen 1997a; Knight and Johnson 1994; Cohen 1997b; Estlund 2009). An example of this would be a combination of the two previous examples: a decision-making process that is evaluated based on in how far the procedure itself promotes procedural equality, and how closely the resulting distribution of wealth gets to a perfect egalitarian distribution.

The second dimension distinguishes between alternative ways of conceiving of democratic decision-making (Peter 2007, 331; 2009). Peter makes two distinctions here: between aggregative and deliberative models of democracy, and between epistemic and non-epistemic models of democracy.

The aggregative model of democracy conceives of democratic decision-making as the process of taking individual preferences or beliefs as an input and generating a collective choice as an output (Peter 2007, 331). Examples of these would be voting (e.g. Condorcet and Caritat 1995), ranking (e.g. Arrow 1951), and scoring (e.g. Borda 1781) procedures. The deliberative model of democracy conceives of decision-making as a process of public discussion (Peter 2007, 331). Mini-publics, where a representative sample of citizens is gathered to reason together about an issue of public concern, is an example of a decision-making process under the deliberative model of democracy (Dahl 1989; Grönlund, Bächtige, and Setälä 2014).

The epistemic model of democracy conceives of decision-making as a process of social learning (Peter 2007, 331). Under this model of democracy, collective decision-making processes are evaluated based on their ability to gather information that is highly dispersed across society and to generate knowledge based on this information (Anderson 2006, 8).[1] An example of an epistemic model of democracy would be the Diversity Trumps Ability (DTA) account, which shows that "diverse collections of nonexperts do a better job than experts in solving many problems" (12). Non-epistemic models of democracy, on the other hand, would not take these social learning considerations into account. A voting procedure which simply aims to aggregate individual preferences into a social choice—without concern for what can be learned from these individual preferences—is an example of such a process.

Summing up the discussion so far, there are three relevant distinctions between the different conceptions of democratic legitimacy that Peter proposes: (i) between pure procedural, pure instrumental, and mixed conceptions, (ii) between aggregative and deliberative models of democracy, and (iii) between epistemic and non-epistemic models of democracy.

Along the second distinction—(ii) between aggregative and deliberative models of democracy—selecting the appropriate conception of democratic legitimacy to use for evaluating policy co-creation is simple. For policy co-creation practices which take individual preferences or beliefs as an input and generate a collective choice as an output, the aggregative model of democracy will be used. An example of such a policy co-creation

1. This is compatible with both the aggregative and deliberative models of democracy (Peter 2007, 331).

practice where the aggregative model should be used is participatory budgeting, where citizens get to vote on specific projects to be funded by the government. For policy co-creation practices which entail process of public discussion, the deliberative model will be used. Examples of such a policy co-creation practices where the deliberative model should be used are citizen consultations or dialogues.

The rest of this chapter will be concerned with the two other distinctions—(i) between pure procedural, pure instrumental and mixed conceptions; and (iii) between epistemic and non-epistemic models of democracy—in order to determine which conceptions of democratic legitimacy are appropriate to use for evaluating policy co-creation practices. The table below summarizes the taxonomy of the different conceptions of democratic legitimacy based on these two distinctions.

	Pure procedural	Mixed	Pure instrumental
Epistemic	Pure procedural epistemic	Mixed epistemic	Pure instrumental epistemic
Non-epistemic	Pure procedural non-epistemic	Mixed non-epistemic	Pure instrumental non-epistemic

Table 2.1: Conceptions of democratic legitimacy
Adapted from Peter (2007, Table 1)

In deciding whether pure procedural, pure instrumental, or mixed conceptions of democratic legitimacy are appropriate for evaluating policy co-creation practices, the issue being addressed is how much normative weight should be placed on the policy co-creation *procedure* relative to the *outcome* of the policy co-creation process. In other words, should the democratic legitimacy of a policy co-creation practice such as participatory budgeting be based solely on in how far the procedure itself (e.g., anonymous vs. public voting) promotes certain democratic values, solely on the quality of the outcome (in the case of participatory budgeting, the project chosen by the citizens), or on both?

In deciding whether epistemic or non-epistemic models of democracy should be used in evaluating policy co-creation practices, the issue being addressed is whether policy co-creation should be evaluated based on its ability to gather information that is highly dispersed across society and to generate knowledge based on this information. In other words, should the democratic legitimacy of policy co-creation practice such as citizen dialogues be based on in how far policy co-creation practices are able to generate knowledge based on information gathered from citizens?

The chapter will proceed as follows:

In Section 2.2, I will argue that only either the purely procedural or the mixed conceptions should be used to evaluate policy co-creation practices, as purely instrumental conceptions fail to defend or justify why a policy that is co-created with citizens is better than one made by public sector professionals without any citizen consultation, if both give rise to the same outcomes. Even more worryingly, purely instrumental accounts of democratic legitimacy could justify violations of values that are intrinsic to democracy: freedom as self-determination and equality of advancement of interests.

In Section 2.3, I will argue that the epistemic model of democracy should be used, as the goal of policy co-creation is to generate knowledge about (i) which problems should be addressed through policy, (ii) how to most effectively address those problems through policy, (iii) how to most effectively implement policy, and (iv) whether a policy is a success or a failure through gathering information from different parts of society. Epistemic conceptions are appropriate for evaluating policy co-creation practices as they are able to take into account how much knowledge is generated from the information that is gathered from citizens.

From the discussions in Sections 2.2 and 2.3, the appropriate conceptions of democratic legitimacy to use for evaluating policy co-creation practices are: pure procedural and mixed (along the first dimension), and epistemic (along the second dimension). Combining the two dimensions of the taxonomy, the conceptions that I have argued are appropriate for evaluating policy co-creation practices are the pure procedural epistemic and the mixed epistemic conceptions. The pure procedural epistemic conception takes into account (i) in how far policy co-creation practices promote values that are intrinsic to democracy and (ii) in how far it is able to generate knowledge based on the information gathered from citizens. The mixed epistemic conception also takes (i) and (ii) into account, and in addition, also takes (iii) the quality of the outcomes of the policy co-creation process into account in evaluating its democratic legitimacy.

In Section 2.4, I will delineate when the pure procedural epistemic conception should be used, and when the mixed epistemic conception should be used. When there is a legitimate epistemic authority on the issue being decided on, then that authority can set a justifiable standard with which to measure the quality of the outcome of the decision-making process. The mixed epistemic conception—which takes the quality of the outcomes into account, in addition to the quality of the procedure—should be used in these cases. When such a legitimate epistemic authority does not exist on the issue being decided on, then there is no justifiable standard with which to measure the quality of the outcome of the decision-making process. The pure procedural epistemic conception—which does not take the quality of the outcomes into account—should be used in these cases.

With this, I will argue that the pure procedural epistemic conception should be used in the problem identification stage of the policy process as there is no legitimate epistemic authority on which problems should be addressed through policy. Further, I will argue that the mixed epistemic conception should be used in the policy formulation, policy implementation, and policy evaluation stages of the policy process, as there exist legitimate epistemic authorities on how a policy should be designed to effectively address certain problems, how a policy should be effectively implemented, and whether a policy should be regarded as a success or a failure.

In Section 2.5, I will then formalize the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy into a set of criteria for evaluating policy co-creation practices at every stage.

2.2 Towards procedural and mixed conceptions of legitimacy

In this section, I will tackle the first distinction between the different conceptions of democratic legitimacy: between pure procedural, pure instrumental, and mixed accounts. I will argue that the pure procedural and mixed conceptions of democratic legitimacy are the appropriate ones to use for evaluating policy co-creation practices. In order to argue for these conceptions, I will show how purely instrumental conceptions are at best, insufficient, and at worst, problematic to use for evaluating policy co-creation practices.

Purely instrumental conceptions of democratic legitimacy fail to defend or justify democracy as a better political system than other systems which may be equally effective in bringing about good outcomes, such as autocratic regimes (Buck 2012, 231). More specifically, with the case of policy co-creation, a purely instrumental conception of democratic legitimacy is only concerned with the quality of the *policy*, and leaves out the essential component of the quality of the *co-creation* that takes place.

To illustrate this argument against purely instrumental conceptions of democratic legitimacy, the benevolent dictator example due to Mill (2010, 399) is helpful to use:

> The supposition is, that absolute power, in the hands of an eminent individual, would insure a virtuous and intelligent performance of all the duties of government. Good laws would be established and enforced, bad laws would be reformed; the best men would be placed in all situations of trust; justice would be as well administered, the public burden would be as light and as judiciously imposed, every branch of administration would be as purely and as intelligently conducted as the circumstances of the country and its degree of intellectual and moral cultivation would admit.

If a democratic system gives rise to these same impressive societal outcomes, a purely instrumental conception of democratic legitimacy does not provide a justification for the democratic system rather than the benevolent dictatorship. In the case of evaluating policy co-creation practices, a purely instrumental conception of democratic legitimacy is unable to justify why a policy that is co-created with citizens might be better than one that is made solely by public sector professionals (without citizen consultation), if both give rise to the same outcome (e.g., the same amount of wealth generated).

A more problematic concern would be cases wherein the democratic system gives rise to slightly worse outcomes than the benevolent dictatorship. Say, for instance, all other things held equal, that the democratic system has a gross domestic product (GDP) per capita of $29,999 and the benevolent dictatorship a GDP per capita of $30,000. A purely instrumental conception which uses the GDP per capita as its standard for good outcomes would deem the benevolent dictatorship to be a more legitimate political system than the democratic one. The same conclusion would be drawn for a policy which is co-created with citizens giving rise to a lower GDP per capita than another which involved no citizen consultation whatsoever. In line with this, Buck (2012, 233) points out that purely instrumental accounts of democratic legitimacy "are inconsistent

with the aim and function of democracy and, as a result, allow for the violation or, at the very least, erosion, of moral commitments that are *constitutive* of democracy" (emphasis added).

In particular, Buck (2012, 236) argues that purely instrumental conceptions are inconsistent with the intrinsic democratic value of freedom as self-determination. Freedom is argued to be an intrinsic value of democracy in the following way (Christiano 2018): Each individual has a right to freedom: she ought to be the master of her life, which is shaped by the larger political, economic, and social environment in which she lives. Having liberty would thus mean having control over this larger environment. Democracy gives each citizen this control by giving her a voice in collective decision-making processes that determine what this environment will look like (Gould 1990, 45ff.).

Under a purely instrumental conception of democratic legitimacy, however, a person's power to contribute to the democratic process can be justifiably diminished for the sake of enhancing the quality of the decisions made (Christiano 2018). As Mill (2010, 400) notes in his case of the benevolent dictatorship:

> The nation as a whole, and every individual composing it, are without any potential voice in their own destiny. They exercise no will in respect to their collective interests. All is decided for them by a will not their own, which it is legally a crime for them to disobey.

Despite the good outcomes that result from the benevolent dictator's rule, this is a direct violation of democracy's commitment to freedom as self-determination. The same would be true of a policy that was created by public sector professionals without any consultation of the citizens who would be affected, even if it gave rise to good outcomes.

Buck (2012, 236) also argues that purely instrumental conceptions of democratic legitimacy would also be inconsistent with the intrinsic democratic value of equality in the advancement of interests. Equality is argued to be an intrinsic value of democracy in the following way (Christiano 2018): Society should be structured in such a way that all individuals' interests have an equal chance to be advanced in decisions that determine the political, economic, and social environment that they live under. These interests are diverse because of differences in natural talents, upbringing, and other social and environmental factors. Moreover, people have deep cognitive biases towards their own interests—making it likely that they misrepresent or fail to acknowledge others' interests. Thus, for each individual's interests to have a chance to be equally advanced in decisions about how to organize societal life, each should be given equal say (Christiano 2004). Democracy gives each individual this equal say in collective decision-making processes.

However, a purely instrumental account of democratic legitimacy would justify the unilateral setting of a standard for the quality of outcomes by the benevolent dictator without the consultation of the citizens under her rule (Buck 2012, 233). An example of this would be the benevolent dictator aiming for maximum economic growth without regard for negative environmental consequences which disproportionately affect indigenous groups. In a plural society with widespread disagreement over what these standards for the quality of outcomes should be, this goes directly against the commitment

of democracy to political equality in the advancement of interests. The same holds for policy co-creation practices which systematically exclude certain people or groups from advancing their interests in the process, even if the policy gives rise to good outcomes.

As I have shown, purely instrumental accounts of democratic legitimacy would justify policy co-creation practices which undermine the intrinsic democratic values of freedom as self-determination and equality of advancement of interests. However, in order for policy co-creation to be *democratically* legitimate, these two values have to be promoted by the decision-making *procedure*. Thus, purely instrumental accounts are not appropriate for evaluating the democratic legitimacy of policy co-creation practices.

The pure procedural and mixed accounts—which take into account in how far the decision-making procedure itself promotes certain values intrinsic to democracy—are able to take freedom as self-determination and equality of advancement of interests into account when evaluating policy co-creation practices. In other words, these accounts would be able to justify why a policy that is co-created with citizens might be better than one that is made solely by public sector professionals (without citizen consultation), even if both give rise to the same outcome (or even if the co-created policy gives rise to a slightly worse outcome). The pure procedural and mixed accounts are able to say why a policy co-creation practice is *democratically* legitimate. Thus, pure procedural and mixed accounts are the appropriate ones to use for evaluating the democratic legitimacy of policy co-creation practices.

2.3 Towards an epistemic model of democracy

In the previous section, I tackled the first distinction between the different conceptions of democratic legitimacy—between pure procedural, pure instrumental, and mixed accounts—and argued that the pure procedural and mixed accounts were appropriate to use for evaluating policy co-creation practices. In this section, I will discuss the second distinction between different conceptions of democratic legitimacy—between epistemic and non-epistemic accounts—and argue that the epistemic accounts are appropriate to use for evaluating policy co-creation practices.

The problems that public policies seek to address demand the use of information that is highly dispersed across society (Hayek 1945; Longino 1990; Harding 1991; Anderson 2006, 8).This socially dispersed information is transmitted in two forms which democratic states can respond to: talk and votes (Anderson 2006, 8–9). Talk is transmitted through deliberative decision-making processes, and votes are transmitted through aggregative decision-making processes. Policy co-creation aims to gather this information and to use these in order to generate knowledge to create, implement, and evaluate policies in the most effective way (Brandsen, Steen, and Verschuere 2018).

