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Types of learning and varieties of innovation: how does policy learning enable policy innovation?

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Policy innovation is considered important for addressing major challenges such as climate change and the sustainable energy transition. Although policy learning is likely to play a key role in enabling policy innovation, the link between them remains unclear despite much research on both topics. To address this gap, we move beyond a binary treatment of policy innovation and differentiate policy problem innovation from policy instrument innovation and policy process innovation. Subsequently, we synthesise the literature on policy learning with the research on the multiple streams framework (MSF), a well-known lens for explaining policy innovation. Like earlier policy learning studies, we distinguish several types of learning by posing the key questions of learning, but in the context of each stream of the MSF: who learns (actors), what (beliefs), how (modes), and to what effect (ripening). This new conceptualisation clarifies the relationship of each type of policy learning to the varieties of policy innovation. Further, it indicates that policy learning is likely to result in policy innovation if and only if it influences the coupling among the three streams during a window of opportunity – through policy entrepreneurship – and not otherwise. We conclude with the implications of this study for future research on policy innovation, policy learning, and the MSF.

Introduction: Policy innovation and policy learning

Policy innovation involves a multidimensional perspective on public policymaking incorporating the study of topics such as policy invention, policy diffusion, and policy success (Jordan and Huitema, 2014b; Jordan and Huitema, 2014c). It is often considered necessary for addressing 'the root causes of … problems instead of the

symptoms' (Unrisd, 2016) and solving grand challenges such as climate change or the energy transition in order to move towards a more sustainable future (Goyal, 2019).

Policy learning – whether conceived as the circulation and consumption of policy-relevant knowledge; as an intentioned acquisition, interpretation, and application of knowledge; or an updating of beliefs concerning public policy within a policy subsystem (Heclo, 1974; Sabatier, 1988; Motta, 2018; Zaki et al, 2022) – is commonly thought to be essential for 'intelligent' policymaking (Sanderson, 2009), for the diffusion, transfer, or translation of new policies (Meseguer, 2005; Stone, 2012), and for effective governance in the long-term (Sanderson, 2002). And, it is often considered to be a source of policy innovations.

While the relationship between policy learning and policy innovation has been mooted for some time, insights on it lie fragmented across the literature on knowledge utilisation; (multi-level) governance; policy change; policy diffusion, transfer, or translation; policy learning; and social learning (Goyal and Howlett, 2018b). How exactly does policy learning drive innovation and when and under what conditions does this occur? Classic works in policy studies addressed these questions to some extent (Heclo, 1974; Sabatier, 1988; Rose, 1991; Hall, 1993), but captured only some of the actors, lessons, dynamics and outcomes involved in this relationship (Bennett and Howlett, 1992). Despite much research on the topic since then, the mechanisms that link policy learning to policy innovation remain unclear (Dunlop and Radaelli, 2013; Goyal and Howlett, 2018a; Zaki et al, 2022).

In this study, we theorise how and when policy learning results in policy innovation. To address this subject, we clarify the notion of policy innovation and (re-)conceptualise policy learning using the multiple streams framework (MSF), a well-known framework for studying the interplay of structure, agency, and randomness in the policy process (Kingdon, 1995). Originally developed with a focus on agenda setting, the MSF has since been expanded and applied to study different stages of the policy process (Zahariadis, 2003; Howlett et al, 2015), including policy adoption (Zahariadis, 1992; Herweg et al, 2018; Goyal et al, 2021), with or without policy diffusion (Cairney, 2009; Lovell, 2016; Goyal, 2021b), and policy implementation (Ridde, 2009; Fowler, 2019; Howlett, 2019; Goyal et al, 2020).

Specifically, we answer the key questions associated with policy learning – who learns, learns what, learns how, and to what effect – in the context of each stream of the MSF. Further, we highlight that different types of policy learning can induce a variety of policy innovations. Thus, whereas much recent research has focused on policy learning as a dependent variable, here we emphasise its role as an independent variable affecting the policy process and innovation. This conceptualisation helps us better understand the link between policy learning and policy innovation, and sheds light on whether, how, and when the former is likely to result in the latter. In addition, it has implications for research on the policy learning as well as the multiple streams framework.

Policy innovation: invention versus innovation, lower-order versus higher-order change, and process versus product

According to Schumpeter (1939: 84), 'innovation is possible without anything we should identify as invention and invention does not necessarily induce innovation, but produce of itself no economically relevant effect at all.' In other words, invention and innovation

are not the same. This is true in the case of policy invention and policy innovation as well as in the process and product innovations that Schumpeter dealt with in his work.

