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INTUITION, REASONING AND CAPACITY IN POLICYMAKING: BUILDING A COGNITIVE MODEL OF KNOWLEDGE AND EVIDENCE UTILISATION

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1 INTRODUCTION

The evidence-based policy (EBP) movement reinvigorated the demand for greater instrumental rationality in the affairs of the government. It emerged within the larger context of declining trust on governments and increasing availability of research evidence (Davies and Nutley, 2000). The growing body of research evidence on what works can be used to improve the effectiveness of policy initiatives and measures that could ameliorate loss of public trust (Sanderson, 2002). EBP sought to increase take up of these forms of evidence in order to "find the most reliable, most objective, most relevant evidence available and make the most out of it within practical constraints" (Bédard and Ouimet, 2016, p. 2). Evidence utilisation has been reinforced to promote instrumental rationality as a hallmark of a modern government. It represents the shedding of the vestiges of traditional, affective irrationality in favour of instrumental rationality. But just as EBP derives its legitimacy from its emphasis for objective analysis of scientific evidence, it is also the reason for its failures as a movement to foster better policymaking.

Much of the criticism EBP received came from its almost singular concern with scientific research evidence, making it largely ignorant of other factors that policymakers consider during decision-making. Evidence of what works about public policy grew as a result of the experimental turn in social sciences inspired by medical science (Banerjee and Duflo, 2009). For instance, it gave rise to the use of systematic reviews to appraise and synthesise evidence that exist in order to simplify the search for evidence (Young et al., 2002). Randomised control trials (RCTs) in development economics also became widespread and supported a bias towards counterfactual analysis as the 'golden standard' in policy research. However, RCTs are replete with practical problems that diminish their epistemic claims of effectiveness (Deaton, 2009). Because of this tendency to equate evidence

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with scientific research, the EBP movement neglected the fact that other forms of evidence generated outside scientific research are also evaluated particularly in policymaking (Cairney, 2016).

Despite some acknowledgement that factors other than evidence is considered in policymaking, EBP's modified version as being 'evidence-informed' still only treats scientific research as the only valid form of 'evidence' of what works. It assumes that policy problems can be truly understood and the most effective solution can be identified through scientific research. More often, the causal model that links the problem with the solution is contested and difficult to be known unless policies have been implemented (Colebatch, 2006; Hisschemöller and Hoppe, 1995). Notwithstanding the pious hopes of EBP advocates, what emerged now is "a concomitant crises of science, trust and of sustainability" that upended the ability of EBP's to drive rational problem solving (Saltelli and Giampietro, 2017, p. 63). What is truly missing, at least according to Cairney (2016), is a nuanced understanding of evidence as it relates to policy theory.

This chapter addresses this gap by following the admonition of behavioural public administration about the missing micro-foundations of decision-making (Grimmelikhuijsen et al., 2017; Sanders, Snijders and Hallsworth, 2018). The chapter seeks to reignite the interest on the 'psychology of policymaking' by examining the cognitive dimensions of evidence use (Cairney, 2016). In doing so, it harps back at the fundamental discourse started by the likes of Herbert Simon and Harold Lasswell at the birth of policy sciences about the role of scientific evidence in an otherwise messy policy process by offering a model of evidence use grounded on a simplified understanding of two important cognitive processes: intuition and reasoning. It argues that the probability of using research evidence depends on cognitive process activated. Reasoning is best suited to analyse scientific evidence while intuition relies on one's own tacit knowledge. This simplified conception of the cognitive use of evidence is then related with policy capacity in order to forward an understanding of how to improve integration of evidence and knowledge in policymaking. The chapter concludes with some implication on how to conduct further research on evidence and knowledge utilisation grounded a better understanding of its cognitive dimensions.

2 RATIONALITY AND HUMAN COGNITION IN POLICYMAKING

The study of public policy has long been concerned with maximising the use of human cognition to solve pressing societal problems. In envisioning the professional field of policy sciences, Harold Lasswell highlighted the importance of possessing both the knowledge *of* and knowledge *in* the policy process to elicit and give "effect to all the rationality of which individuals and groups are capable

at any given time" (Lasswell, 1970, p. 13). Modern governments are expected to introduce policies through a process where "the end, the means, and the secondary results are all rationally taken into account and weighed" (Weber, 1968, p. 26). A cadre of professional analysts motivated to find the best solutions for the most pressing policy problems, particularly for developing countries, should be trained and bestowed the knowledge of policy sciences (Lasswell, 1965). The policy sciences was envisioned to be fundamentally concerned with fostering instrumental rationality in how the government conducts its affairs (Dunn, 2019).