A non-epistemic account of democratic legitimacy does not consider the knowledge-producing value of policy co-creation in its evaluations (Peter 2007, 331). Take, for example, two policy co-creation practices in the policy formulation stage which both give all citizens the effective opportunity to participate (i.e., political freedom), and give each of these citizens an equal say in the process (i.e., political equality). The

difference between the two is that in one of these co-creation practices, citizens are only given the opportunity to provide rankings of the different options; while in the other co-creation practice, citizens are allowed to give more detailed responses where they can provide reasons and arguments for their rankings. A non-epistemic account of democratic legitimacy would regard these two policy co-creation practices as equally good because it provides the same amount of political freedom and political equality to citizens. This account fails to take account of a key difference between the two co-creation practices: more knowledge is acquired from the second practice, as citizens are able to more freely express their beliefs and preferences and their reasons for them. This knowledge can be used in policy formulation, and should thus not be ignored in evaluations of the democratic legitimacy of policy co-creation practices.

An epistemic account of democratic legitimacy, on the other hand, is able to take account of the difference between the two co-creation practices in terms of how much knowledge is acquired from them (Anderson 2006, 8). Under the epistemic account, the second co-creation practice from the previous example is more democratically legitimate than the first because more knowledge is acquired in the second than in the first. This knowledge can then be used in policy formulation. Using the same example, in the second co-creation practice, the reasons and arguments given for and against the different options can be used to formulate a policy that combines the best aspects identified in the different options while minimizing the bad aspects identified. Thus, the epistemic account of democratic legitimacy is the appropriate one to use for evaluating policy co-creation practices.

2.4 Pure procedural epistemic or mixed epistemic?

So far, the conceptions of democratic legitimacy that I have argued are appropriate for evaluating policy co-creation practices are the pure procedural and mixed accounts (along the first dimension of the taxonomy) and the epistemic accounts (along the second dimension of the taxonomy). As argued in Section 2.2, the pure procedural and mixed accounts—which base the democratic legitimacy of decision-making processes on in how far the procedure itself promotes certain values intrinsic to democracy—are able to take the democratic values of freedom as self-determination and equality of advancement of interests into account when evaluating policy co-creation practices. As argued in Section 2.3, the epistemic account of democratic legitimacy is able to take the value of the knowledge generated from gathering socially dispersed information into account when evaluating policy co-creation practices.

Combining these two dimensions, the two conceptions of democratic legitimacy that I have argued are appropriate for evaluating policy co-creation practices are the pure procedural epistemic and the mixed epistemic conceptions (see Table 2.2).

Both the pure procedural epistemic and mixed epistemic conceptions take into account in how far the decision-making *procedure* itself promotes certain values intrinsic to democracy, and in how far it is able to generate knowledge based on the information gathered. The difference between the two conceptions is that the mixed epistemic ac-

	Pure procedural	Mixed
Epistemic	**Pure procedural epistemic**	**Mixed epistemic**

Table 2.2: Appropriate conceptions of democratic legitimacy for evaluating policy co-creation practices

count also takes into account the quality of the *outcomes* of the decision-making process, while the pure procedural epistemic account does not. In this section, I will delineate when the pure procedural epistemic conception should be used, and when the mixed epistemic conception should be used in evaluating policy co-creation practices.

Peter (2016) argues that the question of whether a pure procedural epistemic or mixed epistemic conception is appropriate to use depends on whether there is a legitimate epistemic authority on the decision being made. If there exists a legitimate epistemic authority on the decision being made, then that authority can set a standard with which to measure the quality of the outcome of the decision-making process. Legitimate epistemic authority is defined by Peter (2016, 137) as "the right to make claims which give others sufficient reasons for belief." In other words, if a person holds legitimate epistemic authority over p, then her claiming p gives sufficient reason for others to believe that p (137–138). An example of a situation where such a legitimate epistemic authority exists is the following: "Suppose a town is considering the plan to build a new bridge across the river that runs through it. [...] And suppose that the town engineer has the expertise to assess whether the planned bridge is stable" (137). The town engineer has legitimate epistemic authority over the decision of whether a proposed bridge is stable or not. She can thus set standards which have to be met by the proposed designs of the bridge. Put differently, the bridge design that is eventually chosen by the citizens (i.e., the outcome of the decision-making process) has to meet the standard of quality set by the town engineer (i.e., the legitimate epistemic authority).

Thus, when a legitimate epistemic authority exists on the collective decision being made, the mixed epistemic conception of democratic legitimacy—which takes the quality of the outcomes of the decision-making process into account—should be used. The quality of the outcomes will be evaluated based on the standards set by the legitimate epistemic authority. When there is no legitimate epistemic authority on the collective decision being made, then no individual's perspective can justifiably be privileged over another's when it comes to evaluating the quality of the outcome of the decision-making process. Since there is no justifiable standard that can be set for the quality of the outcomes of the decision-making process, these outcomes should not be part of the evaluation of the democratic legitimacy of the decision-making process. Thus, the pure procedural epistemic conception of democratic legitimacy should be used.

In the case of policy co-creation practices, a relevant consideration is in which stage of the policy process the co-creation takes place. As mentioned in the first chapter, there are four stages at which co-creation can take place: the problem identification stage, the policy formulation stage, the policy implementation stage, and the policy evaluation stage.

In the problem identification stage of the policy process, there is no legitimate epistemic authority on the decisions being made. Each individual has her own unique set of characteristics, preferences, and experiences from which she comes to a belief about which societal problems need addressing through policy. For instance, a regular commuter exposed to the insufficiencies of the public transport system may push for infrastructure development to be put on the agenda, while a doctor at a public hospital may instead insist that public health should be the top priority. No individual's perspective can be justifiably privileged over another's when it comes to identifying societal problems that need to be addressed. Thus, a pure procedural epistemic conception of democratic legitimacy should be used to evaluate policy co-creation at this stage, as there is no legitimate epistemic authority on which societal problems should be given priority in the policy process, and no justifiable standard can be set for the outcomes of the co-creation process at this stage.

An objection that can be raised here is that some societal problems are more serious than others, and that the perspective of an individual facing these more serious problems should be privileged over that of another individual who is facing a less serious one. For example, a person of color who experiences institutional racism may push for issues of racial injustice to be put on the agenda, while a billionaire businessman may insist that high-bracket income taxes should be lowered to encourage economic growth. One could argue that privileging the perspective of the person of color over the billionaire's in identifying which problem should be addressed by policy is justified under a maximin principle—choosing the alternative where the worst-off are better than in any other alternative (Rawls 2009). However, the collective decision being made in the problem identification stage—"What problems should be addressed by policy?"—is not a zero-sum decision: saying that institutional racism should be addressed through policy does not imply that inefficiently high tax rates should *not* be addressed through policy. Moreover, a policy that serves both of these citizens' interests is better than another which serves only one of them. Thus, all citizens should have equal opportunities to put forward the problems that they believe should be addressed through policy, and the policies created and implemented in the further stages should address these problems as best they can. Deciding on which of these problems should be *prioritized* when not all of them can be addressed to the same extent is a matter for the policy formulation stage.

In the policy formulation stage, there is a case to be made for the existence of legitimate epistemic authorities on some dimensions of the decisions being made. As mentioned earlier, some citizens' perspectives may also be justifiably privileged over others' when it comes to deciding which problems to prioritize over others when not all of them can be addressed by a given policy to the same extent. Using the example of the person of color and the billionaire, the maximin principle provides a justification for privileging the perspective of the person of color over the billionaire. Another case for the existence of a legitimate epistemic authority in the policy formulation stage is that public sector professionals are better able to determine than ordinary citizens whether a certain policy design is feasible to implement or not. Experts in other fields may also have epistemic authority on how policy should be designed in order to address the problems identified

in the first stage effectively. For instance, an epidemiologist has legitimate epistemic authority on how to address disease outbreaks effectively. She should thus be able to set standards for policy designed to control a disease outbreak, such as requiring that a policy eliminate all opportunities for people to be gathered in big groups in an enclosed space. Thus, a mixed epistemic conception of democratic legitimacy should be used to evaluate policy co-creation practices at this stage in order to assess how effective the policy is at addressing the problems that it aims to solve based on the standards that the legitimate epistemic authority sets.

In the policy implementation stage, there is also a case to be made for the existence of legitimate epistemic authorities on some dimensions of the decisions being made. The question of how much compliance is necessary to be able to achieve the goals of policy, as well as how to achieve such levels of compliance are matters for which some individuals are more knowledgeable than others. Take, for example, if a policy was chosen in the second stage requiring people to always stand 1,5 meters away from each other and prohibiting gatherings of more than three people. Local government officials know how their community will respond to certain monitoring and enforcement measures and can thus set the most efficient levels to best achieve the goals of the policy. Thus, a mixed epistemic conception of democratic legitimacy should be used to evaluate policy co-creation practices at this stage in order to assess how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved based on the standards that the legitimate epistemic authority sets.

In the policy evaluation stage, there is also a case to be made for the existence of legitimate epistemic authorities on some dimensions of the decisions being made. Experts in certain fields have specific knowledge and skills to measure the effects of the policy and to interpret these measurements. An epidemiologist knows how to measure risk, prevalence, incidence, and other outcomes that are relevant to evaluating how successful an implemented policy is in addressing a disease outbreak. More importantly, she knows how to interpret these measurements appropriately for an accurate representation of the outcomes of the policy. Thus, a mixed epistemic conception of democratic legitimacy should be used to evaluate policy co-creation practices at this stage in order to assess the accuracy of the judgment of whether the implemented policy was a success or a failure based on the standards that the legitimate epistemic authority sets.

Thus, in evaluating the democratic legitimacy of policy co-creation practices, it is important to note at which stage of the policy process the co-creation is taking place in order to choose the appropriate conception of democratic legitimacy. The pure procedural epistemic conception of democratic legitimacy should be used in evaluating policy co-creation at the problem identification stage, as there is no legitimate epistemic authority on which societal problems should be addressed in the policy process, and no justifiable standard can be set for the outcomes of the co-creation process at this stage. The mixed epistemic conception—which takes the outcomes of the policy co-creation process into account in evaluating democratic legitimacy—should be used in the policy formulation, policy implementation, and policy evaluation stages. This is because there are legitimate epistemic authorities—on how policy should be designed in order to achieve its goals, on how policy should be implemented in order to ensure that it is

effective, and on how to evaluate policies—who can set standards on the quality of the outcomes of policy co-creation practices at these stages.

2.5 Formalizing the framework

What I have done so far is to argue that the two conceptions of democratic legitimacy appropriate to use for evaluating policy co-creation practices are the pure procedural epistemic and mixed epistemic conceptions, and to delineate when each of these conceptions should be used depending on the stage of the policy process that co-creation is taking place in. In this section, I will formalize each of these conceptions of democratic legitimacy into a set of criteria for evaluating policy co-creation practices.

Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy take into account in how far policy co-creation practices promote certain values which are intrinsic to democracy—that is, values that make democratic decision-making morally desirable independent of their consequences (Christiano 2018). What are these intrinsic values of democracy that a policy co-creation practice would have to promote? Two of the most common intrinsic values attributed to democracy are freedom and equality (Christiano 2018).

Freedom is argued to be an intrinsic value of democracy in the following way (Christiano 2018): Each individual has a right to freedom: she ought to be the master of her life, which is shaped by the larger political, economic, and social environment in which she lives. Having liberty would thus mean having control over this larger environment. Democracy gives each citizen this control by giving her a voice in collective decision-making processes that determine what this environment will look like (Gould 1990, 45ff.).

How should a policy co-creation practice be evaluated based on its ability to promote this value of freedom as self-determination? When citizens are able to effectively participate in policy co-creation, citizens are given the opportunity to influence the creation, implementation, and evaluation of policies which shape the environment in which they live. Thus, citizens being able to effectively participate in policy co-creation is a promotion of freedom as self-determination. This is the first criterion in evaluating the democratic legitimacy of policy co-creation practices:

> *Political freedom*: citizens are given the effective opportunity to participate in policy co-creation practices whose outcomes will have an impact on their lives.

Equality is argued to be an intrinsic value of democracy in the following way (Christiano 2018): Society should be structured in such a way that all individuals' interests have an equal chance to be advanced in decisions that determine the political, economic, and social environment that they live under. These interests are diverse because of differences in natural talents, upbringing, and other social and environmental factors. Moreover, people have deep cognitive biases towards their own interests—making it likely that they misrepresent or fail to acknowledge others' interests. Thus, for each

individual's interests to have a chance to be equally advanced in decisions about how to organize societal life, each should be given equal say (Christiano 2004). Democracy gives each individual this equal say in collective decision-making processes.

How should a policy co-creation practice be evaluated based on its ability to promote this value of equality of advancement of interests? When citizens are given equal opportunities to influence the outcome of the policy co-creation process, then each of them are given an equal chance to advance their interests in the creation, implementation, and evaluation of policies. Thus, citizens being given equal opportunities to influence the outcome of policy co-creation practices is a promotion of equal advancement of interests. This is the second criterion in evaluating the democratic legitimacy of policy co-creation practices:

> *Political equality*: citizens are given equal opportunities to influence the outcomes of the policy co-creation process.

Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy also take into account in how far policy co-creation practices are able to generate knowledge based on the information gathered from citizens. How should a policy co-creation practice be evaluated based on its knowledge-generating ability? Peter (2007, 348) argues that with epistemic accounts of democratic legitimacy, in addition to taking account of in how far the *political* values of freedom and equality are promoted, taking account of in how far the *epistemic* values of freedom and equality are promoted should also be done.

Epistemic freedom is promoted insofar as citizens are given the opportunity to form their own beliefs about an issue and to express these beliefs in the way that they see fit (Fernandes 2016; Levi 1990, 1997; Kapitan 1986, 1989). How does epistemic freedom promote the generation of knowledge based on the information gathered from citizens in the policy co-creation process? With the promotion of epistemic freedom in policy co-creation processes, a greater quantity and quality of information is able to be acquired from citizens, which also enables more knowledge to be produced from this information. Take, for example, a policy co-creation process where citizens' inputs are collected in a very structured way (e.g., through yes or no choices, or a ranking from 1–10) versus another policy co-creation process where citizens are asked more open-ended questions (e.g., "What do you feel are the problems in your neighborhood?"). More information is able to be collected from the second process, as the responses that citizens give are not constrained by the structure imposed on them. If, for example, a citizen answers "No" to the question of whether she approves of a park being built in a certain location, she may actually just not want the park in a certain location but want more parks in the neighborhood in general. These insights may not be expressed if citizens are less able to form and express their own beliefs in the way that they see fit. Thus, the promotion of epistemic freedom is the third criterion in evaluating the democratic legitimacy of policy co-creation practices:

> *Epistemic freedom*: citizens are given the opportunity to form their own beliefs about an issue and express these beliefs in the way that they see fit.