While policy invention is about the creation of entirely new policy designs, policy innovation entails novelty within a specific context that can: (i) result from recombinations of existing elements in a novel way; or (ii) occur possibly – but not only – through policy diffusion, transfer, or translation from some other already existing exemplar (Jordan and Huitema, 2014a). Thus, for this study novelty in a specific context rather than invention is considered to be an important characteristic of policy innovation. Nevertheless, it is generally accepted that policy innovation requires significant deviation from the status quo, even if the extent of alteration is context- or location-specific in the sense of replicating or adapting work done elsewhere.

Earlier work in public policy associated significant deviation from the status quo with a change in policy objectives (which was considered to be 'higher-order' change) while changes in policy instruments or calibrations, for example, were considered to be instances of routine (or 'lower-order') change (Hall, 1993). Subsequently, Cashore and Howlett (2007) showed that higher-order change can occur in policy objectives as well as policy instruments. Based on this view, Howlett (2014) proposed that non-incremental change in either policy objectives or policy instruments – that is, going beyond mere tinkering with specific targets, instrument calibrations, or modes of service delivery – can be considered as policy innovation. We consider non-incremental change to be a feature of policy innovation, but do not associate such change (only) with the revision of policy objectives.

The literature in public policy has also delved into the question of whether innovation is a process or an outcome (Jordan and Huitema, 2014c). Policy process theories, for example, lean towards the former perspective while the literature on policy design, for example, leans towards the latter. Jordan and Huitema (2014b) embraced both possibilities by defining policy innovation as 'the process and/or product of seeking to develop new and/or widely adopted, and/or impactful policies, when existing ones are perceived to be under-performing'. Here, the use of the term process is still to indicate the *process of innovation* and not *innovation in the process* itself.

Yet, an innovation in the policy process can itself be considered as a type of policy innovation, regardless of whether it results in novel policy designs. Illustratively, in the collaborative governance paradigm, the private sector is involved more closely in the policy process, for example, in order to create a suitable policy design (Gieske and Van Buuren, 2015). Similarly, the policy hub or the policy innovation lab, which aims to stimulate innovation in policy design through design thinking, experimentation, and 'user' involvement (Brock, 2020; Wellstead et al, 2021), is itself a novel approach to policy formulation. Further, phenomena such as co-creation, co-design, co-governance, co-implementation, co-regulation all represent novel ways of organising the policy process and constitute policy innovation (Ackerman, 2004; Steurer, 2010; Voorberg et al, 2015; Blomkamp, 2018; Masunaga et al, 2021; Paidakaki et al, 2022). Participatory modelling, which involves 'stakeholders' in the identification, clarification, and analysis of policy issues as well as policy alternatives is also an example of innovation in the policy process.

Therefore, rather than treating policy innovation in a binary manner as is done in much of the existing literature, we conceive policy innovation as a non-incremental change in problem framing, policy instrument (mix), or policy process that is novel in a specific context (Table 1). An implication of this conceptualisation is that policy innovation can occur at any stage of the policy process.

Table 1: Varieties of policy innovation

Type of innovation	Focus	Example
Policy problem innovation	Policy objectives or problem framing	Change in policy priority from unemployment to inflation
Policy instrument innovation	Policy instrument (mix) choice or design	Change from command-and-control regulation to nudging
Policy process innovation	Organisation or structuring of the policy process	Change from top-down design to co-design or participatory budgeting

The research on policy learning: limited lessons for policy innovation

Research on policy learning balances the traditional emphasis of policy studies on the politics of policymaking processes with a positive or normative focus on the role played by knowledge in those processes. In the early literature on the topic, scholars such as Walker (1969), Heclo (1974), Sabatier (1988), Hall (1993) and Rose (1991) showed that 'powering' and 'puzzling' coexist in the policy process and shed light on the considerations upon which one might be play a more important role than the other in policy change, policy diffusion, or policy transfer. Although these scholars often conflated the actors, lessons and outcomes of learning (Bennett and Howlett, 1992), their work led to much interest in this research area.

Subsequent research has approached policy learning from various perspectives. Apart from policy learning and lesson-drawing (Rose, 1991; Dunlop and Radaelli, 2013), these lenses include the advocacy coalition framework (Weible et al, 2009; Moyson, 2017), knowledge utilisation (Weiss, 1977; Boswell, 2008; Hertin et al, 2009), (multi-level) governance (Oates, 1999; De La Porte et al, 2001; Borrás and Jacobsson, 2004; Saam and Kerber, 2013), policy diffusion (Meseguer, 2006; Gilardi, 2010), policy implementation (Schofield, 2004; Grin and Loeber, 2007), and policy transfer (Dolowitz and Marsh, 1996; Dolowitz and Marsh, 2000).

