

Parallel and Sequential Learning Loops in the Policy Process

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Abstract

This chapter advances the literature on policy learning by conceptualizing the policy process as involving two distinct but potentially un-related learning loops: policy-oriented learning, focused on technical effectiveness and problem-solving, and power-oriented learning, centered on political feasibility and strategy. Drawing from the notion of loop-level parallelism in computer science, the authors argue that these learning loops may either occur in parallel—maximizing both effectiveness and legitimacy—or sequentially, often leading to policy failure due to misalignment between technical and political dimensions. The chapter provides a theoretical framework for understanding how learning loops interact in public policy, explores the implications of their sequencing for policy outcomes, and emphasizes the central role of temporality and failure in shaping policy change.

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1. Introduction

In this chapter, we contribute to the literature on policy learning by conceiving learning in public policy as a double loop process. Existing scholarship on learning in public policy and public administration has focused extensively on the conceptualization of forms, modes, and results of individual and collective learning (Dunlop and Radaelli 2018; Dunlop, Radaelli, and Trein 2018). Whilst the conceptual breadth of the field offers many different avenues for researchers, it is also a “conceptual minefield” that scholars need to navigate (Levy 1994, as mentioned in Zaki, Weyenberg, and George 2022, 4).

A common definition of policy learning refers to it as the acquisition of new information that permits the updating of beliefs about the effects of a new policy (Braun and Gilardi 2006, 308). In addition, another definition of learning points out that policy learning is a, “1) a collective process, which may include acquiring information through diverse actions (e.g. trial and error), assessing or translating information, and disseminating knowledge or opportunities across individuals in a collective, and 2) collective products that emerge from the process, such as new shared ideas, strategies, rules, or policies” (Heikkila and Gerlak 2013, 486).

In recent research on policy learning, scholars have underlined the importance of linking aspects of policy learning that are related to problem-solving and puzzling on the one hand, to learning related to powering and office-seeking on the other. In other words, an important problem is how to transfer learning into policy change that improves existing public policies while at the same time being politically acceptable (Dunlop et al. 2024; Trein and Vagionaki 2022). This aspect is important because it underlines that the lessons of learning can lead to policy failure and even the destruction of public value (Dunlop 2017; Trein and Vagionaki 2024; Zaki 2024a).

We argue that to understand the connection of puzzling and powering, or in other words, policy-oriented and power-oriented learning, it is necessary to analyze learning in public policy as the presence or absence of learning as a parallel-loop process. The notion of a parallel loop is borrowed from computer science as well as psychology, where programs execute tasks in parallel but separated from each other (H. A. Simon 1967, 1993). We hold that learning in the public policy process resembles a parallel loop. The first loop is about learning what works as a policy notably on how to transfer insights and experiences into improved policy instruments and practice (policy instrument-oriented learning). The second loop is about what is acceptable as a policy and receives political support (power-oriented learning). In an ideal world, both loops would happen in parallel and provide feedback to each other, to achieve an optimal transfer of learning into policy change.

In order for parallel learning to succeed, there needs to be linkages between the processes, however, the capacity is limited for parallel learning and information processing at the top-level of political and administrative organizations (H. Simon 1997, 241). Therefore, learning is likely to occur in a serial fashion, according to which policy- and power-oriented learning follow each other sequentially. In this case, policy- and power-oriented learning are interrupted through failure (McConnell 2015). Such failure can be either programmatic failure, in cases where learning at the beginning of the sequence is only about power and political acceptability. Alternatively, the learning sequence may be interrupted by political failure, if the onset of the sequence is only about policy-oriented learning and ignores political acceptability. The main point is that if learning occurs in a sequential fashion, there is likely to be an instance of failure that is involved in the learning process.

The chapter is structured as follows: the subsequent section explores how policy-oriented and power-oriented learning have been dealt within the relevant literature as well as how we distinguish them from what has been done up to now. We then continue by presenting how parallel loops are linked with policy learning and policy innovation. After that we discuss the divergent implications for policy research, particularly with respect to (de)politicization, agency, and crises. We conclude by discussing the contribution of our analysis to the policy learning literature overall.