Epistemic equality is promoted insofar as citizens have equal opportunities to state their beliefs and their reasons for them, and to have these beliefs and reasons be heard (Erman 2016, 272; Habermas 2015; Christiano 2012; Parkinson 2012). How does epistemic equality promote the generation of knowledge based on the information gathered from citizens in the policy co-creation process? When epistemic equality is promoted, a greater variety of perspectives on the issue are able to be gathered, and each idea is subject to scrutiny from this variety of perspectives as well. Take, for example, a policy co-creation process where "experts" are given much more opportunities to express their beliefs and be heard than ordinary citizens versus one where all are given equal opportunities to speak and be heard. More ideas and perspectives would be gathered from the second process than the first, and these ideas would be more rigorously scrutinized from a variety of perspectives in the second than in the first. Thus, the promotion of epistemic equality is the fourth criterion in evaluating the democratic legitimacy of policy co-creation practices:

> *Epistemic equality*: citizens have equal opportunities to state their beliefs and their reasons for them, and to have these beliefs and reasons be heard.

The pure procedural epistemic conception of democratic legitimacy—which I have argued is the appropriate one to use for evaluating policy co-creation practices at the problem identification stage—take these four criteria of political freedom, political equality, epistemic freedom, and epistemic equality into account. The mixed epistemic conception of democratic legitimacy—which I have argued is the appropriate one to use for evaluating policy co-creation practices at the policy formulation, policy implementation, and policy evaluation stages—also takes these four criteria into account, but also assesses the quality of the outcomes of the policy co-creation process.

The quality of the outcomes of policy co-creation practices at the policy formulation stage are assessed in terms of *how effective the policy is at addressing the problems that it aims to solve*. The quality of the outcomes of policy co-creation practices at the policy implementation stage are assessed in terms of *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved*. The quality of the outcomes of policy co-creation practices at the policy evaluation stage are assessed in terms of *the accuracy of the judgment of whether the implemented policy was a success or a failure*.

The set of criteria that will be used to evaluate the democratic legitimacy of policy co-creation at each stage are summarized in the table below:

2.6 Conclusion

In this chapter, I argued for two conceptions of democratic legitimacy that are appropriate to use for evaluating policy co-creation practices: the pure procedural epistemic and mixed epistemic conceptions. I then formalized these conceptions into criteria for evaluating the democratic legitimacy of policy co-creation practices, which I will use as

	Conception of democratic legitimacy	Criteria for procedure (for all stages)	Criteria for outcomes
Problem identification	Pure procedural epistemic	1. Political freedom 2. Political equality 3. Epistemic freedom 4. Epistemic equality	None
Policy formulation	Mixed epistemic		Effectiveness of policy in addressing problems it aims to solve
Policy implementation	Mixed epistemic		Effectiveness of policy monitoring and enforcement in ensuring compliance
Policy evaluation	Mixed epistemic		Accuracy of judgments on implemented policy

Table 2.3: A framework for evaluating the democratic legitimacy of policy co-creation

a framework for analyzing the effects of ICT's on the democratic legitimacy of these practices.

Under the first dimension of the taxonomy of different conceptions of democratic legitimacy, there are the pure procedural, pure instrumental, and mixed conceptions. I argued in Section 2.2 that the pure procedural and mixed conceptions are the appropriate ones to use for evaluating the democratic legitimacy of policy co-creation practices by showing how purely instrumental conceptions are at best, insufficient, and at worst, problematic. They fail to defend or justify why a policy that is co-created with citizens is better than one made by public sector professionals without any citizen consultation, if both give rise to the same outcomes. Even more worryingly, purely instrumental accounts of democratic legitimacy could justify violations of values that are intrinsic to democracy: freedom as self-determination and equality of advancement of interests. Pure procedural and mixed conceptions are able to take into account in how far policy co-creation practices promote values that are intrinsic to democracy, and are thus the appropriate ones to use for evaluating policy co-creation practices.

Under the second dimension of the taxonomy of different conceptions of democratic legitimacy, there are the epistemic and non-epistemic conceptions. I argued in Section 2.3 that epistemic conceptions are appropriate for evaluating policy co-creation practices as they are able to take into account how much knowledge is generated from the information that is gathered from citizens.

Combining the two dimensions of the taxonomy, the conceptions that I have argued are appropriate for evaluating policy co-creation practices are the pure procedural epistemic and the mixed epistemic conceptions. The pure procedural epistemic conception takes into account (i) in how far policy co-creation practices promote values that are intrinsic to democracy and (ii) in how far it is able to generate knowledge based on the information gathered from citizens. The mixed epistemic conception also takes (i) and (ii) into account, and in addition, also takes the quality of the outcomes of the policy co-creation

process into account in evaluating its democratic legitimacy.

I then delineated in Section 2.4 that the pure procedural epistemic conception should be used for evaluating the democratic legitimacy of policy co-creation practices in the problem identification stage, and that the mixed epistemic conception should be used for the policy formulation, policy implementation, and policy evaluation stages. When there is a legitimate epistemic authority on the issue being decided on, then that authority can set a justifiable standard with which to measure the quality of the outcome of the decision-making process. The mixed epistemic conception—which takes the quality of the outcomes into account, in addition to the quality of the procedure—should be used in these cases. When such a legitimate epistemic authority does not exist on the issue being decided on, then there is no justifiable standard with which to measure the quality of the outcome of the decision-making process. The pure procedural epistemic conception—which does not take the quality of the outcomes into account—should be used in these cases. In the problem identification stage, there is no legitimate epistemic authority on which societal problems should be addressed in the policy process. Thus, the pure procedural epistemic conception should be used in evaluating the democratic legitimacy of policy co-creation at this stage. In the policy formulation, policy implementation, and policy evaluation stages, there are legitimate epistemic authorities on how policy should be designed in order to achieve its goals, on how policy should be implemented in order to ensure that it is effective, and on how to evaluate policies. Thus, the mixed epistemic conception should be used in evaluating the democratic legitimacy of policy co-creation at these stages.

Finally, I formalized the framework into a set of criteria for evaluating policy co-creation practices at each of the four stages of the policy process in Section 2.5. Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy take into account in how far policy co-creation practices promote certain values which are intrinsic to democracy—that is, values that make democratic decision-making morally desirable independent of their consequences (Christiano 2018). The two most common intrinsic values attributed to democracy are freedom as self-determination and equality of advancement of interests (Christiano 2018). Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy also take into account in how far policy co-creation practices are able to generate knowledge based on the information gathered from citizens. Peter (2007, 348) argues that with epistemic accounts of democratic legitimacy, in addition to taking account of in how far the *political* values of freedom and equality are promoted, taking account of in how far the *epistemic* values of freedom and equality are promoted should also be done. These democratic values serve as criteria for evaluating the democratic legitimacy of policy co-creation practices in all stages of the policy process:

1. *Political freedom*: citizens are given the effective opportunity to participate in policy co-creation practices whose outcomes will have an impact on their lives.

2. *Political equality*: citizens are given equal opportunities to influence the outcomes of the policy co-creation process.

3. *Epistemic freedom*: citizens are given the opportunity to form their own beliefs about an issue and express these beliefs in the way that they see fit.

4. *Epistemic equality*: citizens have equal opportunities to state their beliefs and their reasons for them, and to have these beliefs and reasons be heard.

For policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages of the policy process, the outcomes of the co-creation process should also be evaluated. The quality of the outcomes of policy co-creation practices at the policy formulation stage are assessed in terms of *how effective the policy is at addressing the problems that it aims to solve*. The quality of the outcomes of policy co-creation practices at the policy implementation stage are assessed in terms of *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved*. The quality of the outcomes of policy co-creation practices at the policy evaluation stage are assessed in terms of *the accuracy of the judgment of whether the implemented policy was a success or a failure*.

A summary of the criteria for evaluating the democratic legitimacy of policy co-creation practices at each stage of the policy process can be found in Table 2.3.

An important question to raise about the framework that I have presented concerns the status of the different criteria that I presented for evaluating the democratic legitimacy of policy co-creation practices. Do the four democratic values have priority over the quality of the outcomes? Do political values matter more than epistemic values? This thesis will not touch upon these questions of which of the criteria are more important than the others, as I merely aim to use this framework to identify potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation in terms of these criteria, and not to argue that some specific criteria should be prioritized over others in these evaluations.

In Chapters 3 and 4, I will use this framework to identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation based on how it may promote or undermine the four democratic values (political freedom, epistemic freedom, political equality, and epistemic equality), and how it may promote or undermine the quality of the resulting policy (for co-creation at the policy formulation, policy implementation, and policy evaluation stages). I then come up with general design guidelines that aim to maximize the potential benefits and minimize the potential risks identified. In Chapter 3, I focus on the first and most basic level of influence that ICT's have on policy co-creation practices: the addition of a digital layer. In Chapter 4, I focus on the second level of influence of ICT's on policy co-creation: the creation of new practices of policy co-creation.

3 ICT's adding a digital layer to traditional practices of policy co-creation

3.1 Introduction

In this chapter, I will use the framework developed in Chapter 2 to evaluate the democratic legitimacy of policy co-creation practices which have been enabled by ICT's on the first and most basic level of influence: the addition of a digital layer through which co-creation takes place.

The framework for analysis developed in Chapter 2 involves evaluating in how far policy co-creation practices meet the following four criteria:

1. *Political freedom*: citizens are given the effective opportunity to participate in policy co-creation practices whose outcomes will have an impact on their lives.
2. *Political equality*: citizens are given equal opportunities to influence the outcomes of the policy co-creation process.
3. *Epistemic freedom*: citizens are given the opportunity to form their own beliefs about an issue and express these beliefs in the way that they see fit.
4. *Epistemic equality*: citizens have equal opportunities to state their beliefs and their reasons for them, and to have these beliefs and reasons be heard.

In addition, for policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages, the quality of the outcomes of the co-creation process are also evaluated in terms of the following criteria: *how effective the policy is at addressing the problems that it aims to solve* (policy formulation), *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved* (policy implementation), and *the accuracy of the judgment of whether the implemented policy was a success or a failure* (policy evaluation).

I will use this framework to identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices based on how they may promote or undermine the four democratic values (political freedom, epistemic freedom, political equality, and epistemic equality), and how they may promote or undermine the quality of the outcomes of the process (for co-creation at the policy formulation, policy implementation, and policy evaluation stages). I then come up with general design guidelines to maximize the potential benefits and minimize the potential risks identified.

The policy co-creation practices that will be evaluated in this chapter are those that have been influenced by ICT's on the first and most basic level: the addition of a

digital layer through which co-creation takes place (Lember 2018, 117ff.). Three types of ICT-enabled co-creation practices characterize this level of influence, namely: (1) e-consultations, (2) e-voting and e-surveys, and (3) platforms.

E-consultations add a digital layer to public deliberative processes such as town hall meetings and smaller scale in-person citizen consultations (Aichholzer and Rose 2020, 106–107). An example of such a process is the European Commission's Citizens' Dialogues, which are "public debates with European Commissioners and other EU decision-makers" on a specific topic (European Commission 2019). These events are structured as question and answer sessions which are livestreamed with the opportunity to participate through social media (specifically, through Twitter) as well.

E-voting adds a digital layer on direct democracy, where citizens vote on specific policies or laws (Aichholzer and Rose 2020, 108–113). An example of this is participatory budgeting, where citizens get to decide on specific projects to be funded by the government. A specific implementation is Paris' "Budget Participatif", where all Parisian residents can vote for up to ten projects located where they live or work (Cabannes 2017). E-surveys are another example of e-voting procedures. A specific implementation is the E-Survey of Road users' Attitudes (ESRA), which "aims to provide scientific support to road safety policy making at the national and international levels" (ESRA 2020). The survey has been conducted in thirty-eight countries, and data have been used by the Dutch Institute for Road Safety Research (SWOV) to make specific policy recommendations (Wetenschappelijk Onderzoek Verkeersveiligheid 2020).

Platforms are defined as technologies that "interconnect people, allowing them to actively observe, report, collect, analyze, provide and disseminate information" (Janssen and Estevez 2013, S5). An implementation of this is Sapelli, an open-source software which aims to enable people with no or limited literacy to use smartphones and tablets to collect, share, and analyze spatial data to tackle problems such as illegal logging, wildlife crime, and wheelchair accessibility (Sapelli 2017). A particular use of the platform involved reporting wildlife crime in southeastern Cameroon (Altenbuchner 2017). Indigenous Baka hunter-gatherer and Bantu farming communities were given a touchscreen phone with Sapelli installed, with which they could report GPS locations, take photo and video recordings, and even note what types of weapons the criminals were using.

There are three ways in which the addition of a digital layer has changed policy co-creation practices. Firstly, ICT's have changed how citizens gain *access* to the policy co-creation process, both formally and effectively. ICT's enable people to participate in the policy co-creation process remotely from a place and time that is convenient to them (Janssen and Helbig 2018; Lember 2018; Millard 2018). However, ICT's also present a barrier to participation for people who are not technically literate and who have certain disabilities (Norris 2001; Van Deursen and Van Dijk 2011; Meijer 2011; Clark, Brudney, and Jang 2013; Townsend 2013; Mergel 2012; Kornberger et al. 2017).

Secondly, ICT's have enabled increased *anonymity* among participants in the policy co-creation process . When participating virtually in policy co-creation, citizens have the option to choose how anonymous they will be (Dahlberg 2001; Witschge 2004; Stromer-Galley 2002; Leshed 2009; Santana 2014; Friess and Eilders 2015; Strandberg and Berg

2015). They can, for instance, choose not to show their face or withhold personal details about themselves in virtual meetings and interactions.

Finally, ICT's have changed the way in which participants in the policy co-creation process is by enabling *virtual interactions* among participants. Face-to-face interactions are replaced with virtual communication, which is different in terms of being able to see each other's faces and being able to react more immediately to one another (Dahlberg 2001; Stromer-Galley 2002; Witschge 2004; Albrecht 2006; Leshed 2009; Delborne et al. 2011).

For each of these three channels of influence (access, anonymity, and virtual interactions), I will identify the potential benefits and risks to the democratic legitimacy of policy co-creation practices based on how they may promote or undermine the four democratic values (political freedom, epistemic freedom, political equality, and epistemic equality), and how they may improve or deteriorate the quality of the outcomes of the process (for co-creation at the policy formulation, policy implementation, and policy evaluation stages). I then come up with general design guidelines to maximize the potential benefits and minimize the potential risks identified.

The chapter will proceed as follows: In Section 3.2, I will discuss formal and effective access to the policy co-creation practices afforded by ICT's. In Section 3.3, I will discuss the anonymity afforded to participants in ICT-enabled policy co-creation. In Section 3.4, I will discuss the virtual interactions which take place in ICT-enabled policy co-creation practices. I conclude in Section 3.5 with a summary of the identified potential benefits and risks to the democratic legitimacy of policy co-creation, and the general design guidelines formulated based on this analysis.