Over the last decade, a concerted – but not entirely successful – effort has been made to address fragmentation in the field and synthesise the different strands of research on policy learning (Dunlop, 2017; Dunlop et al, 2018). In their systematic review of the topic, for example, Dunlop and Radaelli (2013) proposed to focus more closely upon modes of learning – which are posited to vary based on the certification of actors and problem tractability – and applied this framework, for example, to explain 'wrong' learning in the Eurozone dept crisis (Dunlop and Radaelli, 2016). Further, Dunlop and Radaelli (2018) also identified the triggers, hindrances, and pathologies of the different modes of learning. In addition, efforts have been made to strengthen the micro-foundations of the field by systematically distinguishing between individual, group or organisational, and system learning (Moyson et al, 2017), conducting research on individual learning (Kamkhaji and Radaelli, 2017; Moyson, 2017), and showing their linkages (Dunlop and Radaelli, 2017) in order to facilitate analytical clarity and evidence synthesis.

Cumulatively, the research on policy learning has created knowledge, for instance, on the characteristics that limit the role of policy(-oriented) learning; the different uses of knowledge made in the policy process; how learning differs in horizontal, multilevel, and/or transnational contexts; and how learning can influence and result from policy change. However, the findings across the different strands of research:

(i) are challenging to synthesise within a coherent framework due to differences in worldviews and terminologies; and (ii) often shed little light on the distinction between innovative and non-innovative learning as well as how and when such learning is likely to result in policy innovation.

The continuing fragmentation of studies of policy learning has been emphasised by recent meta-reviews on the subject (Goyal and Howlett, 2018b; Zaki et al, 2022). There continues to be disagreement regarding the definition of policy learning, including whether it refers to the circulation of knowledge or the updating of beliefs, and whether it is intentional or unintentional (Dunlop and Radaelli, 2013; Motta, 2018; Zaki et al, 2022) and a variety of terms are still used to refer to learning – such as institutional learning, instrumental learning, political learning and social learning – which conflate the distinct motives, actors, lessons and outcomes associated with different modes of learning (see, for example, (Hall, 1993) and (Siddiki et al, 2017) on social learning). And despite the elicitation of various triggers, hindrances and pathologies of policy learning, a coherent theoretical framework linking policy learning and policy innovation remains elusive (Goyal and Howlett, 2018a).

The multiple streams framework: policy learning as a source of stability in the policy process

To make progress in this regard, a conceptual apparatus to highlight and theorise the links among individual learning, organisational learning, and system learning is needed. This framework should allow for the possibility of negative lessons – that is, learning regarding what not to do rather than what to do – leading to policy stasis or policy termination. And, if it is to shed light on the relationship between learning and innovation, it should be able to distinguish between incremental policy change and policy innovation. One approach to this could be to advance the conceptualisation of policy learning within existing theories of the policy process. Although many scholars have articulated the need to situate policy learning in larger context of the policy process (Bomberg, 2007; Goyal and Howlett, 2018a; Zaki et al, 2022), little effort has been made in this direction.

A possible framework enabling such an advance is the MSF. The MSF was initially proposed by Kingdon (1995) to explain agenda setting at the federal level in the United States of America. Building on earlier work in organisational behaviour (Cohen et al, 1972), the framework comprised five key elements – three streams of activities, the notion of windows of opportunity for change, and the key role played by policy entrepreneurship – which were argued to coalesce in moving issues on to the official policy agenda.

In this framework, the problem stream involves the interpretation of societal conditions as 'problems' depending on focusing events, indicators, and policy feedback. The policy stream on the other hand models the evolution of policy alternatives as they undergo 'mutations' and 'recombinations' for survival based on criteria such as financial viability, technical feasibility, and value acceptability. And the politics stream captures dynamics that influence the ability and willingness of the government to undertake policy action, such as the balance of interests, administrative and political turnover, or public mood. Kingdon hypothesised that an issue is more likely to be placed on the policy agenda during specific periods of time, that is, windows of opportunity often involving some internal deadline or an exogenous 'focussing event',

when the three streams are 'ripe' allowing waiting policy entrepreneurs to be able to 'couple' them and move a policy proposal forward. A key reason for the enduring appeal of the framework has been its ability to account for the apparent contingency – and possibly randomness – of the policy process, which results in change on some occasions but not others. Building on the garbage can model of organisational choice, the framework assumes the presence of problematic societal preferences, unclear 'technology' linking the problem and the solution, and fluid participation in decision-making (Cohen et al, 1972).