2. Power and problems: two processes of learning in public policy

At the outset, we distinguish two different learning processes. The first one entails learning about problem solving, and the latter refers to learning intended to improve political influence, potentially even without regarding any problem-solving contribution of the policy decisions. We derive these two learning processes from the literature on policy learning. Since the early 90s, scholars have discussed rather implicitly the link between decision makers' policy-oriented and power-oriented learning intentions (Bennett and Howlett 1992; Zito and Schout 2009). More recently, scholars have used the “old” distinction of “puzzling” versus “powering” to examine different aspects of policy learning (Dunlop et al. 2024; Trein and Vagionaki 2022).

Specifically, we distinguish policy-oriented learning and power-oriented learning as two distinct processes. This distinction builds on the work by Hugh Heclo who has distinguished the notions of puzzling and powering as two modes of action in the political process (Dunlop et al. 2024; Heclo 1974).

(1) ***Policy-oriented learning*** focuses on improving the technical effectiveness and efficiency of policies. This process entails understanding what works from a technical perspective, for

instance, by consulting experts (Cairney and Wellstead 2021; Dunlop 2014), analyzing inputs from policy labs (Fleischer and Carstens 2022), or drawing evidence-based lessons from other jurisdictions where specific policy instruments have been evaluated (Maggetti and Gilardi 2016; Trein, Presset, and Vagionaki 2025). Specifically, the concept of policy-oriented learning resembles the notion of learning in the Advocacy Coalition Framework (ACF), which builds on the notion of puzzling introduced by Hugh Heclo (Moyson, Scholten, and Weible 2017; Pierson 1993). This form of learning focuses on improving policy solutions to better deal with complex policy problems; it also refers to learning about political strategies to re-introduce policy solutions. It should be noted that learning within the ACF mostly focuses on policy innovations (Torfing and Ansell 2017, 44). Apart from the ACF, policy-oriented learning resembles the notions of learning dealt with in instrumental and social learning. The former type of learning refers ‘to the update of beliefs concerning the ‘viability of policy interventions or implementation designs’ while social learning to the ‘social construction of a policy problem’ by specific policy instruments (Trein and Vagionaki 2022, 911).

(2) ***Power-oriented learning*** refers to learning about how to use new information strategically to generate political influence, regardless of the substantive content of the policy (Bundi and Trein 2022; Trein and Vagionaki 2022). This process involves understanding how to best defend a set of interests within a collaborative setting. Political learning acknowledges that actors are office- and vote-seeking, and that policymaking is primarily viewed as a means to achieve political goals, with the pursuit of political interests being central to decision-making (Strom 1990). In other words, policymakers filter evidence and knowledge according to their political goals (Gilardi 2010; Trein, Presset, and Vagionaki 2025).

Power-oriented learning emphasizes learning about strengthening political influence, rather than pursuing a specific policy agenda. This form of learning resembles what Peter May refers

to as political learning; ‘a strategy for advocating a given policy idea or problem’ (May 1992, 336). Like policy oriented-learning, power-oriented learning is about drawing lessons which policies are acceptable and therefore politically viable. Power-oriented learning may overlap with policy-oriented learning, its main orientation is however towards updating beliefs about what is acceptable for interest groups and the mass public (Pierson 1993). In some cases, this process of learning may result in policy solutions that do not help solving the underlying problem.