3.2 Access to the policy co-creation process

The first channel of influence that the digital layer has on policy co-creation practices is *access*. There are two dimensions of 'access' to policy co-creation practices that I will discuss. The first dimension concerns *formal* access in terms of reach: the increase or decrease in the number of citizens who are given the formal opportunity to participate in policy co-creation as a result of the digital layer. The second dimension concerns *effective* access which takes the technical literacy and ability of citizens into account. Some citizens are more able than others to use technology effectively, which then affects how much they are able to participate in the policy co-creation practice.

After a general discussion of formal and effective access to policy co-creation as a result of the digital layer (Section 3.2.1 and 3.2.2), I then discuss (i) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the four democratic values of political freedom, epistemic freedom, political equality, and epistemic equality (Section 3.2.3), (ii) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the quality of the outcomes in the policy formulation, policy implementation, and policy evaluation stages (Section 3.2.4), and (iii) the general design guidelines that can be drawn from the analyses in (i)

and (ii) (Section 3.2.5).

3.2.1 Formal access: Increased reach

ICT's increase formal access to the policy co-creation process by getting rid of certain logistical constraints that would have made certain citizens' participation impossible otherwise. One constraint of traditional policy co-creation practices such as town hall meetings, consultations, and referenda is the requirement on citizens to show up at a certain place at a certain time to be able to participate in the decision-making process (Janssen and Helbig 2018; Lember 2018; Millard 2018). This is difficult for some citizens, such as parents without access to a babysitter or those who live or work far away from the venue and cannot afford to commute. E-consultations and e-voting enable citizens to provide their inputs into the decision-making process from wherever they are. Take, for example, the European Commission's Citizens' Dialogues (European Commission 2019). The matters discussed in these meetings are of interest to people from all over Europe, and it would have been improbable (and/or very expensive) to have all of these interested people gather at one place at the same time to contribute to the discussion. The online setting gives people the opportunity to participate from wherever they are.

Another constraint of traditional policy co-creation practices is a disconnect between citizens with access to valuable information and the institutions that can act upon it (Janssen and Helbig 2018; Lember 2018; Millard 2018). This is particularly relevant in policy monitoring and enforcement activities that are done by citizens. Traditional co-creation practices in the policy implementation stage would have involved citizens and public sector professionals coming into direct contact to facilitate this sharing of information. This is made difficult by public sector professionals not knowing that local citizens hold this valuable information, and by local citizens not knowing that public sector professionals can act upon the valuable information that they possess. This is evident in the case of wildlife crime, for instance: Local communities have on-the-ground knowledge and access to the illegal activities that are taking place. However, public sector professionals cannot easily travel to the local communities, and the locals also cannot easily come into contact with the public sector professionals. The Sapelli platform helps by fostering this direct connection between local communities and public sector professionals (Sapelli 2017).

Thus, ICT's are able to improve the formal access of citizens to the policy co-creation process by getting rid of both of these constraints: they give citizens the opportunity to participate in policy co-creation in a place and time that is convenient for them, and they are able to connect citizens with access to valuable information and the institutions that can act upon it.

3.2.2 Effective access: The effects of technical (il)literacy

Even while ICT's increase formal access to policy co-creation processes, they can also decrease effective access for some citizens who lack the ability to understand and effectively utilize these technologies. This inequality of effective access has been called the

'digital divide' (Norris 2001; Van Deursen and Van Dijk 2011). In particular, the elderly, the uneducated, and persons with sensory and motor disabilities might be ill-equipped to provide their inputs to collective decision-making processes with technological tools.

With traditional policy co-creation practices, technically challenged or illiterate groups of people may have faced significantly less challenges to participating in the decision-making process. Without having to navigate multiple layers of digital interfaces, they could simply listen and speak up in a town hall meeting or consultation, cast a vote in a voting booth, answer a surveyor's questions, or report certain issues to a public sector professional. Technology becomes a barrier for effective participation by imposing a requirement on the level of technical literacy that citizens have to possess in order to effectively participate. The empirical evidence on the extent to which this technical illiteracy exists is mixed: On the one hand, new media and online networks have been shown to increase the levels of co-creation and information exchange that takes place between citizens and their government, without necessarily disadvantaging certain vulnerable groups (Meijer 2011; Clark, Brudney, and Jang 2013). Townsend (2013) and Mergel (2012), on the other hand, show that educated professionals are more likely than many other social groups to engage in ICT-enabled policy co-creation.

People with sensory and motor difficulties or disabilities could be directly assisted by actual people in traditional policy co-creation settings. Assistance may be less effective in digital settings because of the lack of direct interaction involved. Providing effective assistance through guides, chat boxes, and telephone hotlines is more difficult than providing direct assistance in person. Take, for instance, a physical referendum and its e-voting counterpart. With the physical referendum, individuals show up to a polling station, where there are people who could directly guide citizens with sensory and motor disabilities through the process of casting a vote in real time. With e-voting, assistance may only be provided through guides, chat boxes, or telephone hotlines, which themselves may be difficult to navigate.

Thus, even while ICT's increase formal access to policy co-creation processes, they may also decrease effective access for some citizens who lack the ability to understand and effectively utilize these technologies.

3.2.3 Potential benefits and risks of access on democratic values

So far, I have shown that ICT's may increase formal access to the policy co-creation process by getting rid of certain logistical constraints that would have made certain citizens' participation impossible otherwise. However, ICT's may also decrease effective access for some citizens who lack the ability to understand and effectively utilize these technologies.

How do these effects of ICT's on formal and effective access to policy co-creation practices affect their democratic legitimacy? I first discuss the potential benefits and risks to the democratic legitimacy of policy co-creation in terms of in how far the four democratic values of *political freedom*, *epistemic freedom*, *political equality*, and *epistemic equality* are promoted or undermined.

Political freedom is promoted insofar as citizens are given the *effective* opportunity to

participate in decision-making processes whose outcomes will have an impact on their lives. The emphasis on effective opportunities entails that not only should access to the decision-making process be *formally* increased, but also *effectively* increased. This may be undermined by how the digital environment may systematically exclude certain groups of citizens from participating in the decision-making process, such as the elderly, the uneducated, and those with sensory or motor disabilities.

To what extent do citizens have more of an effective opportunity in ICT-enabled policy co-creation practices than in non-ICT-enabled ones? The evidence is mixed: On the one hand, new media and online networks have been shown to increase the levels of co-creation and information exchange that takes place between citizens and their government, without necessarily disadvantaging certain vulnerable groups (Meijer 2011; Clark, Brudney, and Jang 2013). Townsend (2013) and Mergel (2012), on the other hand, show that educated professionals are more likely than many other social groups to engage in ICT-enabled policy co-creation. Moreover, Kornberger et al. (2017) finds that ICT-enabled policy co-creation has only been minimally adopted despite its widespread availability.

Epistemic freedom is promoted insofar as citizens are able to form their own beliefs about an issue and are able to express these beliefs in the way that they see fit. Formal access can promote epistemic freedom by enabling more citizens to participate in deliberative processes first-hand, instead of giving their input and hearing about what transpired in these discussions through second-hand (or third-hand) sources. This reliance on second-hand or third-hand sources may mean that the absent citizens' inputs may be misrepresented to the rest of the participants, and the inputs of the rest of the participants are also misrepresented to the absent citizens. The ability to directly participate through e-consultations gives citizens the opportunity to provide their input in the way that they intend, and to hear others' input first-hand and to come to their own judgment based on this direct interaction. Niemeyer (2011) provides empirical evidence from mini-publics of such an 'emancipatory effect' of access to deliberation processes. He explains:

> Before deliberation, symbolic politics—or at least the mere presence of potent symbols—distorted participants' preferences. [...] Deliberation successfully corrected the influence of symbolic politics because it provided both the incentive and the means to develop positions on an intersubjective set of recognized issues that extended beyond the narrow set of unhelpful symbolic ones. (125)

However, *epistemic freedom* may also be undermined by citizens losing effective access to the decision-making procedure as a result of the digital layer. Time and effort spent struggling to navigate the technologies used in deliberative process takes away from citizens' ability to contribute their inputs and to hear others' inputs as well.

Political equality is promoted insofar as citizens have an equal say in the decision-making process. By increasing formal access, ICT's are able to more equally distribute the power to influence the outcome of the decision-making process among all citizens.

The constraints imposed by traditional co-creation processes tend to disproportionately affect certain groups of citizens (Townsend 2013; Mergel 2012). For instance, poorer citizens may not be able to afford a babysitter to watch their children, to miss a shift at work, or to commute to the town hall. Richer citizens, on the other hand, are more easily able to do these things. Adding a digital layer on policy co-creation practices has the potential to equalize opportunities to participate in the decision-making process by removing these logistical constraints that tend to disproportionately affect certain groups of citizens.

However, *political equality* may be undermined by systematically excluding a different group of people: the technically challenged or illiterate (Smith et al. 2009). In a participatory budgeting project in Berlin, participants were reported to be "mostly young and middle-aged citizens of up to 50 years old, with a level of education higher than in the general population" (Shkabatur, Fletcher, and Gakhal 2020). This means that the young and the educated had more say in what projects are funded than the elderly and less-educated.

Epistemic equality is promoted insofar as citizens have equal opportunities to publicly state their beliefs and their reasons for them, and to have these beliefs and reasons be heard. The effects of ICT's on epistemic equality are similar to its effects on political equality: By increasing formal access, more citizens are able to publicly state their beliefs and their reasons for them, and to have these beliefs and reasons be heard. Those who were previously unable to do so, such as lower-income citizens, now have more opportunities to participate in the decision-making process.

However, *epistemic equality* may also be undermined by disabling the technically challenged and illiterate to do the same (Smith et al. 2009).

Thus, the effects of ICT's on the access that citizens have to policy co-creation practices have the following potential benefits and risks in terms of in how far they promote or undermine the four democratic values:

1. *Political freedom*
   - \+ More citizens are given formal access to policy co-creation practices.
   - – Effective access is withheld from some groups of citizens.
2. *Epistemic freedom*
   - \+ More opportunities are given to citizens for first-hand participation in policy co-creation.
   - – Those without effective access cannot participate first-hand.
3. *Political equality*
   - \+ Logistical constraints are removed on some groups of citizens.
   - – Technological constraints are added on other groups of citizens.
4. *Epistemic equality*

+ More groups have opportunities for first-hand participation in policy co-creation.
– Technological constraints withhold first-hand participation from other groups.

3.2.4 Potential benefits and risks of access on outcomes

In addition to the four criteria discussed in the previous subsection, the outcomes of policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages should also be evaluated in terms of: *how effective the policy is at addressing the problems that it aims to solve* (policy formulation), *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved* (policy implementation), and *the accuracy of the judgment of whether the implemented policy was a success or a failure* (policy evaluation).

In the policy formulation stage, the decision being made is "What is the most effective policy in order to best address the problem(s) that need to be solved?" Increasing formal access to the decision-making process—through online collaborative design platforms, for example—allows for a greater number and variety of ideas to be put forward. This has the potential to increase the quality of the eventual design of policy in terms of its ability to solve the problems it seeks to address (Hong and Page 2004; Dewey and Rogers 1954; Anderson 2006). The lack of effective access afforded to certain groups of citizens may have the opposite effect: some valuable ideas are not considered because those who possess them are not able to participate in the decision-making process.

In the policy implementation stage, the decision being made is "How should the policy be monitored and enforced in order to ensure that its goals are achieved?" Increasing formal access to the decision-making process—through platforms such as Sapelli—increases the amount of monitoring and enforcement that happens on the ground at smaller cost than would be the case with traditional co-creation practices (Sapelli 2017). This leads to higher quality of policy implementation in terms of an increase in compliance with the policy and a decrease in violations of the policy. The lack of effective access afforded to technically challenged or illiterate groups may decrease this quality either through giving false data as input because of mistakes resulting from difficulties in navigating the technology, or the lack of input being given at all because of these difficulties.

In the policy evaluation stage, the decision being made is "To what extent is the policy a success or a failure?" Increasing formal access to the decision-making process encourages the policy to be evaluated from more perspectives and to take more considerations into account (Harding 1991; Longino 1990). This can result in the evaluation being of better quality in terms of how thoroughly it was done. The lack of effective access given to certain groups of citizens would mean that some perspectives and considerations are not taken into account, decreasing the quality of the evaluation being done.

Thus, the effects of ICT's on the access that citizens have to policy co-creation practices have the following potential benefits and risks in terms of the quality of outcomes:

+ A greater number and variety of inputs can be acquired with more formal access.
– The ideas of those with less effective access are not given attention to.

3.2.5 General design guidelines

The identified potential benefits and risks of ICT's effects on formal and effective access to the democratic legitimacy of policy co-creation are summarized below:

1. *Political freedom*
   + More citizens are given formal access to policy co-creation practices.
   – Effective access is withheld from some groups of citizens.
2. *Epistemic freedom*
   + More opportunities are given to citizens for first-hand participation in policy co-creation.
   – Those without effective access cannot participate first-hand.
3. *Political equality*
   + Logistical constraints are removed on some groups of citizens.
   – Technological constraints are added on other groups of citizens.
4. *Epistemic equality*
   + More groups have opportunities for first-hand participation in policy co-creation.
   – Technological constraints withhold first-hand participation from other groups.
5. *Quality of outcomes*
   + A greater number and variety of inputs can be acquired with more formal access.
   – The ideas of those with less effective access are not given attention to.

Given these potential benefits and risks to the democratic legitimacy of policy co-creation, how can ICT-enabled policy co-creation be designed in order to maximize the potential benefits and minimize the potential risks identified? I argue for two general design guidelines which can accomplish this: (1) making both physical and virtual opportunities for participation in policy co-creation practices available, and (2) collaborating on the design of ICT-enabled policy co-creation practices with groups of citizens whose effective access may be threatened.

The first is to make both physical (i.e., traditional) and virtual (i.e., ICT-enabled) opportunities for participating in policy co-creation practices available (Nielsen et al. 2020, 336). In this way, formal access to the decision-making processes is increased by the reach of ICT's, while the effective access of those who are technically challenged or illiterate is not compromised—maximizing the identified benefits and minimizing the identified risks to the democratic legitimacy of policy co-creation outlined above. An example of this is that in Paris' "Budget Participatif", the voting process for the projects to be funded is held both in physical locations, as well as online (Cabannes 2017).

The second is to collaborate on the design of ICT-enabled policy co-creation practices with groups of citizens whose effective access may be threatened by the use of ICT's. This further minimizes the potential risk that decreased effective access may have on the democratic legitimacy of policy co-creation practices. This is what Sapelli has done with the indigenous communities that they work with to combat wildlife crime. They consult directly with the local people who will use the platform, incorporating local ideas and icon designs into the interface (Sapelli 2017). Moreover, training sessions are also conducted to ensure that citizens know how to properly use the platform (Sapelli 2017).