While the original framework downplayed the sources of stability and change in policymaking, subsequent research on the framework has made significant progress in this regard. First, scholars have highlighted the role of the prevailing institutional environment, path dependence, and the existing policy mix of the policy process (Liu et al, 2010; Spohr, 2016; Sager and Thomann, 2017). Second, the role of networks in influencing problem framing, alternatives specification, and political decision-making have received more attention (Durant and Diehl, 1989; Zahariadis, 2003; Reardon, 2018). Third, the roles and types of policy entrepreneurship have been elaborated within each stream of the framework to provide a better account of actors and activities (Herweg et al, 2015; Knaggård, 2015; Mukherjee and Howlett, 2015; Goyal, 2019).

The MSF has also become a well-known framework to study policymaking more generally (Zahariadis, 2003). It has been extended and applied to study other dynamics of the policy process, including policy adoption (Zahariadis, 1992; Herweg et al, 2018; Goyal et al, 2021), policy diffusion (Cairney, 2009; Lovell, 2016; Goyal, 2021b), policy implementation (Ridde, 2009; Howlett, 2019; Fowler, 2020; Goyal et al, 2020), and policy success (Fowler, 2019; Goyal, 2021a). These advancements have also resulted in variants of the framework. For instance, although Zahariadis (1992) did not distinguish between the agenda setting stage and the decision-making stage while applying the MSF, Herweg et al (2015) proposed a separation of windows of opportunity and policy entrepreneurship required during agenda setting and decision-making. Meanwhile, Howlett et al (2015) introduced two new streams – the process stream and the programme stream – to depict activities beyond agenda setting. However, these variants can be reconciled by viewing the process as a component of the politics stream and the programme as a component of the policy stream and considering the necessity of windows of opportunity and policy entrepreneurship at different stages as an empirical question rather than a theoretical one (Goyal and Howlett, 2020a; Goyal, 2021a).

Consequently, the MSF can be usefully put to work in the examination of policy learning and policy innovation.

Conceptualising policy learning using the multiple streams framework: learning in the problem, the policy, and the politics streams

Although the role of policy learning has not been elaborated within the MSF, the framework provides the conceptual apparatus for studying its relationship with policy innovation (Goyal and Howlett, 2020b). Illustratively, Goyal (2021b) found that lesson drawing played a key role in ripening the policy stream in the case of the diffusion of the energy conservation building code to a state within in India. Similarly, in his study on the adoption of an emissions trading scheme in Germany, Brunner (2008)

found that learning processes influenced policy adoption and argued for extending the MSF with 'other potentially insightful analytical approaches'. In another instance, Huber–Stearns et al (2019) argued that collaborative learning played a key role in the formulation of policy alternatives and extended the time for which the policy window remained open in the case of an institutional innovation in forest watershed governance in a state of the Unites States of America. Like Brunner (2008), they too recommend that 'those applying MSA pay attention to the role and potential importance of learning processes' (Huber–Stearns et al, 2019). We heed this call here by re-conceptualising policy learning within the MSF.

Learning in the problem stream

The problem stream captures elite perceptions of societal conditions. Learning in this stream – *problem learning* – is, thus, likely to focus on the acquisition or utilisation of knowledge pertaining to the framing of policy issues and, consequently, policy objectives. This type of learning has been also described as conceptual learning, double–loop learning, or social learning in the literature (Argyris and Schon, 1978; May, 1992; Hall, 1993; Sabatier, 1988). The specific beliefs associated with problem learning include the causes of the problem, identification of groups whose welfare is of greatest concern, the importance of causal linkages in different locales over time, the seriousness of the problem, the seriousness of specific aspects of the problem in specific locales (Sabatier, 1998). At the subsystem level, a change in these beliefs can result in problem (re-)framing.

Problem learning might be triggered by focusing events, indicators, or policy feedback. For example, Huber-Stearns et al (2019) argued that focusing events such as wildfires created space for learning in the case of watershed governance in the United States. Meanwhile, Ritter et al (2018) argued that, in the case of heroin overdose, relevant indicators regarding its effect on the medical community triggered learning at the individual level and led to dissemination of lessons in the wider society. Further, Hall (1993) highlighted the role of policy feedback in contributing to learning regarding policy objectives in the case of macroeconomic policy in Britain.