Such conception of a knowledge-driven problem-solving process set off a debate about the extent to which the generation and deployment of knowledge can truly lead to rational decisions. On one end, the Lasswellian notion of public policymaking approaches problem-solving through a systematic way of putting together governmental instrument to achieve certain goals (Dunn, 2018; Howlett, 2010; Linder and Peters, 1987). Following the traditions of policy analysis and policy design, the fundamental concern is to drive instrumental rationality through a careful generation and assessment of policy alternative and selection of the best solution to address a well-defined policy problem (Howlett, Ramesh and Perl, 1995; Weimer and Vining, 2011). This techno-rational assessment of public policy approaches it from a normative angle, that is, the identification of the best and most effective instrument should be based on a systematic assessment of evidence about each of the option's ability to achieve the goal.

At the other end of the debate are scholars who argue for the almost impossibility of achieving instrumental rationality. Rittel and Webber (1973) earlier lamented about how rational 'cognitive styles' have proven to be insufficient in truly understanding wicked social issues confronting government planners. Recognising the complexity of structuring problems, Herbert Simon developed the notion of bounded rationality to better elaborate the cognitive processes involved in problem solving and the constraints to fully processing information to make rational decisions about ill-structured problems (Fernandes and Simon, 1999; Simon, 1967; 1997). Because of limitations to time and resources, Lindblom (1959) argued that most policy-makers are just muddling through in the assessment of policy alternatives, resulting in policy choices that are only marginal to the status quo. Such arguments identify the limits of human cognition to squarely face the complicated and often conflict-laden environment as the main source of sub-optimal policy outcomes.

This broader debate about the limits of human cognition for effective policymaking is central to what the EBP movement is trying to change. Given bounded rationality, evidence may exist but may be difficult to understand or too complex to be used for decision-making. Tools such as meta-analysis and systematic reviews form a key part of facilitating evidence use by a temporally

and cognitively constrained decision-maker (Young et al., 2002). While EBP emphasised the importance of simplifying the highly evolving and increasingly complex evidentiary landscape of policymaking, its view of human cognition is restricted to instrumental reasoning as the idealised cognitive process. According to Dewey (1938, p. 17), "rationality is an affair of the relation of means and consequences… Rationality as an abstract conception is precisely the generalised idea of the means-consequence relation as such". All forms of reasoning, at least according to this pragmatist view of policymaking, are about finding the best means to a given end (Garrison, 1999). The abductive search for evidence and reason may enable the realisation of such ends (Dunn, 2019). However, marshalling evidence and reason has been narrowly defined as evidence derived from objective scientific research (Cairney, 2016). This is a form of what Parkhurst (2016) calls issue bias, where the focus on technical concerns subordinated other relevant issues that may be more political or operational in nature. EBP particularly finds individual practical wisdom as problematic because individuals are constrained about what they know and are subjected to emotions that may bias their decisions.

3 A COGNITIVE MODEL OF KNOWLEDGE USE

Further works on bounded rationality, particularly from cognitive psychology, have made progress in better elaborating on why human cognition remained so constrained in making decisions. The theory of human cognition that lies at the heart of these scholarly works distinguishes the two systems of human cognition: reasoning and intuition (Kahneman, 2003; Stanovich, 1999; Stanovich and West, 2000). Intuition or System 1 cognition is fast, automatic and associative. Intuition, at least as it relates to decision-making, can be defined as "affectively charged judgments that arise through rapid, nonconscious, and holistic association" (Dane and Pratt, 2007, p. 40). It is associative as it links disparate elements and make sense of patterns based on existing knowledge (Epstein, 2010; Kahneman, 2003). Intuitive judgements, which are the observable outcomes of intuition, are important to make quick and almost automatic decision that governs our behaviour in much of our daily life (Bargh and Chartrand, 1999). System 1 processes generate unconscious impressions of objects of perceptions and are often linked to biological impulses derived from human evolution.

On the other hand, reasoning or System 2 operations are slow to generate judgments that are deliberative and conscious. Rational decision-making models are based on System 2 processes that are often conceived as the primary means of developing ideas and analysing trade-offs (Kahneman, 2003). The dual systems theory of human cognition suggests that the limitations to rationality earlier noted can be linked to the tendency to make quick judgement through intuition. Kahneman and Frederick (2002) argued that System 2 governs the judgments made through

intuition but it is often done rather poorly, inevitably making erroneous judgments. Conditions within the policy environment such as limited information, time and complex stimulants require quick decisions, making the activation of the slower and deliberative reasoning very challenging.

