

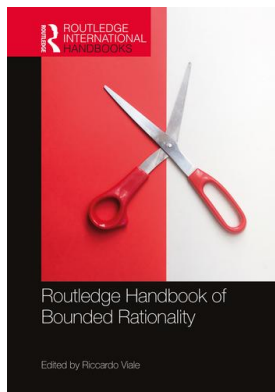
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## **Routledge Handbook of Bounded Rationality**

Riccardo Viale

### **Bounded rationality in political science**

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BOUNDED RATIONALITY  
IN POLITICAL SCIENCE*Zachary A. McGee, Brooke N. Shannon, and Bryan D. Jones***Bounded rationality's origins and principles**

The father of bounded rationality, Nobel Prize-winner Herbert A. Simon was principally a political scientist with a special focus on public administration. Simon saw his scientific career as being motivated by the development of two big ideas, both originally developed in *Administrative Behavior*, bounded rationality and organizational identification<sup>1</sup> (Simon 1996). We will discuss each idea in turn and then show how it applies to different literatures in political and policy sciences. *Administrative Behavior*, a version of Simon's doctoral dissertation at the University of Chicago, argued that organizations need to be understood in terms of their decision-making processes (Simon 1945). Put another way, Simon thought the limits of cognitive processing must apply to individuals within organizations and those effects would carry over into how organizations operate. This book essentially combined bounded rationality and the study of organizations to explore the processes that determine outputs similar to the study of rational choices and decision-making processes at the individual level (Jones 1997; Ostrom 1998; Selten 2001).

Bounded rationality is, in part, based on the limitations that all actors have in cognitive processing. What does Simon mean when he refers to limitations of cognitive processing? A full exposition is beyond the scope of this chapter,<sup>2</sup> but central to his explanation are the failure to have perfect knowledge, imprecision in anticipation of consequences, and emotions related to imagined consequences, all of which contribute to our shortcomings as individual utility maximizers (Simon 1945). Limitations in cognitive processing explain the bounds of the individual's ability to process the overabundance of information, left to them to distill. Bounded rationality is the relationship between the individual's information processing ability, complicated by ever-present limitations and the complexity of the problems faced (Bendor 2003).

Complexity alone does not limit individual information processing in bounded rationality. The uncertainty of the decision-making environment plays an important role as well. Such uncertainty depends, in part, on whether decisions are being made in so-called "small world" or "large world" environments (Savage 1954). Consider a game of chess, the decision for which piece to move next and to where may be complex but have a finite and knowable number of variables. This describes a small world where choices may be risky (i.e., reliably assigned a probability) but not particularly uncertain (Knight 1921; Binmore 2006). The political world, and

the policy process, are large worlds. These so-called large worlds have significant uncertainty because many alternatives are unknowns and, in fact, unknowable. Therefore, decision making is not only a problem of computational difficulty and risk, as in a small-world chess game, but also has the added caveat that some outcomes will never be assessed. We will return to these principles shortly.

Bounded rationality challenges the central set of assumptions outlined by comprehensive rationality, also known as rational choice theory, which is the standard for formal models of politics. Rational choice hinges on behaviors of the individual, primarily focusing on vote choice in elections and legislatures. The behavioral theory of comprehensive rationality has a durable tradition in political science, conceptualizing individuals as rational, calculating actors who avail themselves of the entirety of available information regarding alternatives. Bounded rationality challenges these assumptions, fundamentally the infinite abilities of humans to recognize and process all information available in their environment.

Realistically, no human has the boundless ability to process information as a computer does. Human rationality is bounded both by limited cognitive abilities but also by the brain's limited size and speed, "but it can often function well by making coherence judgments rather than overextending itself by making too many deductions and calculations" (Thagard 2018, p. 8). Due to biological constraints as well as the complex environment humans make decisions in, humans can exclusively focus attention on only a small number of issues at once. For these reasons, decisions influenced by a complicated, or uncertain, environment are unable to meet the criteria for rationality under rational choice. The implication for political decisions is that an individual's ability to make rational responses to their environment can fail, particularly at critical moments and with complicated problems. This mismatch characterizes bounded rationality (Simon 1996; Jones 1999).

### **Bounded rationality's influence on political science**

In political science, there are two main branches of research utilizing bounded rationality (Bendor 2003). We focus here on the first branch, which retains Simon's name and his core argument that cognitive limitations only show through in a person's decision making when the problem they are handling is sufficiently difficult.<sup>3</sup> That is, we can expect people to be able to solve simple problems in limited choice environments rationally, but beyond simple choice environments, our decision-making is impaired. The Simonian branch of bounded rationality is also heavily influenced by Charles Lindblom's "The Science of Muddling Through" (1959), imagining decision making as a set of successive limited approximations to problems rather than a comprehensive analysis of alternatives (Bendor 2015).

As time went on, bounded rationality gained acceptance in political science, especially as the discipline trended increasingly toward empirical work (Jones 1999). Lindblom (1959) builds on Simon's theory by characterizing decision making in policy formulation as a metaphorical tree's branches and roots. Comprehensive rationality takes a root approach; solving complex problems, formulating policy, or pulling a tree up from the root requires comprehensive action. The means to achieve any end must include all possible alternatives, isolating the means is necessary to make a rational decision toward an end. In this way, "analysis for the root method is comprehensive; every important relevant factor is taken into account" (Lindblom 1959). As one may imagine, creation or destruction by this method is drastic and not necessarily an incremental process.