Several actors are likely to be involved in learning in this stream. Societal elites, for example, could be involved in problem learning based on experience and (social) interaction. Further, scientists or think tanks – in their individual capacity or as members of epistemic communities – can contribute to such learning through analysis (Godwin and Schroedel, 2000; Mukherjee and Howlett, 2015). Also, civil society, elected officials, and the media – possibly even as members of advocacy coalitions – might play a role in problem learning (Béland, 2006; Fisher et al, 2018; Goyal et al, 2020). For example, Lencucha et al (2018) have demonstrated the role played by a non–profit organisation in spreading information about the 'problem' of tobacco consumption through a public awareness campaign.

Learning in the policy stream

Recall that the policy stream represents the evolution of policy alternatives as they go through mutations and recombination to survive based on selection criteria. Learning in this stream – *policy instrument learning* – is, therefore, likely to focus on the acquisition or utilisation of knowledge regarding policy instruments (or mixes)

and their calibrations. Also, it could entail administrative or 'government' learning as administrators gain experience with implementation and fine tune or dramatically alter programme specifications (Howlett et al, 2015). This type of learning has been variously described as instrumental learning, single-loop learning, or technical learning in the literature (Argyris and Schon, 1978; Sabatier, 1988; May, 1992; Hall, 1993). The relevant beliefs involved in this stream span the ability of society to solve the problem, the distribution of authority between government and market, performance of specific programmes or institutions, the method(s) of financing, the priority accorded to various policy instruments, and administrative rules, budgetary allocations, disposition of cases, and statutory interpretation (Sabatier, 1998). At the subsystem level, a change in these beliefs can result in new, viable policy alternatives or – in case of a negative lesson – awareness regarding the infeasibility of policy alternatives.

Policy instrument learning can occur through different modes at different stages of the policy process. Its key mechanisms include analysis or reasoning, experimentation or policy piloting, experience, and lesson drawing (Thaler et al, 2020). Also, social interaction – for example, through participation in common forums or venues – could aid policy instrument learning (Malkamäki et al, 2021). These mechanisms are also likely to differ at different stages of the policy process, such as from learning in the laboratory or model-based learning during policy formulation (Knoepfel and Kissling–Näf, 1998) to social interaction or trial–and–error during policy adoption and policy implementation (Hall, 1993; Arnold, 2014; Lencucha et al, 2018).

Several actors might be involved in policy instrument learning. Following the MSF, policy communities are likely to play a key role in this type of learning (Kingdon, 1995). Recent research has also identified the role of instrument constituencies in promoting policy alternatives independent of the problem framing (Voß and Simons, 2014; Mukherjee and Howlett, 2015; Béland and Howlett, 2016). Douglas et al (2015) document the role of even epistemic communities in facilitating policy instrument learning through diffusion. Further, low- or mid-level bureaucrats or public sector agencies responsible for policy implementation can also contribute to learning in this stream. Under some circumstances, citizens also contribute to policy instrument learning (Callaghan and Sylvester, 2021). Policy entrepreneurs are likely to be especially active in undertaking and promoting learning in this stream due to their interest in pushing a policy solution through the process.

Learning in the politics stream

The politics stream is dominated by characteristics such as the balance of interests, party ideologies, and public mood. Thus, learning in this stream – *political learning* – pertains primarily to the acquisition or utilisation of knowledge regarding the (politics of the) policy process. Here, we use the term political learning rather than inventing a new one, but mean it in a broader sense than what has previously been described as political learning or power-oriented learning in the literature (May, 1992; Millar, 2020; Trein and Vagionaki, 2022) and include the notion of governance learning (Challies et al, 2017). Further, political learning can involve lessons regarding the administrative dynamics and 'steering' of the policy process (Howlett et al, 2015).

The beliefs pertinent to this stream include the priority of ultimate values (such as freedom, security, power and knowledge); the relationship between the state and the society; the distribution of authority among levels of government (that is, degree