Much of the models of government decision-making privileges reasoning as the ideal cognitive process as it demands drawing from scientific knowledge. While intuition is often triggered unconsciously, it also depends on some form of knowledge. In his two-minds recasting of the dual systems theory, Evans (2010, p. 316) posited that System 1 processes draw on experiential knowledge while System 2 processes require manipulation of "explicit representations through working memory". Both systems promote instrumental rationality – employing rationality to achieve some goals – but they differ in the temporality of goals. Intuition can generate effective judgments when personal experience and logic are used to satisfy immediate concerns and achieve short-term goals with means found from experience. Reasoning seeks to anticipate the future and involves the generation and analysis of alternatives based on deliberate processing of information. Reasoning provides a wider latitude for the use of scientific knowledge because of its inherent deliberative nature.

However, what EBP failed to recognise is the interdependence between system 1 and 2 processes in generating the observable outcome of cognition: judgments. One could conceive intuition as a precursor to reasoning (Myers, 2004; Shapiro and Spence, 1997). In fact, as Simon (1987) had earlier suggested, it is rare for decision-makers to rely on one system alone and most of the time, good decisions are based on a mix of intuition and rational processes. Accessibility, or the "ease with which particular mental contents come to mind" (Kahneman, 2003, p. 452), is central to understanding the relationships between intuition and reasoning. As a default, intuition is easily accessible because the mind computes automatically a representation set of the object observed. Kahneman (2003, p. 453) noted that the "the acquisition of skill selectively increases the accessibility of useful responses and of productive ways to organise information". As such, the capacity to draw in reasoning can be trained and different forms intuitive judgments that combine intuition and reasoning can be made depending on the extent to which intuition and reasoning are triggered. Even without system 2 endorsement, intuitive judgments are made only with system 1. Intuitive judgments can also be temporarily made but this could be adjusted by system 2 as information becomes available. Deliberative judgements are made when system 1 processes are not accessible or when system 2 corrects a wrong judgment by system 1. In this interactive cognitive model of decision-making, both scientific and experiential knowledge are used to make the best judgments given environmental constraints.

4 EVIDENCE AS POLICY KNOWLEDGE

The dual-process theory of human cognition discussed above is largely consistent with the notion of 'evidence-informed policy'. Research on EBP is traditionally approached from two camps: two communities theory and the non-instrumental use of research (Oliver, Lorenc and Innvær, 2014). In the two communities theory, the separate professional development of academics and policymakers set them apart and encourage divergent views about what evidence should be and can be used for policymaking (Caplan, 1979). Carol Weiss's (1979) typology of research utilisation suggests research's different role in decision-making beyond its canonical instrumental use. These two theories are important in the discussions about the paradox of knowledge utilisation where the widespread availability of knowledge does seem to not guarantee their utilisation. Many contemporary work on EBP holds the assumption that a policy driven largely by scientific knowledge is superior which contradicts Weiss' (1979) argument that evidence that are used more indirectly, as in the case of the enlightenment model, could offer more effective solutions. The interaction between bureaucratic expertise and scientific knowledge once again become central in the explanation of (the lack of) knowledge utilisation.

The thinking that intuition, particularly expert intuition, can be used alongside scientific knowledge to make the most effective decisions underlies this largely indirect view of knowledge use. Within evidence-based medicine, clinical expertise or 'knowledge in practice', scientific evidence and patient's expectations and preferences constitute the core elements that must be integrated into everyday practice (Gabbay and Le May, 2004; Rycroft-Malone et al., 2004). In the same way doctors use their own professional knowledge to make judgments, policymakers can rely on the wealth of managerial and policy experience to overcome the challenges posed by the hectic and messy context of managerial work that demands them to make decisions on the fly (Mintzberg, 1971). Their busy schedules make public managers, as in the case of many Brazilian middle managers, unable to truly collect and process scientific evidence, which pressures them to rely on their own managerial know-how to make decisions (Saguin and Palotti, 2020). Thus, as Schön (1984) had earlier argued, tacit knowledge is a critical element of being a professional and should form part of the development of a 'public service profession' (Perry, 2018). The inherent uncertainty and ambiguity in public policymaking requires policy professionals to possess "some form of expertise that the community defers to" (Rourke, 1979, p. 541).