Thus, the two general design guidelines I propose—(1) making both physical and virtual opportunities for participation in policy co-creation practices available, and (2) collaborating on the design of ICT-enabled policy co-creation practices with groups of citizens whose effective access may be threatened—can maximize the potential benefits and minimize the potential risks that ICT's effect on access to policy co-creation practices may have on their democratic legitimacy.

3.3 Increased anonymity

The second channel of influence that the digital layer has on policy co-creation practices is by enabling *anonymity* in participation in these practices. Citizens are able to contribute their inputs to the process without being in the physical presence of others.

As with the previous section, I will first discuss how ICT's enable greater anonymity in participation in policy co-creation practices, and then discuss (i) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the four democratic values of political freedom, epistemic freedom, political equality, and epistemic equality (Section 3.3.1), (ii) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the quality of the outcomes in the policy formulation, policy implementation, and policy evaluation stages (Section 3.3.2), and (iii) the general design guidelines that can be drawn from the analyses in (i) and (ii) (Section 3.3.3).

E-consultations add a digital layer on traditional deliberative co-creation practices, such as town hall meetings (Aichholzer and Rose 2020, 106–107). In these traditional settings, citizens who are participating are all in the physical space together, where they can see who is speaking and how others are reacting to what is being said. In other words, they are aware that they are being watched. In e-consultations, on the other hand, citizens can join discussions without being visible to the rest of the participants by simply watching the livestream without turning on their cameras and sending in their inputs through social media (e.g., through Twitter). These two options are available in, for instance, the European Commission's Citizens' Dialogues (European Commission 2019).

E-voting and e-survey technologies add a digital layer on traditional aggregative decision-making process such as referenda and in-person survey administration (Aichholzer and Rose 2020, 108–113). Referenda involve processes such as waiting in line,

registration and identity verification, and the actual act of casting one's vote—where citizens come into contact with other citizens who are also voting or facilitating the voting process. With e-voting technologies, the process becomes solitary at every stage. In-person survey administration involves the surveyor and the respondent being in direct physical contact with each other, while with e-surveys a respondent is left alone to answer the questions by herself.

Platforms add a digital layer to the monitoring and enforcement of policies by citizens (Janssen and Estevez 2013, S5). With traditional practices, a citizen would have to physically show up to a certain agency or institution and file a report in person, which involves being seen by other people while doing so. Platforms enable this process to be completely private, without there being witnesses to the monitoring and enforcement activities taking place. With the Sapelli platform, for instance, locals need not show up physically to a government agency office and risk exposing their identities to people who may be involved in the wildlife trade (Sapelli 2017).

In what follows, I discuss (i) the potential benefits and risks that ICT's bring in terms of how increased anonymity affects the four democratic values of political freedom, epistemic freedom, political equality, and epistemic equality, (ii) the potential benefits and risks that ICT's bring in terms of how increased anonymity affects the quality of the outcomes in the policy formulation, policy implementation, and policy evaluation stages, and (iii) the general design guidelines that can be drawn from (i) and (ii).

3.3.1 Potential benefits and risks of anonymity on democratic values

So far, I have shown how e-consultations, e-voting and e-surveys, and platforms increase opportunities for anonymity in the policy co-creation process. How does this increased anonymity affect the democratic legitimacy of policy co-creation practices? I first discuss the potential benefits and risks in terms of the four democratic values of *political freedom*, *epistemic freedom*, *political equality*, and *epistemic equality*.

Anonymity promotes *political freedom* by giving more citizens the effective opportunity to participate in decision-making processes. Anonymity is able to ensure that citizens can contribute their input into the process without endangering their reputations or even their security (Stromer-Galley 2002). In traditional town hall meetings, citizens may be hesitant to publicly express their beliefs for fear of negative consequences to their reputations. The anonymity that e-consultations are able to provide removes this apprehension. Traditional methods of participation in policy monitoring and enforcement also presents threats to the security of citizens. The anonymity that platforms are able to provide ensures that citizens can contribute to this process without fearing for their safety.

Anonymity promotes *epistemic freedom* by encouraging individuals to form their own beliefs about the issue at hand and to express these beliefs in the way that they would like. Anonymity reduces the pressure on citizens to publicly conform to views that are seen as the status quo for fear of repercussions (Leshed 2009). In a traditional town hall meeting, for instance, if most participants loudly cheer for a proposal to open up businesses in the middle of a pandemic, a citizen who supports keeping them closed may

be discouraged from openly opposing such strong support. E-consultations, by affording anonymity, alleviates this social pressure and ensures that citizens with unpopular views are able to hold these beliefs and to express them publicly. The social interactions that occur in traditional voting processes may unduly influence a citizen's decision away from her actual beliefs, and e-voting removes this potential source of coercion. In-person administration of surveys may exert pressure on respondents to provide answers that are not in line with what they actually believe in order to avoid the disapproval of the surveyor. E-surveys remove this source of pressure.

Anonymity promotes *political equality* by giving citizens holding a variety of views an equal say in the decision-making process. Anonymity takes away barriers to those holding unpopular or controversial views from being able to contribute their input into the decision-making process (Leshed 2009; Dahlberg 2001; Witschge 2004). E-consultation is able to provide this safe space for those holding unpopular or controversial views to contribute their inputs to the decision-making process by providing a level of anonymity. Platforms also encourage citizens who might otherwise not want to be labelled 'snitches' to contribute to the monitoring and enforcement of policies without revealing their identities However, anonymity may also encourage the opposite effect by enabling certain positions to be disproportionately represented through the creation of fake accounts with the intention of 'trolling'—"malicious online behaviour, intended to disrupt interactions, aggravate interactional partners and lure them into fruitless argumentation" (Coles and West 2016, 233).

Anonymity promotes *epistemic equality* by giving citizens equal opportunities to publicly state their beliefs and their reasons for them, and to have these beliefs and reasons be heard. Anonymity ensures that the citizens' identities do not bias the amount of attention given to their views based on their reputation or standing (Dahlberg 2001, 14; Witschge 2004, 116; Strandberg and Berg 2015, 167). Martin and Marks (2019) point out traits that certain 'hard messengers'—who are listened to because they possess some form of status over their audience—have: (i) socio-economic position, (ii) competence, (iii) dominance, and (iv) attractiveness. Possessing these traits make a person more likely to be heard, and anonymity removes some of this influence and in doing so, equalizes the playing field for all. For instance, in a traditional town hall meeting, the beliefs of a well-respected doctor might be given more airtime than the beliefs of a college dropout. E-consultation, by affording anonymity, is able to provide for more equal opportunities for each citizen to publicly express her beliefs—no matter what her social standing or reputation may be. In traditional methods of citizen participation in policy monitoring and enforcement, the social standing and reputation of the citizen may also determine how much attention is given to her input. Platforms anonymize the identity of the contributing citizen, and is able to contribute to a more equal treatment of each citizen's input.

Thus, the opportunities for anonymity provided by ICT's to participants in policy co-creation practices have the following potential benefits and risks in terms of in how far they promote or undermine the four democratic values:

1. *Political freedom*

   + Participants are able to contribute inputs to the policy co-creation process without fear of harm.

2. *Epistemic freedom*
   + There is less pressure to conform to status quo views.
3. *Political equality*
   + Citizens with unpopular views are provided a platform to express these views.
   – Certain views may be disproportionately represented with the creation of "fake" profiles
4. *Epistemic equality*
   + The identity of the contributing citizen does not bias how her views are received by other participants

3.3.2 Potential benefits and risks of anonymity on outcomes

In addition to the four criteria discussed in the previous subsection, the outcomes of the policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages should also be evaluated in terms of: *how effective the policy is at addressing the problems that it aims to solve* (policy formulation), *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved* (policy implementation), and *the accuracy of the judgment of whether the implemented policy was a success or a failure* (policy evaluation).

Anonymity in the decision-making process also means that citizens are less accountable for the input that they provide (Friess and Eilders 2015, 326). This accountability may entail rewards for good input (e.g., an improved reputation) or punishments for bad input (e.g., legal action). The lack of such accountability may fail to incentivize contributing good input and avoiding bad input, which may compromise the quality of the outcomes of the policy co-creation process.

In the policy formulation and policy evaluation stages, the lack of accountability may mean that citizens do not really think their contributions through as much as they would have had their reputations been on the line. For instance, Santana (2014) finds that anonymity has an adverse effect on the quality of discussions in online deliberative settings. This lack of effort may contribute to worse ideas being put on the table, and subjecting these ideas to less scrutiny and critical evaluation. The resulting policy and evaluation of the policy may thus be of lower quality.

In the policy implementation stage, citizens may be less careful in what they report if there are less chances of them facing negative consequences for faulty information (Friess and Eilders 2015). Even worse, they may even be encouraged to provide this faulty information *on purpose* to further some pernicious goal that they may have. An example of this is a citizen reporting that another citizen whom she dislikes committed some crime in order to get her in trouble. Citizens may also choose not to report information that they have if there are no rewards for doing so. This leads to a decline

in the quality of policy implementation: valuable information is not contributed, and faulty information seeps into the decision-making process.

Thus, a potential risk that increased opportunities for anonymity afforded by ICT's in policy co-creation is that they lessen the accountability that participants have for the quality of their contributions. This may deteriorate the quality of the outcomes of policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages.

3.3.3 General design guidelines

The identified potential benefits and risks of the anonymity that ICT's afford to participants in policy co-creation practices are summarized below:

1. *Political freedom*
   - \+ Participants are able to contribute inputs to the policy co-creation process without fear of harm.
2. *Epistemic freedom*
   - \+ There is less pressure to conform to status quo views.
3. *Political equality*
   - \+ Citizens with unpopular views are provided a platform to express these views.
   - – Certain views may be disproportionately represented with the creation of "fake" profiles
4. *Epistemic equality*
   - \+ The identity of the contributing citizen does not bias how her views are received by other participants
5. *Quality of outcomes*
   - – There is a lack of accountability for the consequences of the contributions of participants.

Given these potential benefits and risks to the democratic legitimacy of policy co-creation practices, how should ICT's which enable this anonymity in policy co-creation be designed? I argue that a minimal amount of personal information should be collected to ensure an adequate level of anonymity that encourages citizens to participate in the policy co-creation process, but this minimal amount of personal information should also be enough to encourage them to pay attention to the quality of their inputs.

Anonymity has the potential to lead to an improvement in terms of promoting the democratic values, but also the potential to lead to worse outcomes (see, for example, Towne and Herbsleb 2012). A way to deal with this is the following: Collect enough personal information from participants such that there is enough anonymity to encourage the potential benefits to *political freedom*, *epistemic freedom*, *political equality*, and

epistemic equality. At the same time, this amount of information should be enough to also encourage participants to think carefully about the quality of their contributions as there may be consequences for contributions of poor quality. This could then improve the *quality of the outcomes* of the policy co-creation process.

An example of how this might work can be illustrated with the Sapelli platform (Sapelli 2017). The reporting activities of locals on wildlife crime can be made anonymous in the sense that the data collected is not linked to any personal data of the person who made the reports, but is linked to a certain device. The public sector professionals thus do not know who the source of any particular report is just by looking at the data. However, the locals themselves could be asked to maintain a record of who uses which device at any particular time. In this way, if a discrepancy is noticed, then there is an indirect way of tracing who the source of that discrepancy is.

Citizens need not worry about their input being judged based on their personal identities, but they are also made aware that if they give a faulty report that it can be traced back to them. There is a risk that this minimal information may be enough for retributive action to be done against the citizen and for this to deter citizens from providing input into the policy co-creation process, but measures can be put in place for this risk to be minimized. For instance, requiring those who access the information to give their own personal details would also entail some level of accountability on the part of people who want to reveal the information of the citizen providing the input. This can also provide enough deterrence to those who might seek to punish citizens who provide information to the policy process that harms them.

Thus, collecting a minimal but adequate amount of information such that (i) more citizens are encouraged to participate in policy co-creation, and (ii) citizens are also encouraged to pay attention to the quality of their contributions can maximize the potential benefits and minimize the potential risks that the increased anonymity that ICT's afford in policy co-creation may have on the democratic legitimacy of these practices.

3.4 Virtual interactions

The third channel of influence that the digital layer has on policy co-creation practices is by enabling *virtual interactions* between participants, in contrast to more traditional face-to-face ones.

As with the previous sections, I will first discuss how ICT's enable virtual interactions in policy co-creation practices, and then discuss (i) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the four democratic values of political freedom, epistemic freedom, political equality, and epistemic equality (Section 3.4.1), (ii) the potential benefits and risks that ICT's have on the democratic legitimacy of policy co-creation in terms of how their influence on access affects the quality of the outcomes in the policy formulation, policy implementation, and policy evaluation stages (Section 3.4.2), and (iii) the general design guidelines that can be drawn from the analyses in (i) and (ii) (Section 3.4.3).

Traditional deliberative processes involve face-to-face communication where partici-

pants would have to speak publicly to contribute their input. With ICT-enabled policy co-creation, interactions can happen virtually through videoconferencing or online messaging platforms (Aichholzer and Rose 2020, 106–107). The European Commission's Citizens' Dialogues, for example, allows people to livestream the session without sharing video and to submit their questions through Twitter (European Commission 2019).

3.4.1 Potential benefits and risks of virtual interactions on democratic values

So far, I have shown how e-consultations have enabled virtual interaction between participants in policy co-creation practices, in contrast to the face-to-face interactions in traditional practices. How does the virtual nature of interactions in e-consultations affect the democratic legitimacy of policy co-creation practices? I will again begin by discussing the potential benefits and risks in terms of the four democratic values of *political freedom*, *epistemic freedom*, *political equality*, and *epistemic equality*.

The virtual nature of interactions promotes *political freedom* insofar as citizens are given the effective opportunity to participate in the deliberative process. In traditional deliberative processes, only a limited number of views could be publicly expressed due to time limitations. ICT's enable much more information to be transmitted in the same amount of time, which means that more citizens get to provide their inputs into the decision-making process. For example, in a traditional town hall meeting lasting two hours, ten people might be given the opportunity to publicly express their beliefs about an issue. With an ICT-enabled deliberation process such as the European Commission's Citizens' Dialogues, the inputs provided through e-mail, social media, or other online means can be exponentially greater.

The virtual nature of interactions promotes *epistemic freedom* insofar as citizens are able to express their beliefs about the issue at hand in the manner that they would like to. The ability to submit questions in a less public way—such as through e-mail, Twitter, or a text entry box—enables citizens who would have been too shy to express their thoughts publicly in traditional deliberative processes to contribute their input. However, the virtual environment is also less conducive to lively and engaging debate than in traditional deliberation practices because of the limitations of videoconferencing and other technologies available. It becomes difficult to coordinate who should speak, in what order, and how people are able to interject to others' statements. For instance, Delborne et al. (2011, 381) find that participants in an online component of a consensus conference were not engaged as they "found themselves feeling frustrated with the relative chaos of the chat interface." This may undermine epistemic freedom as citizens are given less opportunities to express their ideas in the way that they would want to.