Table 2: The types of policy learning from a multiple streams perspective

Stream	Type of learning	Who learns?	Learns what?	Learns how?	To what effect?
Problem stream	Problem learning	Elites; (members of) epistemic communities; (members of) advocacy coalitions; civil society; the media	The causes of the problem; identification of groups whose welfare is of greatest concern; the importance of causal linkages in different locales over time; the seriousness of the problem; the seriousness of specific aspects of the problem in specific locales	Experience; (social) interaction; analysis	Problem (re-) framing
Policy stream	Policy instrument learning	Policy communities; (members of) instrument constituencies; (members of) epistemic communities; (low- or mid-level) bureaucracy; (exceptionally) civil society	The ability of society to solve the problem; the distribution of authority between government and market; performance of specific programmes or institutions; the method(s) of financing; the priority accorded to various policy instruments; administrative rules, budgetary allocations, disposition of cases, and statutory interpretation	Analysis or reasoning; learning in the lab; model-based learning; experimentation or piloting; trial-and-error learning; experience; lesson drawing; social interaction	(In)feasibility of policy alternatives and/or programme specifications
Politics stream	Political learning	Elected officials; (high-level) bureaucracy; political parties; interest groups; social movements; (members of) advocacy coalitions; the general public	The priority of ultimate values; the relationship between the state and the society; the distribution of authority among levels of government; basic criteria of distributive justice; the role of elected officials, administrators, experts, and the public in the policy process	Bargaining; experience; lesson drawing	Political and/or administrative (un)willingness to act

and form of decentralisation); basic criteria of distributive justice (that is, whose welfare counts); and the role of elected officials, experts, and the public in the policy process (Sabatier, 1998). At the subsystem level, updating of these beliefs can lead to re-alignment of interests, changes in party ideologies, altered voting behaviour, venue shifting, new ways of working with(in) multilevel governance, and re-organisation of the decision-making process, all of which might in turn influence the political (un)willingness to act.

Political learning can influence the balance of interests, alter party positions, inform the public mood, or affect the decision-making process. Political parties – in the government or outside – might, for instance, learn about platforms or policy issues that appeal to specific constituencies. Illustratively, Lencucha et al (2018) highlight that the party in government found the 'youth' frame to be useful for enlisting support of

a particular constituency (concerned parents) in the case of tobacco policy in Canada. Similarly, Matthijs and Blyth (2018) argue that policymakers learnt how to win an 'authority contest' rather than 'provide better macroeconomic outcomes' in the case of fiscal policy in the Eurozone in the aftermath of the 2008 financial crisis. In an example of non-learning in this stream, Dostal (2020) argues that policymakers in Germany did not pay heed to the difference in state–society relations while responding to the COVID-19 crisis based on the experiences of China and South Korea.

The actors involved in political learning include elected officials, high-level bureaucrats, interest groups, political parties, social movements, and the general public, in their own capacity and/or as members of advocacy coalitions (Mukherjee and Howlett, 2015; Lencucha et al, 2018; Matthijs and Blyth, 2018; Millar, 2020). They might engage in political learning typically through bargaining, experience, or lesson drawing (Gilardi, 2010; Dunlop and Radaelli, 2013; Challies et al, 2017).

The conceptualisation of different types of policy learning from an MSF perspective is summarised in Table 2.

Theorising the relationship(s) between learning and innovation: the role of opportunity and entrepreneurship

The conceptualisation suggests that type of learning is likely to influence the type of policy innovation. In one illustration of innovation due to learning in the problem stream, for example, Godwin and Schroedel (2000) showed how research conducted by the medical community in the United States led to framing of gun violence as a medical epidemic and contributed to local level policy innovation. Meanwhile, in an example of policy instrument innovation due to learning in the policy stream, Sieleunou et al (2017) demonstrated how the World Bank combined on knowledge-based and network-based influence – in the form of events, study tours, workshops, and (to a limited extent) scientific evidence – to facilitate the diffusion of performance-based financing in the health system in Cameroon (see also (Durant and Diehl, 1989) for a discussion on gradualist versus transformational ideation within the policy stream). Finally, process innovation is observed due to political learning, for instance, by Challies et al (2017) in their study on environmental policy in the European Union (EU), wherein policymakers learnt to design and implement participatory processes based on evidence and experience.

For policy learning to result in policy innovation, it must directly or indirectly contribute to the ripening of at least one stream before or during a window of opportunity. Although a window of opportunity was originally posited to open in the problem stream or the politics stream, subsequent research has found that activity in the policy stream can also open a policy window (Brunner, 2008; Lovell, 2016; Goyal and Howlett, 2020a). Further, windows of opportunity can be predictable – such as a budget cycle or an election – or unpredictable – such as a focusing event or a sudden change in the level of an indicator – and small (that is, ephemeral) or big (that is, open for a long time) (Howlett, 1998; Michaels et al, 2006; Herweg et al, 2018). Such variations in windows of opportunity can influence policy learning (Crow et al, 2018; Ladi and Tsarouhas, 2020; Thaler et al, 2020). In fact, studies have found that the extent and the types of learning are likely to vary depending on, among other characteristics, the size and types of policy windows (Keeler, 1993; Stern, 1997; Birkland, 1998; Birkland, 2006; Huber-Stearns et al, 2019; Page and Dilling, 2020;

Fuster et al, 2021). In addition, the ability to identify and act upon a policy window itself can be considered as an aspect of political learning (Howlett et al, 2015; Herweg et al, 2018; Solecki et al, 2019).