Although EBP recognises this interaction between intuition and reasoning through the interaction of expertise and scientific research, much of the EBP literature conflate knowledge and evidence. EBP considers evidence only as empirical evidence or "evidence claims [that] report facts about the world" (Cartwright and Hardie, 2012, p. 7). But factual representation of the world goes beyond mere

results of scientific studies. As Cartwright and Hardie (2012) added further, evidence includes causal stories and supporting factors to build a convincing argument about how a policy can work as intended. This is partially the reason for the conceptual confusion evidence in the EBP context as a causal argument is a form a specific of policy knowledge. Policy knowledge is broadly defined as "the body of human knowledge available to assist policy makers in their understanding of the causes and consequences of the outputs of government and the subsequent society impact" (Webber, 1991, p. 11). Policy knowledge and empirical evidence becomes inextricably linked with reasoning because such a cognitive processes allows for associative elements that policymaking demands. One needs to make the connections between specific governmental action with societal outcomes that may not exactly be intuitive. Knowledge from scientific research and professional experience are crucial sources of information about past performance of similar actions and how it may materialise in the future for other similar endeavours.

EBP's conflation of evidence and knowledge dismisses the critiques received by the techno-rational approach to policy analysis, particularly from democratic theorists. These scholars have long lamented the tendency of reliance on scientific knowledge to undermine democratic values (Dryzek, 1989; Jenkins-Smith, 1988). Solutions identified by evidence as the best may not necessarily be legitimate and effective given the prevailing policy context. Second-best solutions may be more appropriate in solving vexing societal problems when citizens were engaged in the analysis. This process folds in the concerns for instrumental rationality along with democratic rationality that addresses underlying issues of political legitimacy of many modern governments. The role of policy analysts or those traditionally perceived to be responsible for marshalling policy evidence should take the form of 'interpretive mediator' of knowledge and practical considerations on the ground (Fischer, 1993). This goes against the exhortation of Lasswell (1965) for policy scientists to possess professional knowledge of and knowledge for policy process because, as many of these scholars argued, ineffective policies emerge because of the widening gap in the preferences between the bureaucratic experts and the citizens who are the supposed beneficiaries of the policy. DeLeon (1992, p. 127) suggests for the policy analysts to "devise and actively practice ways", such as policy polling and public hearing, "to recruit and include citizen's personal views into the policy formulation process".

The participatory turn in public policy challenged expert knowledge's claim to epistemic superiority. Governments, particularly from developing countries, actively collect information from other political actors thought to be crucial in the design and implementation of policies (Saguin, Ramesh and Howlett, 2018). Participatory processes can be used to improve not only the technical components (or the causal theory) of the policy but also the value judgments by the participants (Stewart,

Dennis and Ely, 1984). Citizen-derived valuation of policies can also enhance substantive elements of policy as well as improve its qualitative features (Walters, Aydelotte and Miller, 2000). Participation and deliberation can generate democratic rationality by generating a broad-based understanding of knowledge not just among individuals who are involved in the process but also in terms of collective judgments. Embedding citizens into government decision-making acknowledges the potential of citizens to "contribute policy-relevant information, learn to judge the results of technical analysis, and engage in debate about what to do" (Stivers, 2010, p. 256). Democratic knowledge, as Sadiki (2015, p. 706) emphasised, blurs the distinction between "intuitive/spiritual, intellectual and practical know-how" and favours "a holistic approach". Participatory processes have thus given rise to a different form of knowledge that must be incorporated in decision-making. Public knowledge or policy knowledge derived from public deliberative processes between actors can be seen as an alternative form of evidence that can be used in policymaking.