The virtual nature of interactions promotes *political equality* insofar as citizens are given an equal say in the decision-making process. As noted earlier, traditional deliberative practices can only accommodate a limited number of views to be expressed within the given time. The views that are able to be expressed in this time tend to be from people who are confident public speakers. As ICT's are able to accommodate more views to be publicly discussed, the opportunity to publicly express one's beliefs is extended to

more citizens and not just to a select few (Leshed 2009; Dahlberg 2001; Witschge 2004).

The virtual nature of interactions promotes *epistemic equality* insofar as citizens are given equal opportunities to publicly state their beliefs and their reasons for them, and to have these beliefs and reasons be heard. With traditional deliberative processes, the people who tend to be heard the most are confident public speakers. ICT's have the potential equalize the playing field for those who are less confident by giving them opportunities to provide their input in less public ways. However, empirical studies show that this is not necessarily the case: There is a "strong concentration of contributions in a small core of very active users", much like what would happen in more traditional face-to-face settings (Albrecht 2006, 9).

Thus, the virtual interactions that ICT's enable in policy co-creation have the following potential benefits and risks in terms of in how far they promote or undermine the four democratic values:

1. *Political freedom*
   - \+ More information from citizens is able to be transmitted in virtual interactions.
2. *Epistemic freedom*
   - \+ There are more ways for citizens to be able to communicate their inputs into the policy co-creation process.
   - – The virtual nature of communication may be less conducive to lively and engaging debate.
3. *Political equality*
   - \+ More perspectives are able to be expressed through virtual interactions.
4. *Epistemic equality*
   - \+ Citizens who are less confident public speakers are given more opportunities to contribute to the policy co-creation process

3.4.2 Potential benefits and risks of virtual interactions on outcomes

What about the effects of virtual interactions on the quality of the *outcomes* of the decision-making process? On the one hand, the quality of the decisions in the policy formulation and policy evaluation stages may be improved by virtue of there being more ideas that are put on the table. As mentioned earlier, traditional deliberative processes can only accommodate a limited amount of citizens' public expressions of their ideas and opinions. ICT-enabled deliberation allows a greater amount of these ideas and opinions to be publicly expressed (7).

On the other hand, there may be less meaningful scrutiny of the ideas that are put on the table, which results in a decline in the quality of the outcomes of the decision-making process. This is an effect of ICT-enabled deliberation not being conducive to lively and engaging debate because of the limitations of video-conferencing and other technologies

used in these processes (see, for instance, Delborne et al. 2011). The amount of attention given to each idea presented virtually is significantly less than would be the case in face-to-face interaction. This is because of the fact that there are too many things going on at the same time (e.g., if 100 tweets come in in the span of a minute).

Thus, the virtual interactions that ICT's enable in policy co-creation practices have the following potential benefits and risks in terms of in how far they improve or deteriorate the quality of the outcomes of these practices:

+ More ideas are able to be put on the table.

– Less attention and scrutiny is given to each view that is contributed.

3.4.3 General design guidelines

The identified potential benefits and risks of the virtual interactions that ICT's enable in e-consultations are summarized below:

1. *Political freedom*
   + More information from citizens is able to be transmitted in virtual interactions.
2. *Epistemic freedom*
   + There are more ways for citizens to be able to communicate their inputs into the policy co-creation process.
   – The virtual nature of communication may be less conducive to lively and engaging debate.
3. *Political equality*
   + More perspectives are able to be expressed through virtual interactions.
4. *Epistemic equality*
   + Citizens who are less confident public speakers are given more opportunities to contribute to the policy co-creation process
5. *Quality of outcomes*
   + More ideas are able to be put on the table.
   – Less attention and scrutiny is given to each view that is contributed.

Given these potential benefits and risks to the democratic legitimacy of policy co-creation practices, how should ICT's which enable virtual interaction among participants be designed? I will argue that using both asynchronous and synchronous communication technologies together is able to maintain the benefits of increased opportunities for participation, encourage lively and engaging debate, and encourage the careful construction of ideas and responses.

Purvanova (2014) proposes that a central explanatory factor that accounts for the success of virtual teams is the use of diverse and asynchronous communication. Asynchronous communication involves interactions where sending a message and receiving a response to this message does not happen in real time. An example of this is e-mail and social media. An e-mail that is sent at 10:00 am on Monday can be read by the recipient at 2:00 pm, and responded to at 11:00 am on Tuesday. This is in contrast with synchronous communication where feedback is immediate, such as with phone calls and videoconferencing. What Purvanova proposes is that asynchronous communication should be used together with synchronous communication. Asynchronous communication enables team members to have ample time and space to process information and thus more adequately respond to it instead of having to come up with an answer on the spot. Synchronous communication, on the other hand, allows for a lively and productive exchange of ideas.

This can be applied to designing e-deliberation processes. Asynchronous communication allows citizens to more carefully construct their ideas and their responses to others' ideas, minimizing the potential risk that virtual interactions bring to the quality of outcomes of e-deliberation processes (Coleman and Moss 2012; Janssen and Kies 2005, 321; Delborne et al. 2011; Strandberg and Berg 2015). It also gives those who are uncomfortable with public speaking to contribute inputs into the decision-making process, maximizing the potential benefits to political freedom, epistemic freedom, political equality, epistemic equality, and the quality of outcomes. Platforms such as online fora and social media are places where such asynchronous communication can take place. Synchronous communication can be designed in such a way that it is easy to facilitate the discussion to enable a lively and engaging debate, minimizing the potential risk to epistemic freedom (Coleman and Moss 2012; Janssen and Kies 2005, 321; Delborne et al. 2011; Strandberg and Berg 2015). More focus and attention is also given to each idea in these methods of communication, minimizing the potential risk to the quality of outcomes.

Thus, using both asynchronous and synchronous communication technologies together can maximize the potential benefits and minimize the potential risks that the virtual interactions that ICT's enable in policy co-creation practices may have on their democratic legitimacy.

3.5 Conclusion

In this chapter, I have discussed how the addition of a digital layer on policy co-creation practices may affect their democratic legitimacy. There are three ways in which this can happen: (1) by changing how citizens *access* the policy co-creation process, (2) by increasing the level of *anonymity* of participants in the policy co-creation process, and (3) by changing the way that participants *interact* with each other in the policy co-creation process.

For each of these three channels of influence, I identified potential benefits and risks that the addition of a digital layer to policy co-creation practices can give rise to (see

Table 3.1).

Based on the identified potential benefits and risks, I then formulated general design guidelines that aim to maximize the former and minimize the latter:

1. Access to the decision-making process
    a) Make both physical and virtual access to the policy co-creation process available.
    b) Collaborate on the design of ICT-enabled policy co-creation practices with groups of citizens whose effective access may be threatened by the use of ICT's.
2. Increased anonymity
    a) Collect a minimal amount of personal information to ensure an adequate level of anonymity that encourages citizens to provide their inputs to the policy co-creation process, but also encourages them to pay attention to the quality of their inputs
3. Virtual interactions
    a) Use asynchronous and synchronous communication technologies together to encourage both careful construction of ideas and responses and lively and engaging debate.

These general design guidelines can then be further refined into design hypotheses by applying them to a specific ICT-enabled policy co-creation practice and varying some parameters in order to determine the optimal design for that specific co-creation practice. For instance, the general design guideline "Make both physical and virtual access to the policy co-creation process available" can be refined into a design hypothesis by (i) applying it specifically to a participatory budget process, (ii) varying how much physical and virtual access is given (e.g., 80% physical and 20% virtual, 50% physical and 50% virtual, and 20% physical and 80% virtual), and (iii) comparing the absolute and relative amounts of participation among different segments of society (i.e., formal and effective access) in these different arrangements to determine the optimal design.

	Access	Anonymity	Virtual interactions
Political freedom	+ More citizens given formal access – Effective access withheld from some groups of citizens	+ Ability to contribute without fear of harm	+ More information can be transmitted
Epistemic freedom	+ More opportunities for first-hand participation – Those without effective access cannot participate	+ Reduces pressure to conform to status quo views	+ More ways to communicate inputs – Less conducive to lively and engaging debate
Political equality	+ Removing logistical constraints on some groups – Adding technological constraints on other groups	+ Provides platform for those with unpopular views – Allows positions to be disproportionately represented with the creation of "fake" profiles	+ More perspectives are able to be expressed
Epistemic equality	+ More groups have opportunities for first-hand participation – Technological constraints disable some groups from first-hand participation	+ Identity of citizen does not bias how input is received	+ Gives opportunity for less confident public speakers to contribute
Quality of outcomes	+ Greater number and variety of inputs with more formal access – Ideas of those without effective access not given attention to	– Lack of accountability	+ More ideas put on table – Less attention and scrutiny given to each view

Table 3.1: Potential benefits and risks of the digital layer on the democratic legitimacy of policy co-creation

4 ICT's creating new practices of policy co-creation

4.1 Introduction

The second level of influence that ICT's have on policy co-creation is the creation of entirely new practices (Lember 2018, 117ff.). Three types of ICT-enabled policy co-creation practices characterize this level of influence, namely: (1) crowdsourcing, (2) simulations and gamifications, and (3) big data collection. As with the discussion in the previous chapter, I will identify the potential benefits and risks of these technologies to the democratic legitimacy of policy co-creation, and formulate design hypotheses that aim to maximize the potential benefits and minimize the potential risks identified.

Crowdsourcing is the process of openly soliciting inputs from citizens in the problem identification and policy formulation stages of the policy process (Janssen and Helbig 2018, S101; Lember 2018, 117). The first part of participatory budgeting—where citizens are able to propose projects to be funded by the city government—is one such crowdsourcing practice. The "Budget Participatif" in Paris, for instance, begins with project proposals being submitted by Parisians through an online platform where the progress of their projects can also be monitored (Cabannes 2017). Another crowdsourcing practice is the hackathon—a "government-sponsored weekend-long prototyping/coding [event] for citizens, often based on government-provided open data" (Lember 2018, 117). An example of this is the EUvsVirus challenge, where over 30,000 people submitted 2,164 projects that aimed to develop innovative solutions for coronavirus-related challenges in the domains of health, business continuity, and education, among others (Pan-European Matchathon 2020). Wikis—documents or publications that are collaboratively edited and managed—are another form of online crowdsourcing (Lember 2018). An implementation of this was the drafting of the Hamburg Transparency Law in 2010 through a wiki, which was then edited by former Supreme Court judge Jürgen Kühling and approved by local parliament in 2012 (Space for Transparency 2012).

Simulations and gamifications involve giving citizens interactive and immersive experiences in order to get their inputs into the decision-making process (Janssen and Helbig 2018, S101; Lember 2018, 117). This can take place in the problem identification, policy formulation, and policy implementation stages of the policy process. An example of the use of simulations in policy co-creation is the Participatory Chinatown project in Boston in the United States (City of Boston 2017). A virtual environment based on the real Chinatown in Boston was created, and community members were asked to take on the role of one of fifteen virtual residents—each of which had her own specific background, set of goals and values, and individual circumstances that affected the tasks she was

taking on. For example, "the character Joe Wong was a father of four who immigrated to Boston from China 15 years ago. He was looking for a new job, but his limited English fluency limits his prospects" (City of Boston 2017). The players were then able to move through the neighborhood and make decisions for their respective characters. These decisions, as well as points raised in post-session discussions, served as input for the master planning process (involving problem identification and policy formulation) in the neighborhood. An example of the use of gamification in policy co-creation is the *Mapatón* project in Mexico city (Téllez 2016). The problem it sought to solve was the lack of an updated map of the approximately 1,500 bus routes in the city. The game was simple: users scored points according to the routes that they travelled, which was recorded via an app that gathered GPS data. The participants with the highest scores could win cash prizes and electronic devices. In a period of two months, 1,763 routes were mapped. Traditionally, this would have taken more than a year to obtain and cost more than double what *Mapatón* did.

Sensor data collection is a new practice of policy co-creation which takes place at all stages of the policy process (Veenstra and Kotterink 2017; Janssen and Helbig 2018; Lember 2018). Data can now be easily gathered through the Internet of Things such as wearable devices (e.g., smartwatches and heart rate monitors), home appliances (e.g., lighting and heating systems), and car systems (e.g., automatic acceleration and braking systems). Social media platforms also provide vast amounts of data that can be used for sentiment analysis. An example of how sensor data can be used for policy co-creation is the creation of mobile applications (apps) for disease outbreak control. In their efforts to contain the spread of the novel Coronavirus, South Korea has developed an app with which incoming travellers are required to report symptoms daily and people's movements are tracked (Lee and Lee 2020). With this data, routes taken by infected patients are reported, and citizens receive location-based emergency messages that alert them when they are near a confirmed case.

These new practices of policy co-creation give rise to new types of input that are collected from citizens for use in the policy process, which were not able to be collected with traditional policy co-creation practices, or even ICT-enabled practices at the first level of influence. These are indirect and passive inputs. Indirect input is collected when citizens are asked a certain question A, from which their response is used to infer what their response to question B would be. To illustrate, an example of this is when citizens are asked to play a virtual simulation game where their decisions within the game (their responses to A) are used to determine which problems they think should be addressed through policy (what their response to B would be). This is in contrast with direct input, where citizens would simply be asked which problems they think should be addressed through policy (i.e., they would be asked question B) directly. Passive input is collected when citizens do not have to perform a separate conscious action to provide input into the decision-making process other than their normal behavior. An example of this would be data collection through wearable devices: citizens do not need to perform a separate action to submit each data point to the policy co-creation process, but simply go about their usual lives wearing the device, which collects and submits the data. I discuss indirect and passive input in further detail in Section 4.2.

The new practices of policy co-creation which use indirect and passive data may affect the four democratic values and the outcomes of the policy co-creation process in a different way than other more traditional ways of collecting citizen input do. In Section 4.3, I identify potential benefits and risks that indirect and passive inputs can give rise to. I do this by examining how collecting these types of inputs can promote or undermine each of the four democratic vales of political freedom, epistemic freedom, political equality, and epistemic equality. For co-creation practices which collect indirect and passive input in the policy formulation, policy implementation, and policy evaluation stages, I also examine how these practices affect the quality of the outcomes that result. In Section 4.4, I discuss how the design of these technologies in terms of the amount of control that citizens have over their inputs can maximize the potential benefits and minimize the potential risks that I identify in Section 4.3.

4.2 Different types of input into the policy co-creation process

In this section, I will discuss the different types of input that the three new practices are able to collect. There are two dimensions to these different types of input.