Further, the use of the MSF indicates that policy entrepreneurs are likely to play a key role in learning processes promoting policy innovation. Indeed, studies have found that policy learning is typically uneven and a few individuals or organisations can play a significant role in the process (Hall, 1993). And Knoepfel and Kissling-Näf (1998), for example, suggest 'strong personalities', including policy entrepreneurs, 'are the lifeblood of collective learning.' Recently, the problem broker – a type of policy entrepreneur in the problem stream – has been conceived as using knowledge, possibly in combination with emotions and values, for this kind of problem framing (Knaggård, 2015). In another study, Goyal (2021b) found that a transnational policy entrepreneur engaged in policy instrument learning in order to increase the viability of their preferred policy alternative. Moreover, policy entrepreneurs can act as not only learners but also teachers during the policy process (see also Bomberg (2007)). In line with this, Hatch and Mead (2019) proposed the notion of 'entrepreneur catalysed learning' to depict a form of policy learning facilitated by policy entrepreneurs. Relatedly, Sieleunou et al (2017) observed that the World Bank played an entrepreneurial role in catalysing policy learning and, thereby, policy innovation in Cameroon.

Moreover, an MSF perspective highlights the challenges of translating policy learning into policy innovation. When policy learning does not lead to the ripening of the stream or when the streams are not coupled during windows of opportunity, policy innovation is unlikely to ensue. This explains, for example, why Bandelow et al (2017) found learning to be necessary but not sufficient for policy innovation. Meanwhile Ritter et al (2018) demonstrated that innovative problem learning did not materialise into policy innovation due to the absence of a viable policy alternative and a lack of policy entrepreneurship. Relatedly, Oliver and Pemberton (2004) argued that while third-order learning can result in the adoption of new policy ideas, third-order policy change depends on the outcome of administrative and political battles and does not emerge fully blown from nowhere.

Discussion: lessons for policy innovation, policy learning, and the multiple streams framework

The proposed synthesis suggested here helps advance the research on policy innovation, policy learning, and the MSF in several other ways as well. First, it can add nuance to the literature on policy innovation, which has thus far not delved into different types or orders of innovation. Here, we proposed a first-order disaggregation of policy innovation into problem innovation, policy instrument innovation, and process innovation. It is also possible to distinguish first-order innovation from second-order innovation – that is, problem-policy instrument, problem-process, or policy instrument-process – and third-order innovation, that is, problem-policy instrument-process. Future research could use the MSF to understand (the variation in) the sources, patterns, and effects of different varieties of policy innovation as well as the role of policy learning therein.

Second, scholars typically juxtapose the 'depth', 'loop', or 'order' of learning with the type of learning. For example, as mentioned earlier, single-loop learning has been associated with policy instrument learning and double-loop learning with

policy problem learning. However, such a view assumes that the same actors learn the different types of lessons (in a sequence from a lower order to a higher order). In contrast, an MSF perspective suggests that different actors might learn different types of lessons, and lower and higher order learning might occur within each type. For example, lower order learning in the problem stream might rely on the use of existing indicators, while higher order learning might entail the creation of new – more contextually appropriate – indicators for informing perceptions of societal conditions.

Third, recent literature on policy learning has adopted a serial view of learning, that is, posited that the key dynamics of policy learning at a given time in the policy process can be captured by one mode of learning (Dunlop and Radaelli, 2016). However, a key premise of the MSF is that the three streams are 'loosely' coupled and evolve relatively independently of one another. Thus, an MSF perspective on policy learning suggests that different types of learning can occur – through different modes – in parallel during the policy process.

Fourth, the MSF has already been employed in a variety of contexts that engage with the notion of policy learning and can help develop the concept. Among others, this includes research on multilevel governance (Exworthy and Powell, 2004; Rietig, 2014), policy diffusion and policy transfer (Cairney, 2009; Goyal, 2021b; Lovell, 2016), policy failure and policy success (Zahariadis and Exadaktylos, 2016; Fowler, 2019; Goyal, 2021a), sociotechnical systems (Voß, 2007; Elzen et al, 2011; Goyal et al, 2021), and value change and value conflict (Goyal and Iychettira, 2022). Therefore, the use of the MSF for studying policy learning can facilitate synthesis of insights on the phenomenon across these different strands of research.