Specifically, for our purposes, we define policy-oriented learning and power-oriented learning as two processes that consist of different manners of reflection and updating of beliefs, and that might potentially involve different mechanisms and actors. In essence, we distinguish between two learning processes that differ in terms of what decision-makers learn. Yet both are important for the policy process and explain policy change. Table 1 illustrates in a simplified way how the configuration of these two collective learning processes unfolds in relation to the results of learning and policy change. We assume that limited learning in both processes is associated with limited innovation (broadly defined as non-trivial change of policy or organizational practice). A dominance of power-oriented learning over policy-oriented learning tends to produce politically acceptable solutions with limited functionality, whereas a dominance of policy-oriented learning over power-oriented learning tends to result in technically functional solutions with limited political or societal acceptability (Trein, Presset, and Vagionaki 2025). Therein, it is important to keep in mind that our reflection on the link between policy innovation and learning does not make a normative statement about whether the lessons that are learned are positive or negative (Bishoy L. Zaki 2024a).

Table 1: Policy-oriented and power-oriented learning in relation to outputs

		Power-oriented learning	
		<i>limited</i>	<i>important</i>
Policy-oriented learning	<i>limited</i>	No innovation / trivial change	Acceptable solution with limited functionality
	<i>important</i>	Functional solution with limited acceptability	Acceptable and functional solution

Source: Authors (2026)

In relation to policy-oriented learning, power-oriented learning can take two distinct forms. First, it may involve learning how to generate political support—or "buy-in," as termed in the project management literature (Mathews and Crocker 2016)—among potential veto players. In this context, policy-oriented and power-oriented learning reinforce one another. Second, power-oriented learning may entail that the results of policy-oriented learning are either disregarded or shaped to align with political priorities, even if this leads to the implementation of projects with limited impact. In this case, power-oriented learning undermines the policy learning process by instrumentalizing knowledge for political purposes (Boswell 2009; Trein, Presset, and Vagionaki 2025).

Subsequently, an important question is, how to ensure that policy-oriented learning and power-oriented learning work in a policy process at the same time, and speak to each other. We develop an argument that points out that both dimensions are naturally unrelated. In other words, they are learning processes that are rather disconnected, somewhat like loop-level parallelism in computing. As a result, learning in the policy process resembles a sequential learning process.

3. Loop-level parallelism and learning in the policy process

In the following, we theorize the link between policy-oriented and power-oriented learning. Therein, we follow Dunlop et al. who, “... explore the conceptual and empirical territory that comes after disposing of the dichotomous approach of ‘powering versus puzzling’” (Dunlop et al. 2024, 1986). Our aim is to theorize the relationship between policy-oriented and power-oriented learning and reflect on how the two can be linked in the policy process. Therefore, we build on the literature related to computer science, as well as insights from research on policy failure. Specifically, we point to the role of time and sequences regarding the link of policy-oriented and power-oriented learning.

3.1 Parallel and sequential loops in learning

Our main argument is that policy-oriented learning and power-oriented learning might occur either as parallel loops, or as sequential loops. Our conceptualization of learning loops in public governance diverges from the notion of double-loop learning (Argyris 1977). Rather than examining the depth of learning, we employ the notion of loops to point out that learning in public policy entails various learning processes, each of which are likely to involve different actors, and occur either in parallel or sequentially, regarding a specific problem.

The idea of loop-level parallelism is known in programming. It involves the simultaneous execution of multiple threads or processes, where different tasks or code segments are programmed to run concurrently on parallel processors (Larus 1993; Wismüller 2011, 1079). This logic implies that learning in the policy process requires that policymakers engage in learning processes on how to solve a problem technically, whilst also in parallel, that they engage in learning about how to generate support amongst stakeholders and veto players. In practice, agents in the policy process—such as politicians, bureaucrats, and affected parties—must engage in both policy-oriented and power-oriented learning to develop innovative public policies and services that are both effective—achieving changes in target group behavior—and

legitimate, by garnering sufficient support for implementation (Trein, Presset, and Vagionaki 2025).