The first dimension distinguishes between (i) direct and (ii) indirect input. Direct input is collected when citizens provide responses that directly address the question being decided on in the decision-making process. An example of this would be when citizens provide answers to the question "Which problems should be addressed through policy?" in the problem identification stage of the policy process. Indirect input is collected when citizens are asked for their responses to a certain question, which will then be used to infer their inputs into the decision that is actually being made. An example of this is when citizens are asked to play a virtual simulation game where their decisions within the game are used to determine which problems they think should be addressed through policy.

The second dimension distinguishes between (i) active and (ii) passive input. Active input is collected when citizens provide their input as a conscious action for the purpose of contributing to the decision-making process. An example of this is when citizens submit proposals for a specific project in crowdsourcing practices. Passive input is collected when citizens do not have to perform a conscious and willed action to provide input into the decision-making process. Data collection through wearable devices is an example of this: citizens do not have to perform a separate conscious action to provide their input into decision-making processes apart from wearing the device and enabling this data to be used by certain parties.

ICT's that simply add a digital layer on traditional policy co-creation practices collect *direct* and *active* input from citizens. Their input is *direct* in that they are aware what question or decision their inputs into the policy co-creation process are being used for, and their inputs are direct responses to this question or decision. An example would be an e-survey which asked citizens about their opinions on an implemented policy: citizens know that their responses will be used for evaluating the said policy, and are asked directly about what they think of the policy. Their input is *active* in that their

providing of their input into the policy co-creation process is a conscious action with the intention of providing input into the policy co-creation process. Going back to the e-survey example, in providing responses to the survey, citizens are consciously performing an action which is intended to contribute to the policy co-creation process at the policy evaluation stage.

The same is true for crowdsourcing practices. Input is *direct* in that they are providing direct responses to the questions of "What problems should be addressed through policy?" and "What is the most effective policy in order to best address the problem(s) identified in the first stage?" in the problem identification and policy formulation stages, respectively. Input is *active* in that their submission of their proposals is a conscious action performed for the purpose of contributing to the policy co-creation process at the problem identification and policy formulation stages.

Simulations provide *indirect* input in that the responses that citizens provide to the decision-making process are not direct answers to the questions being decided on. For example, in the Participatory Chinatown project, citizens' decisions within the game were what citizens provided as inputs into the problem identification and policy formulation stages of the policy process (City of Boston 2017). The decisions made within the game, however, do not directly answer the questions, "What is the most effective policy in order to best address the problem(s) identified in the first stage?" Citizens' answers to these questions were *inferred* from the decisions they made in the simulation. Citizens' input collected through simulations is *active* in that their participating in the simulation is a conscious action performed for the purpose of contributing to the policy co-creation process at the problem identification and policy formulation stages.

Some gamification practices may involve *direct* input, while others involve *indirect* input. Take, for example, the *Mapáton* project: Some citizens may be providing responses to the question of "What are the bus routes that have to be mapped?", while other citizens may be providing responses to the question of "What actions do I need to perform to be able to win the game?" Inputs which answer the former question are direct inputs, while inputs which answer the latter question are indirect inputs. It is important to note that a citizen participating in the gamification practice may actually be answering both questions at the same time. However, their answering the former question makes their input direct.

Gamification processes may also involve both *active* and *passive* inputs from citizens. Taking the Mapáton example again, some citizens may be using the platform with the intention of contributing to the mapping of the bus system in Mexico city, but others may be using the platform in order to collect points to win prizes. The former are contributing active inputs into the policy co-creation process, while the latter are contributing passive inputs. Again, a citizen participating in the gamification practice may actually be participating in the policy co-creation practice with both intentions. In these situations, the presence of the first intention makes their inputs active.

Sensor data collection involves both *indirect* and *passive* input. Citizens may choose to make their health data from their Fitbit smartwatches publicly available, which means that this can be used to contribute to the problem identification ("What health problems should we address?") and policy evaluation ("What are the effects of the implemented

health policy?") stages of the policy process. The data that citizens provide are not direct answers to the questions of "What health problems should we address?" and "What are the effects of the implemented health policy?", but are used in order to infer the answers to these questions by aggregating and performing analyses of this data. Furthermore, when citizens' data from their devices are used as inputs in the policy co-creation process, they do not need to perform a separate action to contribute their input. They simply need to use the device as they normally would, and data generated from use is automatically transmitted as input into the decision-making process.[1]

Table 4.1 provides a summary of the different practices and the types of inputs collected from them.

	Direct/Indirect	Active/Passive
E-consultations, e-voting and e-surveys, platforms	Direct	Active
Crowdsourcing	Direct	Active
Simulations	Indirect	Active
Gamifications	Direct/Indirect	Active/Passive
Sensor data collection	Indirect	Passive

Table 4.1: ICT-enabled policy co-creation practices and the types of input collected

I argue that policy co-creation practices which collect indirect and passive input may have different effects on democratic legitimacy than their counterparts with direct and active inputs. One possible issue may be that with indirect input—which infers a participant's response to a certain question A from her response to a different question B—the wrong response to question A may be inferred. Take, for example, a citizen who is participating in a simulated game where her decisions in the game (response to question B) are used to infer what issues she thinks are important in the community (response to question A). Based on her decisions in the game, it may be inferred that the issue she thinks is most important in the community is crime. However, if asked directly, she may instead say that poverty is the issue that she deems most important. This possible discrepancy is a risk to democratic legitimacy in that the co-creation process may actually be collecting falsely attributed preferences or beliefs for use in the policy process. However, the collection of indirect input may also hold promise in that it allows for more objective answers to be collected from citizens by filtering out biased or strategic behavior. Using the previous example, a citizen with a vested interest in infrastructure in the community may point to it being an important issue in order to get some financial gain. Collecting input indirectly avoids such conflicts of interest from being exploited.

Another issue is that with passive input, the citizen may not be aware that her activities or behavior are being used as inputs into the policy co-creation process. This may mean that she would have acted differently had she known that her actions were

1. Of course, they would need to consent to providing their data to third-parties before any of this is transmitted. However, after giving this consent the first time, no additional action is needed to submit each data point as input.

being used to create, implement, or evaluate policy. An example would be a gamification where the goal of the activity to collect information from citizens for policy co-creation is not made known to participants. They might act in such a way as to simply win the game, without knowing that their decisions and actions will actually be used in the policy process. Had they known, they would have been more thoughtful about their decisions. This may risk democratic legitimacy in that there is a sense that citizens are not being fully informed of the circumstances in which they are acting, and they might have acted differently if they were fully informed. However, there is again a benefit from using such 'natural' behavior as inputs for the policy process rather than behavior that might be influenced by strategic concerns.

Given that there are unique concerns on the democratic legitimacy of policy co-creation practices which collect indirect and passive inputs as opposed to those which collect direct and active inputs, additional analysis should be done as to the potential benefits and risks to the four democratic values and to the outcome of the policy co-creation process unique to such practices.

4.3 Indirect and passive input and democratic legitimacy

In this section, I will identify the potential benefits and risks of ICT's which enable indirect and passive input on the democratic legitimacy of policy co-creation practices. I will first (i) identify these potential benefits and risks in terms of in how far the four democratic values of political freedom, epistemic freedom, political equality, and epistemic equality are promoted or undermined (Section 4.3.1). I then (ii) identify potential benefits and risks in terms of in how far the quality of the outcomes of the policy co-creation processes in the policy formulation, policy implementation, and policy evaluation stages is improved or deteriorated (Section 4.3.2).

4.3.1 Potential benefits and risks of indirect and passive input on democratic values

Political freedom is promoted insofar as citizens are given the effective opportunity to participate in decision-making processes. Indirect input may promote political freedom in that the questions or tasks posed to citizens in order to contribute to the decision-making process are much easier than if they were required to give direct input. For instance, the task given in a simulation activity may be easier to perform than the task of evaluating different policy proposals. With passive data, even less effort is required on the part of the citizen to be able to contribute to the data collection process. For instance, sensor data collection entails no extra effort on the part of citizens to contribute to the decision-making process.

Epistemic freedom is promoted insofar as citizens are able to express their beliefs in the way that they see fit. Indirect and passive input may undermine epistemic freedom in that citizens do not get to choose how they are able to express their beliefs to contribute to the decision-making process. They may not even know that they are contributing to the decision-making process because the 'real' question is not revealed to them (or, with

passive data, they may not know they are contributing to a decision-making process at all). Furthermore, the answer to the 'real' question that is inferred from the indirect and passive input may actually be different from the one that the citizen would have given if asked directly. There is also the consideration of being nudged by gamification practices: the framing of the decision-making process is changed in order to get citizens to contribute more to it. This can be seen as manipulative behavior which undermines epistemic freedom.

Political equality is promoted insofar as citizens have an equal say in the decision-making process. The lowering of the barrier of how much time and effort it takes to contribute indirect and passive input promotes political equality. Those who would not have had the time, energy, or perceived expertise to contribute direct or active input are now given this opportunity to have an equal say as those who do. For instance, the amount of effort required to contribute one's health data collected through wearables (i.e., passive input) to the policy co-creation process is significantly less than it would take to recruit citizens to physically show up to have this data be collected (i.e., active input). Contributing indirect input may also require less effort than direct input on the part of citizens in that the questions or tasks given to them require less cognitive effort. For instance, instead of asking citizens to think about what issues they think are most important to address in the community (i.e., direct input), they may simply provide their inputs to this question through playing a simulated game (i.e., indirect input).

Epistemic equality is promoted insofar as citizens have equal opportunities to publicly state their beliefs and their reasons for them, and to have these beliefs and reasons be heard. This may be compromised by using indirect input in the policy co-creation process because those who are in charge of interpreting citizens' indirect and passive inputs into answers to the 'real' questions being tackled in the policy co-creation process are given more authority in the decision-making process than the citizens who provide the indirect input. Citizens are given less opportunity to express their beliefs and have these be heard than the people who are able to provide their input however they see fit. For instance, citizens who are asked directly what issues they want addressed in the community can provide their answers in the way that they would like, while those who are asked indirectly through simulations do not get to state their beliefs in the way that they would like.

4.3.2 Potential benefits and risks of indirect and passive input on outcomes

In addition to the four criteria discussed in the previous subsection, the outcomes of the policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages should also be evaluated in terms of: *how effective the policy is at addressing the problems that it aims to solve* (policy formulation), *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved* (policy implementation), and *the accuracy of the judgment of whether the implemented policy was a success or a failure* (policy evaluation).

Indirect and passive input can increase the quality of the outcome of the decision-making process by enabling a more 'objective' framing of the question that needs an-

swering. For example, in the policy evaluation stage of the policy process, citizens can be asked directly whether they thought that a certain implemented policy was a success or a failure. It could be the case that while a health policy contributed to better health outcomes, some citizens were disadvantaged financially. Some citizens may feel the financial disadvantage more saliently than the health benefits, so when asked directly about their opinion, they would call the policy a failure. However, when indirect input is collected in the form of health and financial data, the policy may objectively be considered a success by referring directly to improvements in life expectancy, mortality and morbidity rates from chronic diseases, and the cost-effectiveness of the intervention. Moreover, when passive input is collected, citizens have less opportunity to act strategically in order to provide input which is skewed towards furthering their particular interests. This more objective assessment can contribute to better outcomes of the decision-making process because certain biases are averted.

The identified potential benefits and risks to the four democratic values and to the outcomes of policy co-creation apply specifically ICT-enabled policy co-creation practices which collect indirect and passive data (see Table 4.2). Thus, additional design hypotheses for these technologies should also be formulated in addition to the ones given in the previous chapter. In the next section, I discuss the design issue of how much control citizens should be given over how their inputs to the policy co-creation process are used, given the potential benefits and risks identified in this section.

4.4 Citizen control over indirect and passive input: General design guidelines

In the previous section, I argued that while the collection of indirect and passive input can potentially improve the quality of the outcomes of the decision-making process and also promote some democratic values, it also carries risks in terms of undermining epistemic freedom and equality. Enhancing citizen control over indirect and passive inputs would minimize the risk of undermining epistemic freedom and equality, but it also compromises the beneficial effects on the quality of the outcomes.

There are three levels of control that citizens can have over indirect and passive inputs: (i) increased transparency, (ii) the opportunity to opt out of the decision-making process, and (iii) the ability to challenge how the inputs are used.

Transparency involves informing citizens of (a) who makes decisions with their input, (b) what decisions are being made with their input, and (c) how their input is being used to make those decisions. Citizens are able to gain more epistemic freedom through knowing whether the translation of their input is in line with their beliefs and ideas. They also gain epistemic equality by removing some of the power that translators of their inputs have over what their contribution to the decision-making process will be. Some of the benefits to the quality of the outcomes may be lost by enabling citizens to act strategically in the decision-making process as they learn about how their inputs are translated. This makes their contribution less objective.

A higher level of control that citizens may have is the *opportunity to opt out of the*

	+	–
Political freedom	Indirect and passive inputs make it easier to contribute to policy co-creation	
Epistemic freedom		Citizens do not get to choose how they express their beliefs to contribute to the policy co-creation process
Political equality	Indirect input lowers barriers to participating in policy co-creation (e.g., time, energy, expertise)	
Epistemic equality		Those in charge of interpreting indirect input given more authority in the policy co-creation process
Quality of outcomes	More objective framing of issue at hand; less opportunity for strategic behavior	

Table 4.2: Potential benefits and risks of collection of indirect and passive input for policy co-creation on democratic legitimacy

decision-making process. If they do not agree with how their inputs are being used in the decision-making process, an opt-out would enable them to prevent these from being used. Even more epistemic freedom and equality is able to be regained. However, the decline in the quality of the outcomes also grows. Selection bias becomes a problem in that only the perspectives of those who agree with how their inputs are used are included in the decision-making process, which may distort the result in a particular direction.

The highest level of control that citizens are able to have over indirect and passive input is the *ability to challenge how their inputs are used*. Not only are citizens able to know how their inputs are used and to withdraw these from the decision-making process, but they can also ask for these to be translated the way that they would like it to be translated. For instance, in a policy co-creation practice using a simulated game where participants' decisions are being used to infer what issues they think are most important to address in the community, the participants can ask how their decisions in the game are being translated into the issues which are inferred to be the most important to address for them. Moreover, they would get to override the translation if they feel that this is not an accurate depiction of their views. If the results of the simulated game are that

they care most about crime but the citizen feels that they are more concerned about employment opportunities, then they are able to change these results. This restores most of the epistemic freedom and equality that would have been lost without any level of control over indirect and passive input. However, this also removes most of the benefits of these types of input to the quality of the outcomes of the decision-making process by accommodating biased and strategic behavior.