Such distinction between scientific, expert/experiential and democratic knowledge is consistent with the Aristotelian categories of knowledge. In Flyvbjerg's (2001) elaboration of these knowledge types, distinction is made between episteme (science), techne (art) and phronesis (practical wisdom). Epistemic knowledge follows the ontology of natural sciences and "concerns universals and the production of knowledge which is invariable in time and space, and which is achieved with the aid of analytical rationality" (Flyvbjerg, 2001, p. 54-55). Policy knowledge that is epistemic holds claim about causal linkages between an action and a consequence. For instance, it is widely accepted that requiring seat belts would significantly reduce deaths from road accidents. Technical knowledge refers to the knowledge gained from the practice of the art and craft of policy work. As it is gained from actual professional expertise, it can also be referred to as tacit knowledge, which Thompson (2003, p. 121) describes as the knowledge "which cannot be explicitly codified but which rests very much in implicit personal or institutional practices often associated with craft like skills, awareness of reputations, hands on techniques, etc". Lastly, phronetic knowledge is a "sense of the ethically practical rather than a kind of science" (Flyvbjerg, 2001, p. 57). Phronetic knowledge is akin to Lindblom and Cohen's ordinary knowledge that is based on "common sense, casual empiricism, or thoughtful speculation and analysis" (Lindblom and Cohen, 1979, p. 12). As Tenbensel (2006) would argue, "phronetic knowledge claims… [involves] problem definition" and is about strategic decision (where are we going?) and normative action (what should be done?). It is fundamentally about "what stakeholders are supposed to bring to…governance" by drawing on their own experiences and practical knowledge (Linke and Jentoft, 2014, p. 155). Ultimately, Flyvberg suggested that phronetic knowledge is the most important in policymaking as it is most sensitive to context and local power relations, although integration of the knowledge triad

remains key in finding the second-best policy designs. This integration of scientific evidence with framing and persuasion can address uncertainty (lack of information) and ambiguity (unclear preference), potentially ensuring the effectiveness of the chosen policy solution (Cairney, Oliver and Wellstead, 2016).

As table 1 would show, each of these types of knowledge can be linked with a specific causal claim and type of evidence. Evidence is fundamentally a form of policy knowledge that is useful in breaking down the policy problem and appraising the costs and benefits of the solutions; but it is equally vital in reigning in theoretical and conceptual perspectives of social science into policymaking (Larsen, 1980). From a knowledge perspective, evidence that can be marshalled into policymaking will depend largely on the type of policy knowledge involved (Tenbensel, 2006). If the decision-making is based largely on epistemic knowledge, scientific evidence will most likely be used through backward reasoning. A hypothesis is made about a certain causal claim and this is tested through observations. Expert intuition forms only a minimal part but is used to approximate the validity of the evidence. Decision-making that depends largely on tacit knowledge would require evidence derived from professional experience and expertise. It has been found that the largely unarticulated form of knowledge is crucial in navigating through the complex web of bureaucratic layers in pushing for genuine administrative reforms in China (Chan and Chow, 2007). Although experience is a necessary condition for gaining expertise, it is not a sufficient condition to say whether one has expert evidence that can be used. Tacit knowledge can be rational when it adopts forward, inductive reasoning that generalises from a case to a known established hypothesis. Lastly, phronetic knowledge can be derived from lay evidence through public engagement. It pertains to the 'grass-roots', vernacular knowledge that is often seen as the antithetical to expert knowledge. But phronetic knowledge can also be rational through conditional reasoning (*if p then q*). Given the affective nature of phronesis, knowledge derived from public engagement requires evidence that allows generalisation of a policymakers conditional probability strategies (Oaksford and Chater, 2003).

TABLE 1
Types of policy knowledge

Type of policy knowledge	Characteristic of knowledge claim	Type of evidence	Reasoning strategies	Role of expert intuition
Epistemic (episteme)	Universalistic, causal	Scientific or research evidence	Backward reasoning	Approximation of knowledge
Tacit (techne)	Technical, occupation-specific	Professional expertise	Forward reasoning	Holistic, associative
Phronetic (phronesis)	Context-dependent, practical wisdom, problem definition	Lay evidence	Conditional reasoning	Affective

Source: Tenbensel (2006).
Author's elaboration.

5 KNOWLEDGE UTILISATION MODELS AND POLICY CAPACITY

The different forms of knowledge considered by the policymaker point to a mul-titude of purposes beyond the instrumental use of knowledge that the rationalist tradition of public policy suggests. Caplan (1979) earlier cited the instrumental use of knowledge tend to be applied to micro-level problems that pertain to run-of-the-mill, routine policy problems while conceptual uses of policy knowledge apply to macro-level problems that require empirically-grounded substantive solutions. The diversity of knowledge uses is a core aspect of policy learning and advocacy coalitions as it sets the stage not only for technical analysis but also for political debates about the problem and the solution (Sabatier, 1987; 1988). The vibrancy of the political debates can also foster the symbolic use of knowledge, which can be classified either as legitimation or substantiation (Boswell, 2008). Legitimation function pertains to boosting the credibility of the claims made about the assess-ment of the scope and scale of the problem, criteria used in appraisal and solutions proposed (Boswell, 2009). The use of knowledge this way is perceived to be more transparent because it makes known the basis of every decisions made (Hertin et al., 2009). Knowledge can also be used to substantiate positions and preferences not only of the client but also of experts themselves. However, it remains unclear when policymakers actually require these types of knowledge. This has motivated scholars to posit the paradox of non-utilisation of knowledge, that is, despite the availability of various sources of knowledge, policymakers do not use them.