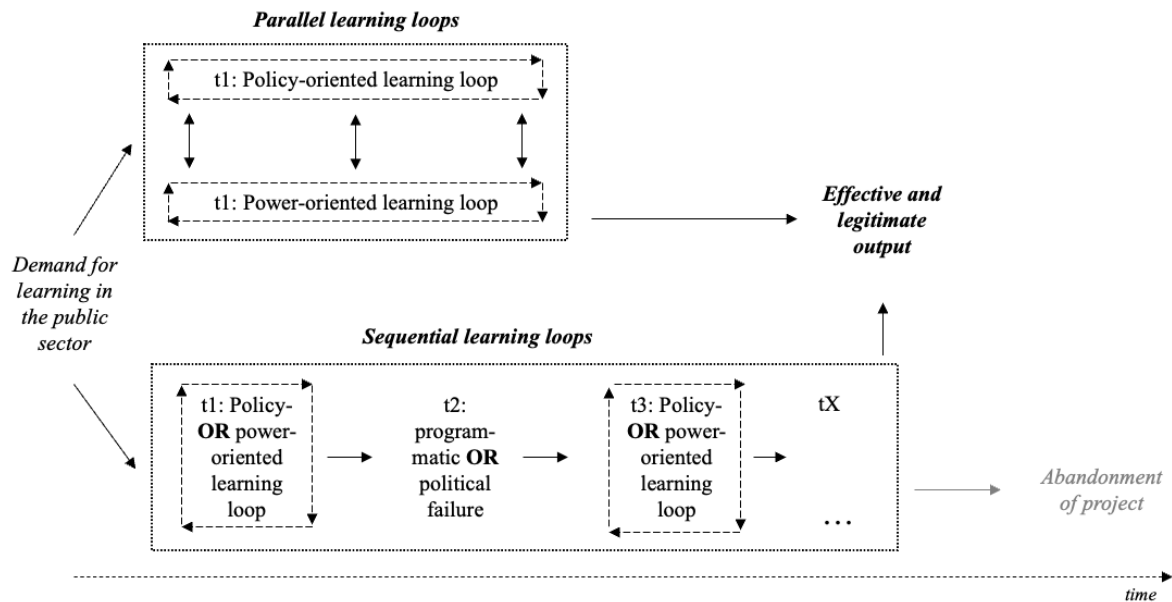
On the contrary, sequential loops imply that the learning process primarily focuses on either policy-oriented or power-oriented learning. In this context, the notion of sequences means that, during the first period, either policy-oriented learning dominates while power-oriented learning is limited, or vice versa. Due to this imbalance and the resulting deficiencies in the learning process, several subsequent periods follow one another. The breaks between these periods are marked by decisions on whether to adopt a policy change (Trein, Presset, and Vagionaki 2025).

The result is a one-sided approach to learning that primarily focuses on one of the two learning processes. Therefore, the likelihood of failure in the policy process increases - due to the lack of balance in the learning approach. Notably, if actors concentrate on power-oriented learning during the initial stage, there is a risk of programmatic failure (McConnell 2015), as the learning process prioritizes political acceptability over policy effectiveness. In other words, the policy process proceeds with a solution that is acceptable to many, but at the risk of producing a policy that is either difficult to be implemented or that does not change the status quo very much. Nevertheless, it appeases the most important constituencies and mutes veto players. Consequently, although there is policy change, the result of the learning process is unlikely to improve the policy program. As a result, the pressure to augment policy-oriented learning increases. This logic focuses above all on feedback from within the policy network. It does not assume that there is direct feedback from voters, since recent research on political communication suggests that politicians believe that voters care mostly about symbols, emotions, and messages, rather than about substantive policies (Falcão et al. 2023; Lubej, Dolezal, and Kirbiš 2025). Although recent work on perceptual accuracy of voter preferences

by politicians suggests that voters are more policy-oriented than politicians think (Lucas et al. 2025; Pilet et al. 2024).

Conversely, if the process emphasizes policy-oriented learning early on, there is a risk of political failure (McConnell 2015), as the proposed policy solution might fail to gain political support. In such cases, learning resumes with a focus on political considerations only after the political failure becomes evident—assuming the policy problem remains relevant. The sequence can also be reversed. For instance, if power-oriented learning dominates in t1, this may lead to the preliminary implementation of a project. Such a sequence might result either in the successful implementation of a digital innovation or in the termination of a project that was initiated but could not be improved due to multiple sequential learning loops.