Which level of control is appropriate to give to citizens when indirect and passive input is collected from them in policy co-creation practices? How should epistemic freedom and equality be balanced against the quality of the outcomes of the decision-making processes? The European Union's (EU) General Data Protection Regulation (GDPR) offers some guidance in navigating this trade-off (Voigt and Von dem Bussche 2017). The GDPR states that organizations that process people's data have to provide those people with clear information on (among others):

- with whom the data will be shared
- for what purposes the data will be used
- the legal basis for processing the data
- how to withdraw consent given to process the data

I argue that a similar principle can apply to the design of policy co-creation practices which involve the collection of indirect and passive input. At the very least, citizens should know that their inputs are being used in policy co-creation practices and by whom. This does not mean, however, that they need to know how their inputs are being translated in the decision-making process. Knowing this could enable strategic behavior that distorts the quality of the outcomes of the process.

This then informs the first general design guideline for ICT-enabled policy co-creation practices which collect indirect and passive inputs:

> Citizens should be made aware that their inputs are being used for policy co-creation practices, and who are using these inputs.

Another important aspect of the GDPR is that the right to object (e.g., to opt out) against a particular use of one's data can be overridden when (among others):

- processing is necessary in order to protect the *vital interests* of the data subject or of another natural person
- processing is necessary for the performance of a task carried out in the *public interest*

Applied to ICT-enabled policy co-creation practices, this would mean that citizens should generally be able to opt out and object to how their inputs are used, except under certain circumstances such as the 'vital and public interests' conditions as specified in the

GDPR. An example of a circumstance in which prohibiting opt-outs would be justifiable is the collection of data for disease outbreak control. Ensuring the quality of the outcomes of the policy co-creation process in that case is vital to protect the public interest. The negative effect on epistemic freedom and equality in these cases is justified.

This then informs the second general design guideline for ICT-enabled policy co-creation practices which collect indirect and passive inputs:

> Citizens should generally be able to opt out and object to how their inputs are being used in policy co-creation processes, unless circumstances of vital and public interests justify withholding this ability to opt out.

A possible objection to this second design hypothesis would be to insist on an opt-in condition instead of an opt-out condition. In other words, citizens should be informed and agree to how their inputs are will be used in the policy co-creation process. This would amount to giving citizens full control of their inputs. This may remove most of the risk to their epistemic freedom and equality, but it may also eliminate all the potential gains in terms of ensuring the objectivity and quality of the outcomes of the policy co-creation practice (Lai and Hui 2006). The second level of control—providing the opportunity to opt out—may be a better way to balance the potential gains and losses against each other.

Thus, I argue that the following general design guidelines would maximize the potential benefits and minimize the potential risks that collecting indirect and passive inputs may have on the democratic legitimacy of the policy co-creation process:

1. Citizens should be made aware that their inputs are being used for policy co-creation practices, and who are using these inputs.
2. Citizens should generally be able to opt out and object to how their inputs are being used in policy co-creation processes, unless circumstances of vital and public interests justify withholding this ability to opt out.

4.5 Conclusion

In this chapter, I have discussed how technologies which create new practices of policy co-creation enable the collection of new types of input, which has implications on the democratic legitimacy of these practices. Indirect and passive inputs present a potential risk to epistemic freedom and equality, but also have great potential benefit to political freedom, political equality, and the quality of the outcomes of the policy co-creation process (see Table 4.1). The level of control that citizens have over these indirect and passive inputs are able to minimize these potential risks to epistemic freedom and equality, but also lower the potential increase in quality of the outcomes of the decision-making process. How should these two considerations be balanced against each other?

Taking inspiration from the EU's GDPR, I formulated two general design guidelines for ICT-enabled policy co-creation practices which collect indirect and passive inputs:

1. Citizens should be made aware that their inputs are being used for policy co-creation practices, and who are using these inputs.

2. Citizens should generally be able to opt out and object to how their inputs are being used in policy co-creation processes, unless circumstances of vital and public interests justify withholding this ability to opt out.

These general design guidelines can then be further refined into design hypotheses by applying them to a specific ICT-enabled policy co-creation practice and varying some parameters in order to determine the optimal design for that specific co-creation practice. For instance, the general design guideline about opting out can be refined into a design hypothesis by (i) applying it specifically to a simulated game co-creation process, (ii) varying how much opportunity for objecting to how input is used is given to participants (e.g., no opportunities to object, limited opportunities to object, unlimited opportunities to object), and (iii) comparing whether there are significant differences in the three different arrangements in terms of the outcomes of the process. These differences may mean that participants are able to behave strategically or in a biased manner, compromising the quality of the outcomes. The optimal design for specific ICT-enabled policy co-creation practices which collect indirect and passive inputs can then be determined by finding the right level of citizen control over these inputs with these design hypotheses.

5 Conclusion

Policy co-creation involves "the joint effort of citizens and public sector professionals in the initiation, planning, design, and implementation of public services" (Brandsen, Steen, and Verschuere 2018, 3). Policy co-creation can happen in one or more of the stages of the policy cycle: (i) problem identification, (ii) policy formulation, (iii) policy implementation, and (iv) policy evaluation. Information and communication technologies (ICT's) have influenced these policy co-creation practices on two levels (Lember 2018): The first and most basic level of influence is the addition of a digital layer on top of the traditional policy co-creation practice. The second level of influence would be the creation of entirely new practices of policy co-creation, such as crowdsourcing, simulations and gamifications, and big data collection.

In this thesis, I addressed the following research question: How does the use of ICT's in policy co-creation practices affect their democratic legitimacy? More specifically:

1. I formulated a conceptual framework to evaluate the democratic legitimacy of policy co-creation practices,

2. I applied the framework to identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices, and

3. I came up with general design guidelines for ICT-enabled policy co-creation practices which aim to maximize the identified potential benefits and minimize the identified potential risks.

In Chapter 2, I formulated a framework to evaluate the democratic legitimacy of policy co-creation practices by (i) identifying the conceptions of democratic legitimacy that are appropriate to use for evaluating policy co-creation practices, and (ii) formalizing these appropriate conceptions into criteria for evaluating the democratic legitimacy of policy co-creation practices.

First, I argued that the two conceptions of democratic legitimacy that are appropriate to use for evaluating policy co-creation practices are the pure procedural epistemic and mixed epistemic conceptions. The pure procedural epistemic conception takes into account (1) in how far policy co-creation practices promote values that are intrinsic to democracy and (2) in how far it is able to generate knowledge based on the information gathered from citizens. The mixed epistemic conception also takes (1) and (2) into account, and in addition, also takes the quality of the outcomes of the policy co-creation process into account in evaluating its democratic legitimacy.

Second, I delineated that the pure procedural epistemic conception should be used for evaluating the democratic legitimacy of policy co-creation practices in the problem

identification stage, and that the mixed epistemic conception should be used for the policy formulation, policy implementation, and policy evaluation stages. When there is a legitimate epistemic authority on the issue being decided on, then that authority can set a justifiable standard with which to measure the quality of the outcome of the decision-making process. The mixed epistemic conception—which takes the quality of the outcomes into account, in addition to the quality of the procedure—should be used in these cases. When such a legitimate epistemic authority does not exist on the issue being decided on, then there is no justifiable standard with which to measure the quality of the outcome of the decision-making process. The pure procedural epistemic conception—which does not take the quality of the outcomes into account—should be used in these cases. In the problem identification stage, there is no legitimate epistemic authority on which societal problems should be given priority in the policy process. Thus, the pure procedural epistemic conception should be used in evaluating the democratic legitimacy of policy co-creation at this stage. In the policy formulation, policy implementation, and policy evaluation stages, there are legitimate epistemic authorities on how policy should be designed in order to achieve its goals, on how policy should be implemented in order to ensure that it is effective, and on how to evaluate policies. Thus, the mixed epistemic conception should be used in evaluating the democratic legitimacy of policy co-creation at these stages.

Finally, I formalized the framework into a set of criteria for evaluating policy co-creation practices at each of the four stages of the policy process. Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy take into account in how far policy co-creation practices promote certain values which are intrinsic to democracy—that is, values that make democratic decision-making morally desirable independent of their consequences (Christiano 2018). The two most common intrinsic values attributed to democracy are freedom as self-determination and equality of advancement of interests (Christiano 2018).

Both the pure procedural epistemic and mixed epistemic conceptions of democratic legitimacy also take into account in how far policy co-creation practices are able to generate knowledge based on the information gathered from citizens. Peter (2007, 348) argues that with epistemic accounts of democratic legitimacy, in addition to taking account of in how far the *political* values of freedom and equality are promoted, taking account of in how far the *epistemic* values of freedom and equality are promoted should also be done.

These four values of political freedom, political equality, epistemic freedom, and epistemic equality can then serve as criteria for evaluating the democratic legitimacy of policy co-creation practices in all stages of the policy process:

1. *Political freedom*: citizens are given the effective opportunity to participate in policy co-creation practices whose outcomes will have an impact on their lives.

2. *Political equality*: citizens are given equal opportunities to influence the outcomes of the policy co-creation process.

3. *Epistemic freedom*: citizens are given the opportunity to form their own beliefs

about an issue and express these beliefs in the way that they see fit.

4. *Epistemic equality*: citizens have equal opportunities to state their beliefs and their reasons for them, and to have these beliefs and reasons be heard.

For policy co-creation practices in the policy formulation, policy implementation, and policy evaluation stages of the policy process, the outcomes of the co-creation process should also be evaluated. The quality of the outcomes of policy co-creation practices at the policy formulation stage are assessed in terms of *how effective the policy is at addressing the problems that it aims to solve*. The quality of the outcomes of policy co-creation practices at the policy implementation stage are assessed in terms of *how effective policy monitoring and enforcement is at ensuring that the goals of policy are achieved*. The quality of the outcomes of policy co-creation practices at the policy evaluation stage are assessed in terms of *the accuracy of the judgment of whether the implemented policy was a success or a failure*.

A summary of the criteria for evaluating the democratic legitimacy of policy co-creation practices at each stage of the policy process can be found in Table 2.3.

In Chapters 3 and 4, I used this framework to identify the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation based on how it may promote or undermine the four democratic values (political freedom, epistemic freedom, political equality, and epistemic equality), and how it may improve or deteriorate the quality of the resulting policy (for co-creation at the policy formulation, policy implementation, and policy evaluation stages). I then came up with general design guidelines that aim to maximize the potential benefits and minimize the potential risks identified.

In Chapter 3, I focused on the first and most basic level of influence that ICT's have on policy co-creation practices: the addition of a digital layer. There are three ways in which the digital layer can affect the democratic legitimacy of policy co-creation: (1) by changing how citizens *access* the policy co-creation process, (2) by increasing the level of *anonymity* of participants in the policy co-creation process, and (3) by enabling *virtual interactions* among participants in the policy co-creation process. For each of these three channels of influence, I identified potential benefits and risks that the addition of a digital layer to policy co-creation practices can give rise to (see Table 3.1).

Based on these identified potential benefits and risks of the addition of a digital layer on policy co-creation practices, I formulated the following general design guidelines to maximize the potential benefits and minimize the potential risks:

1. Access to the decision-making process
    a) Make both physical and virtual access to the policy co-creation process available.
    b) Collaborate on the design of ICT-enabled policy co-creation practices with groups of citizens whose effective access may be threatened by the use of ICT's.
2. Increased anonymity

   a) Collect a minimal amount of personal information to ensure an adequate level of anonymity that encourages citizens to provide their inputs to the policy co-creation process, but also encourages them to pay attention to the quality of their inputs

3. Virtual interactions
   a) Use asynchronous and synchronous communication technologies together to encourage both careful construction of ideas and responses and lively and engaging debate.

In Chapter 4, I focused on the second level of influence of ICT's on policy co-creation: the creation of new practices of policy co-creation. More specifically, these technologies are able to collect indirect and passive inputs from citizens, which have potential benefits and risks to democratic legitimacy that differ from the more traditional co-creation practices which collect direct and active inputs. I identified these potential benefits and risks which apply specifically to ICT-enabled policy co-creation that collects indirect and passive inputs from citizens (see Table 4.2).

Based on the identified potential benefits and risks, I formulated the following general design guidelines for ICT-enabled policy co-creation practices which collect indirect and passive inputs from citizens to maximize the potential benefits and minimize the potential risks:

1. Citizens should be made aware that their inputs are being used for policy co-creation practices, and who are using these inputs.

2. Citizens should generally be able to opt out and object to how their inputs are being used in policy co-creation processes, unless circumstances of vital and public interests justify withholding this ability to opt out.

The general design guidelines formulated in both Chapters 3 and 4 can then be further refined into design hypotheses by applying them to a specific ICT-enabled policy co-creation practice and varying some parameters in order to determine the optimal design for that specific co-creation practice. Recalling an example given in Chapter 3, the general design guideline "Make both physical and virtual access to the policy co-creation process available" can be refined into a design hypothesis by (i) applying it specifically to a participatory budget process, (ii) varying how much physical and virtual access is given (e.g., 80% physical and 20% virtual, 50% physical and 50% virtual, and 20% physical and 80% virtual), and (iii) comparing the absolute and relative amounts of participation among different segments of society (i.e., formal and effective access) in these different arrangements to determine the optimal design which promotes the democratic legitimacy of the co-creation process.

5.1 Addressing a possible objection

An objection that can be raised against the analysis that I have provided in my thesis is that it included speculative arguments—some with little empirical foundation. My

first response to this would be that the goal of my thesis is to identify *potential* benefits and risks to democratic legitimacy, and not to argue that these are based on irrefutable empirical evidence. Some of the identified potential benefits and risks have been observed empirically in case studies (e.g., Meijer 2011; Clark, Brudney, and Jang 2013; Townsend 2013; Mergel 2012; Kornberger et al. 2017), but it is difficult to generalize these findings to be true for all ICT-enabled co-creation practices. Moreover, no systematic empirical studies of ICT-enabled co-creation which collects indirect and passive inputs has been done.

A second response to the objection that my analysis has been speculative is that since the extent to which the identified potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation practices are present in actual cases may vary, the effectiveness of the general design guidelines in maximizing these potential benefits and minimizing these potential risks may vary as well. The general design guidelines are *general* in that they are meant to be refined into design hypotheses by applying them to a specific ICT-enabled policy co-creation practice and varying some parameters in order to determine the optimal design for that specific co-creation practice, as I have illustrated throughout the thesis.

Thus, future empirical work may either lend credence to or disprove the findings that I have presented in this thesis: the potential benefits and risks of ICT's to the democratic legitimacy of policy co-creation, and the general design guidelines which aim to maximize these potential benefits and minimize these potential risks. The most important contribution of my thesis lies in the creation of a conceptual foundation with which to frame these empirical findings in order to contribute to the design of more democratically legitimate ICT-enabled policy co-creation practices.

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