Carol Weiss (1979) suggested that the differential use of research evidence points to a variety of interaction between basic research and public policy. The knowledge-driven model, generally found in the physical sciences, occurs when basic research is directly applied in public policies. It assumes that epistemic knowledge will solely determine the action to be taken. The problem-solving model suggests an evidence-seeking behaviour meant to determine the best solutions to a given issue that warrants government attention. This is what the pragmatic approach to policy sciences advocates in terms of instrumental rationality. The interactive model is characterised by a "disorderly set of interconnections and back-and-forthness that defies neat diagrams" (Weiss, 1979, p. 428). A host of different actors are consulted and used as sources of knowledge beside researches because of the absence of convergent evidence. The political model is about the use of research evidence to support a pre-conceived belief and interest in order to "neutralise opponents, convince waverers and bolster supporters" (op. cit., p. 429). It is the most pejorative use of scientific evidence that is often widely available and subjected to different interpretations. The tactical model is not concerned with the substantive elements of the research findings. Knowledge here is not used to influence policymaking but, in some ways, to legitimise action or inaction through the conduct of research. The enlightenment model brings social science research

orientation at the heart of government affairs. Under this model, Weiss (1979, p. 430) argued that the research "sensitises decision-makers to new issues and helps turn what were non-problems into problems". Arguably, Weiss favoured the enlightenment model because "without any special effort, truth will triumph" (idem, ibidem) because research diffuses without obstruction in the government.

From a cognitive angle, these models can be conceived as schema or cognitive structure. A schema is "a cognitive structure that represents knowledge about a concept or type of stimulus, including its attributes and the relations among those attributes" (Fiske and Taylor, 1991). Individuals hold their own pre-existing schemas that allow them to relate to organisations and other individuals differently (Larson, 1994). Herbert Simon (1958) treated decision-making as schema to better understand how government conducts its business. The models that Weiss identified are essentially influenced by one's own schema because it is a theory or a preconception of the world (Fiske, 1994). Schemas "help the individual to construct meaning out of the environment" (Larson, 1994, p. 22) as well as guide one's reaction to events, and thus pay particular focus on the relationship between intuition and reasoning and as this relationship interfaces with evidence. As Fiske (1994, p. 166) had argued, "the normal, default option is to go with the schema, the category, the preconception, the theory". Utilisation of data or scientific knowledge through reasoning would thus require awareness of the 'diagnosticity of the data' and one's motivation for data-driven, piecemeal processes, Fiske (1994, p. 166) added.

The schemas will differ across domains depending on the policy functions needed to be performed. These functions, as Wu, Ramesh and Howlett (2015) suggested in their discussion about policy capacity, refer to managerial, political/relational and analytical functions that are expected of a modern government (Saguin and Ramesh, 2020). At the level of organisation, these functions are consistent with organisational processes that correspond to specific behavioural aspects of administration which are information processing, affective bonding and action generation (Beyer and Trice, 1982). Depending on the configuration of functions of the sector and the salience of each organisation processes, the schema would represent the ability of the policymaker to access intuition and reasoning as the circumstance would allow.

Two types of schemas are identified by Dane and Pratt (2007) that relate specifically to decision-making: heuristic schema and expert schema. A cognitive structure that often privileges heuristics or mental shortcuts tend to rely more on intuition or theory-driven thinking. Heuristics simplify complex concepts into its constituent elements based on critical, rather than comprehensive, information (Tversky and Kahneman, 1974). Expert schema, on the other hand, brings in expertise as the ability to match patterns based previously encoded data, triggered

by an external stimuli (Chase and Simon, 1973; Simon, 1996). The likelihood of these schemas to be accessed depend on one's domain, training and capacity as well as external stimulus. In other words, the dominant schema for evidence use will be different across policy sectors and across organisational types (Head, 2016).