Figure 1: Learning loops in the policy process



Source: Authors (2026)

Figure 1 illustrates the scenarios of loop-level parallelism and sequential learning. In the parallel learning loop scenario, actors such as bureaucrats, elected officials, firms, interest groups, and professional organizations collectively learn both about the technical aspects of

addressing a policy problem (e.g., implementing an EHR system or reforming a fiscal equalization system) and, simultaneously, about the political feasibility and implications of the innovation project, including the assessment of political viability. The consequence of loop-level parallelism is that the learning process leads to the adoption of a policy innovation that is both functional and politically acceptable. Figure 1 refers to this outcome as effective and legitimate output.

The second scenario considers the two learning loops as sequential, wherein participants in a collaborative innovation process first focus on either policy-oriented learning or power-oriented learning, followed by the other. Several of these sequences might be required to achieve the successful implementation of a public sector innovation. Figure 1 illustrates this sequential approach, depicting the policy-oriented learning loop as occurring first, followed by the power-oriented learning loop. In this instance, the model comprises at least two periods or more (t_1 – t_3 , in Figure 1).³

This theoretical approach, which incorporates the idea of loop-level parallelism and sequential loops with regard to policy-oriented and power-oriented learning, allows us to integrate the concepts of failure and temporality into our understanding of policy learning. While the role of failure in policy processes is not a novel insight, our contribution to the literature lies in highlighting how failure can be an important mechanism that mediates between policy-oriented and power-oriented learning processes (Dunlop 2017; Leong and Howlett 2022; Trein and Vagionaki 2024). At times, these dynamics may involve deliberately learning the “wrong” or “negative” lessons in order to implement a policy program that can later be revised and improved. However, it is important to keep in mind that once a poorly designed or implemented

³ Figure 1 also refers to the option of an abandonment of the collaborative innovation process after learning. This result is an option in the process, which we however do not theorize in the remainder of the chapter.

policy is in place, it can create institutional incentives that shape subsequent learning and hinder the modification or abandonment of the policy.

Moreover, this chapter underscores the importance of time in understanding the relationship between policy-oriented and power-oriented learning. Our theoretical reasoning suggests that we must take seriously the potential sequencing of learning in the policy process. We will elaborate on this point further in the next section.

Finally, it is important to note that the analogy of loop-level parallelism from computer science can only be partially applied to the study of public policy. In computer science, loop-level parallelism distributes distinct tasks across processing units, ultimately yielding a logically coherent and hierarchical outcome. As we argue in the following section, this logic does not neatly apply to the policy process, particularly because learning does not always occur within cohesive or coherent decision-making structures.

4. Implications for policy research

What are the implications of this research for the literature on public policy and policy learning? Firstly, the findings suggest that we should expect a sequential pattern in many learning processes. In some cases, these sequences might begin with policy-oriented learning and be followed by power-oriented learning. In this context, the focus of state policy processes and associated learning often lies initially on policy-oriented aspects, such as understanding and developing new policy instruments. Power-oriented learning, which involves building political support and crafting politically feasible reforms, typically follows thereafter. Conversely, in other cases, the sequence may be reversed. There may be an emphasis on securing political

feasibility and stakeholder buy-in from the outset, potentially at the expense of a more robust technical design.

This tendency is particularly pronounced when the policy issue is highly politicized—that is, it receives substantial attention from the media, parliament, and other political arenas, and is subject to intense negotiation and bargaining. In contrast, a depoliticized policy issue provides greater space for expert involvement and the formulation of more complex, technically sophisticated solutions. Under conditions of high politicization, prioritizing power-oriented learning may result in reforms that are politically viable but technically limited, necessitating further adjustments in the future. Conversely, in cases of depoliticization, the focus on technical design may lead to reforms that, although technically sound, face strong political opposition and potential backlash. For example, during the Euro crisis instrumental learning was difficult and European leaders did not learn how to deal with high levels of sovereign debt together, until the European Central Bank intervened (Mody 2014).