Fifth, following the garbage can model of organisational choice, the MSF has emphasised the role of randomness in the policy process. While this has contributed to its analytical appeal, it has also limited the ability of the framework to account for the rationality and stability observed in many real-world policy processes. To address this critique, scholars have elaborated on the role of institutions, networks, and path dependence within the framework (Durant and Diehl, 1989; Spohr, 2016; Sager and Thomann, 2017; Reardon, 2018). The conceptualisation of learning within the framework might, similarly, help explain why some policy processes are more 'rational' than others. Specifically, learning could reduce ambiguity by prioritising preferences, clarifying technologies, and stabilising participation. As a result, the synthesis with policy learning can help increase the analytical power of the MSF.

Sixth, the proposed conceptualisation can open the MSF to new research questions regarding the activities in each stream. For instance, are some beliefs more important than the others for the ripening of each stream? If so, which and why? And, do the beliefs of some actors influence this process more than those of others? If so, whose and why (Gronow et al, 2021)? Further, does knowledge utilisation – that is, the rational, legitimising, substantiating, or political use of evidence – vary by stream? If so, why (Plutzer et al, 1998; Seabrooke, 2012)? Or, is reflexive learning possible in each stream of the framework and, if so, why and how might it occur (Tanaka et al, 2020)? As a result, a learning perspective on the MSF can shed further light on the mechanisms underpinning the dynamics of each stream.

Finally, a learning perspective suggests that coupling might require at least some learning not just within a stream but also across the streams. This might, for example, entail learning between policy and politics streams in order to identify best practices

from other jurisdictions (that is, policy instrument learning) and re-packaging them for a different political ideology (Mallinson and Hannah, 2020). Or, it could involve an epistemic community learning about the 'true' nature of a policy problem (that is, problem learning) and – consequently – supporting a specific policy design or instrument proposed in the policy stream. Thus, zooming in on the role of knowledge creation, mobilisation, and utilisation within the MSF can also help crystalise the otherwise vague notion of coupling in the framework.

Conclusion: Opening another window of opportunity for policy studies?

The literature on public policy has identified a variety of possible relationships between policy learning and policy innovation. Scholars have found that policy learning may not result in policy innovation (Stone, 2012; Moyson et al, 2017), or have argued that it is not necessary for policy innovation (Sabatier, 1988), or that it is necessary but not sufficient for policy innovation (Bandelow et al, 2017). It is possible that the relationship between policy learning and policy innovation is complex and that all of the above may be contextually true. However, the absence of a theoretical framework that captures the varieties of actors, lessons, modes and outcomes identified in the literature on policy learning while also accounting for alternate explanations for policy innovation has stymied our understanding of how and when policy learning results in policy innovation.

In this study, we moved beyond a binary classification of policy innovation and classified the phenomenon as problem innovation, policy instrument innovation, and process innovation. Further, we conceptualised policy learning using the multiple streams framework (MSF). Specifically, we posed the key questions of policy learning – who learns, learns what, learns how, and to what effect – in the context of each stream in the MSF, in the process also associating different policy beliefs emphasised by the advocacy coalitions framework with the three streams. This conceptualisation enabled us to better identify the actors, lessons, modes and outcomes associated with the types of learning referred to most prominently in the literature: problem learning (that is, conceptual or social learning), policy instrument learning (that is, instrumental or technical learning), and political learning (incorporating governance, political, or power-oriented learning). Also, it indicated a link between the different types of learning and the varieties of policy innovation with problem innovation possibly requiring significant learning in the problem stream, policy instrument innovation requiring significant learning in the policy stream, and process innovation requiring significant learning in the politics stream.

Moreover, the MSF perspective suggests that policy learning results in (any variety of) policy innovation if – and only if – it contributes to the ripening of at least one stream and the subsequent coupling of the three streams through policy entrepreneurship, during a window of opportunity. Thus, where the recent literature on policy learning has considered the phenomenon primarily as a dependent variable, we emphasise its role as an independent variable in explaining how and when policy innovations occur and seek to advance the study of its relationship with policy innovation. In the process, we also advance research in policy studies by synthesising two previously disjointed, but significant research areas – those on the MSF and policy learning – in this field.

Conflict of interest
The authors declare that there is no conflict of interest.

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