As Dane and Pratt (2007) further elaborated, macro-variables can determine what kind of decision-making schema an individual can take, which in turn will affect the type of evidence that will be used and its effectiveness (figure 1). A policymaker's schema will intermediate the relationship between these variables with evidence and knowledge use. Schema as a pre-existing cognitive construct is shaped by a set of individual, organisational and environmental factors that can be collectively understood as policy capacity. Policy capacity refers to the necessary skills and resources to perform policy function that exists at the individual, organisational and systemic levels (Wu, Ramesh and Howlett, 2015). Policy capacity can be viewed both as stock that exists at each level and a flow that influences the stock of other levels (Saguin, Tan and Goyal, 2018). One's schema would determine the nature of evidence and knowledge use as a reaction to a stimuli and is contingent upon one's policy capacities.

FIGURE 1

Relationship between policy capacity and utilisation of evidence
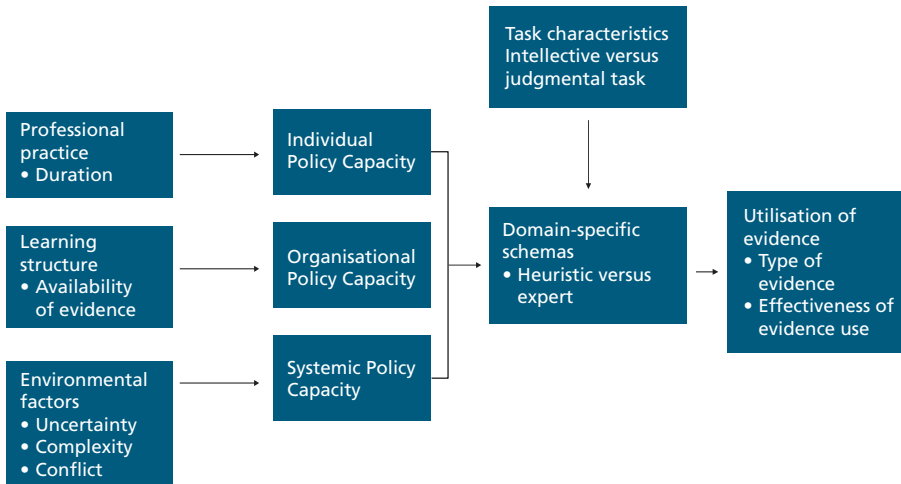
Author's elaboration.

Some stimuli that are external to policy capacity such as new mandates, policy changes, demographic shifts can characterise task characteristics. A stimulus, that can be envisioned as largely exogenous to the decision to be made, can pose different degrees of structuring of a problem. As earlier discussed, policymaking often involves determining which evidence can be used to solve wicked or ill-structured

problems but there are government agencies that are concerned with tame or structured problems. For such kind of problems, the task of evidence use is supposed to be intellective that requires "definite objective criterion of success within the definitions, rules, operations, and relationships of a particular conceptual system" (Laughlin, 1980, p. 128). On the other hand, wicked problems would involve judgmental tasks that are inherently "political, ethical, aesthetic, or behavioural" in nature "for which there is no objective criterion or demonstrable solution" (idem, ibidem). The cognitive nature of evidence use may differ according to the nature of tasks that permeates a certain sector or organisation. Judgmental tasks related to complex problems would require more intuition and thus will be characterised by greater use of professional expertise and lay evidence than scientific research. Intellective tasks related to tame problem would entail greater use of reasoning and thus will usually require epistemic knowledge.

The earlier discussion about expertise points to the importance of professional practice and its duration (or individual policy capacity) in determining what form of evidence will be used. Expert intuition can be effective once a significant amount (usually ten years) of problem-solving experience is accumulated by a policy workers (Chase and Simon, 1973; Khatri and Ng, 2000). Holding other things constant, experienced public managers that hold generalist expertise will most likely rely on tacit knowledge and use past professional experience as evidence (Howlett and Wellstead, 2011). Individuals with domain knowledge and appreciation of what evidence should be evaluated like doctors or lawyers have higher levels of policy analytical capacity and will most likely use scientific evidence. Policy workers whose function require higher levels of political capacity will most likely rely on lay evidence, particularly as most of their tasks would be characterised as judgmental.

A learning structure or an environment that fosters feedback and reflexivity is largely a function of organisational capacity. Organisational policy capacity refers to "all assets, capabilities, organisational firm attributes, information, knowledge" (Barney, 1991, p. 101; Daft, 1983) that can be used to foster better use of evidence. If scientific evidence is available and organisational commitment exists to ensure that only scientific evidence is used, most likely scientific evidence will be used more than tacit or lay evidence. This is the case for high levels of organisational analytical capacity. When an organisation requires managerial expertise of their policy workers, tacit knowledge from managers will be predominantly used. Lastly, politically oriented organisations would most likely use ordinary knowledge as it tends to build on public engagement and political management for its legitimacy.