This dynamic can be considered alongside other explanatory factors for different modes of policy learning, such as the tractability of the problem and the degree of actor certification—both of which have been shown to significantly influence how learning occurs (Dunlop and Radaelli 2018). Our analysis contributes to this line of inquiry by integrating a problem-oriented logic with a power- and influence-oriented logic in the policy learning process. In some ways, the sequences to learning consider the role of time which is important for learning as Radaelli points out in his distinction of inferential and contingent learning in different crises (Radaelli 2022).

Secondly, given this context, how can parallel learning loops be achieved—how can we integrate policy-oriented and power-oriented learning? A key factor lies in the involvement of

actors capable of combining technical policy design with processes that generate stakeholder support. Thus, attention should be paid to the roles of policy entrepreneurs and political entrepreneurs in facilitating learning. More specifically, our research underscores the importance of the "learning entrepreneur"—an actor (individual or collective) who not only grasps the technical and substantive aspects of a policy but also effectively mobilizes political support, anticipating strategic considerations such as office- and vote-seeking behavior. The learning entrepreneur thus combines the characteristics of both policy and political entrepreneurs while also serving as a teacher and facilitator—offering leadership both in terms of content and coalition-building (Herweg, Huß, and Zohlnhöfer 2015). This role can be fulfilled by individuals or groups embedded in organizational or collective structures. A recent contribution by Zaki points in a similar direction, but more empirical research on the agency of policy learning is necessary (Bishoy L. Zaki 2024b).

Thirdly, another factor that may contribute to coupling policy- and power-oriented learning is the occurrence of external shocks, such as crises, especially if these are fast burning and important crises (Ladi and Tsarouhas 2020; Radaelli 2022). If governments are facing major challenges, such as mega crises that come along with high levels of uncertainty, they need to update their beliefs in order to produce a response to the crisis shock. This process requires combining learning processes about the content of the policy measures that need to be put into place in response to the crisis, as well as about how to explain them and to make sure that the population accepts the measures taken. The COVID-19 pandemic has demonstrated that it is, in principle, possible to combine technical expert learning with the political construction of policy support. For example, in the UK, the Johnson government learned that its initial approach to COVID-19 that was based on the idea of herd immunity was not acceptable politically and that it needed to pursue a different strategy. Countries differed, however, in the extent to which they succeeded in merging these two learning processes. One empirical approach to this issue

would be to assess whether a country implemented COVID-19 responses that were both technically effective in managing the virus and successful in avoiding increased political polarization or widespread public opposition to the adopted measures.

5. Conclusions

This chapter contributes to the literature on policy learning by offering a novel conceptual framework that distinguishes between policy-oriented and power-oriented learning as separate processes, which need however to be linked in order for learning to become part of the policy process. By drawing on the metaphor of loop-level parallelism, we argue that effective and legitimate policy innovation is most likely when both learning loops occur concurrently. However, as is often the case in real-world policymaking, learning processes unfold sequentially, thereby increasing the likelihood of either programmatic or political failure.

We have shown that understanding the temporal relationship between these learning loops is essential to explaining how learning translates into policy change—or fails to do so. Our analysis highlights that policy learning does not follow a linear or uniformly rational trajectory. Instead, it is frequently shaped by institutional fragmentation, strategic considerations, and actor constellations that influence whether and how learning loops inform each other.

By theorizing the interplay of parallel and sequential loops, we offer a lens through which scholars and practitioners can better grasp the complexity of learning in the policy process. This framework has important implications for future research, including comparative analyses of learning configurations across policy domains, and provides a conceptual basis for designing institutional settings that foster mutual reinforcement between problem-solving and political viability. Ultimately, more balanced and integrated learning processes are vital for realizing the full potential of evidence-informed and democratically legitimate public policies.

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