Abstract environmental factors such as complexity, conflict and uncertainty feed into the likelihood of the problem being unstructured. However, the existence

of systemic level interventions can reduce uncertainty and complexity. For Christopher Hood, systemic policy capacity is fundamentally about authority or the "possession of legal or official power" (Hood, 1983, p. 201). But such power can be used to control, exhort and even suggest evidence use. Systemic policy capacity roughly pertains to the existence of an enabling environment that allows for the differentiated use of evidence according to context and case. For example, as it relates to health policy, centralised political systems have less space for pluralised discussion through evidence discourse and rely more on professional expertise (Klein, 1990). The absence of independent source of research evidence like think tanks or universities can also encourage governments to use evidence more symbolically or rely on ordinary knowledge in order to make decisions (Liverani, Hawkins and Parkhurst, 2013). The existence of a competitive and diversified marketplace of ideas can truly bolster the supply (and in turn, demand) of available scientific evidence (Anderson, 1996; Boston, 1994; Tiernan, 2011). These systemic level interventions suggest greater policy capacity to perform system-level functions that shapes how and what kind of evidence will be used.

The relationships highlighted in figure 1 only provides an indicative directionality in the complex interdependencies between the different levels of policy capacity, schema and evidence use. Evidence use and its effectiveness in policymaking is triggered by certain exogenous task requirements that may be intellective or judgmental. Task characteristics determine the intensity of the cognitive tasks required but do not purely determine the nature of evidence use. One's decision-making schema would determine the cognitive processes that will be triggered and the ability to perform a certain tasks will be based on the set of policy capacity that exists. Evidence use is thus not just a function of individual-level characteristics but macro-variables shape the likelihood of evidence that can be used in terms of the cognitive process that will be triggered. Such relationships would be difficult to predict as concrete hypothesis but it could be expected that they will drive the difference across policy domains, organisations and even individuals in the use of evidence.

6 CONCLUDING REMARKS

This chapter sought to provide a cognitive approach to understanding the paradox of knowledge utilisation and the crises that beset the EBP movement. It argues that research on the subject should be motivated in understanding why certain knowledge are used, by whom and it what context. It draws on the recent literature on policy sciences and behavioural public policy to suggest factors that shape knowledge utilisation from the perspective of policy capacity (Wu, Ramesh and Howlett, 2015). More specifically, in order to understand the cognitive nature of evidence research must examine individual factors that may affect the likelihood of a policymaker to use what type of evidence (micro-level), organisational

dimensions that shape how the demand and supply of policy knowledge interact (meso-level) and the characteristics of the policy advisory system that determines the 'supply' of policy knowledge (macro-level). These levels of policy capacity militate the accessibility of intuition and reasoning, which determines the nature of evidence that will be used in particular policy sector or organisation.

In bringing together the literature on policy capacity and cognitive science, the chapter hopes to guide future research on evidence use in three ways. First, future research must examine the interaction of the different evidence and how the conflicting ontological origins of each evidence are grappled with and resolved by policy workers. The idea of knowledge integration is seen to be the most ideal type of research-policy interface as suggested various scholars like Weiss, Boston and Flyvberg. Second, the relationship between cognitive processes of intuition and reasoning with the use of evidence must be understood more systematically. Survey research can inform the different factors that influence the use of evidence by policy-makers but experimental methods can potentially unlock micro-perspective of individual behaviour, attitudes and cognitive process that link evidence use with policy environment (James, Jilke and van Ryzin, 2017). Lastly, the propositions identified briefly in this chapter must be tested to identify whether capacity can shape the likelihood of using research evidence vis-à-vis other forms of evidence. Attention must be given to the degree to which individual, organisational and systemic capacities exist to perform managerial, analytical and political functions (Mukherjee and Bali, 2019; Ramesh, Howlett and Saguin, 2016; Ramesh et al., 2016). Whether or not the capacity for utilisation of different forms of evidence or the ability to access reasoning can truly be developed should also be a matter of future research. The cognitive approaches to public policy and administration possess a promising space in locating the role of evidence (in whatever form) within the messy world of policymaking. It is incumbent upon for future research to examine systematically whether there is truly a merit to reinvigorating the desire to better understand human cognition in policy research.

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