Bounded rationality, on the other hand, assumes the branch method, for what Lindblom calls successive limited comparisons. Like a tree's branches building out from the center structure,

branch analysis of policy formation improves the central problem in small steps, adding to an initial pre-existing foundation. As it relates to the policy process, rationality is bounded by a number of limitations, including cognitive processes and time constraints. For this reason, policy processes most often subscribe to the branch method, as policy making builds on itself in an endless cycle of formulating new policies and improving existing ones. As Simon famously argued, “it is impossible for the behavior of a single, isolated individual to reach any high degrees of rationality” (1997 [1945]), p. 92). Contrasted with comprehensive rationality as root analysis which relies heavily on its own theoretical framework and builds from the past only as embodied in the theory (Lindblom 1959), bounded rationality establishes new foundations for rationality by including institutional constraints, limited processing capability, and values. As Wildavsky (1964) showed, boundedly rational decision making led to incremental policy changes.

### **An institutional bridge between the individual and organizations**

An institutional focus provides the link between Simon’s emphasis on human nature and organization theory. The term “institution” refers to the rules that govern different kinds of organizations (and the norms that solidify them), as well as the legitimacy given to them. This legitimacy is invisible and tangible first through shared understanding and meaning, and more importantly through policy (Ostrom 1998; 2009). Political scientist Elinor Ostrom argued for a bounded rationality frame on institutional political science because it better reflects realistic politics. For example, in situations where an individual’s preferences are not maximized but must nevertheless reach an outcome, rational choice predicts no action toward cooperation. Although action is not predicted, it regularly occurs; rational choice predictions fall flat here.

Institutions are able to bridge the divide between schools of thought in bounded rationality because they (exist) in the political environment and hold the norms and formal rules of action (Ostrom 2009). Bounded rationality adapts its rational choice predecessor to include the environment in which individuals make decisions, comprised of its institutions. Simon (1945) and Lindblom (1959) point to the relative success of the majority to handle simple tasks, and note that cognitive limitations show through for difficult situations. For simple problems, most make decisions rationally. Institutions support individuals’ capacities to do better in terms of rational decision making, and minimize mistakes made with even simpler problems, and in this way bridge the two schools of thought in bounded rationality.

While much of the understanding of bounded rationality is rooted in individual decision-making processes, Simon’s original target was organizational behavior. We argue for an understanding of institutions as a connection between the two schools of thought in bounded rationality because institutions moderate and inform individuals’ behavior, to help them solve problems.

Understanding the institutional connection between the individual and organization helps to provide a more robust understanding of choice. Institutions exist to facilitate successes that would be impossible by individuals acting alone. In the more pessimistic view of bounded rationality, Tversky and Kahneman develop a view of actors that shows a dependence on mental shortcuts, or heuristics, that allow lower-information actors to behave like actors who have more knowledge of the process and alternatives. The role of heuristics in political decision making is to help citizens make up for a lack of information with mental shortcuts.

For the general public, heuristics help individuals make rational decisions in vote choice in elections. For policy makers, heuristics seek to benefit leaders in developing policy solutions

to complex problems. Tversky and Kahneman (1974) point to the mistakes some make even in simple tasks and the prevalence of heuristics and bias in decision making for even highly knowledgeable individuals, and the universal dependence on mental shortcuts or heuristics, to help even low-information individuals make rational decisions (Gigerenzer et al. 1999; Boyd and Richerson 2001; Tversky and Kahneman 1974; Sniderman, Brody, and Tetlock 1991; Cherniak, Chapter 24 in this volume). We argue for a refocus on the role institutions play in political decision-making in part due to Simon's emphasis on one's environment during the decision-making process. This refocus further underlines the decision-making processes of both institutions and organizations in human nature.

Tversky and Kahneman show the disadvantages of bounded rationality. Heuristics are used by nearly everyone in their experiments, and their use is not restricted to low-information laymen (Tversky and Kahneman 1974, p. 1130). Intuitive thinking, a distinctive feature of bounded rationality, leads nearly all individuals to fail in rational decision making. These experiments conducted by Tversky and Kahneman are examples of risky environments and these same biases may become adaptive tools in uncertain, but more realistic, environments. Furthermore, when people can learn and have environmental feedbacks from their actions, they may also show unexpected convergent conformity. Even in uncertain environments, however, people will overestimate how much they know and rely again on heuristics and simple decision rules when making decisions.

Norms, "the result of shared notions of appropriate behavior and the willingness of individuals to reward appropriate behavior and punish inappropriate behavior" (Boyd & Richerson 2001; McAdams 1997), can also dictate behavior for individuals. Much of the extant literature on norms focuses on public goods and coordination dilemmas (March & Olsen 1984; Ostrom 1998, 2000). The institutional link with political heuristics is found in norms; the norm of utilizing heuristics is due to cost and risk. Simply put, it is easier to use shortcuts or copy others to determine the best behaviors, especially in complex environments and for individuals facing difficult decisions (Boyd & Richerson 2001). Instead of inventing a new behavior of each instance to test its utility, humans observe and imitate others (Boyd & Richerson 2001), akin to Lindblom's branch method of decision-making.

Institutions represent a link between the two schools of thought in bounded rationality. As Simon believed, in spite of cognitive limitations and attention constraints, some do very well and most do reasonably well in making rational decisions—even for very complex issues. Simon viewed organizations as adaptive, structuring choices made by individuals. Most importantly, hierarchies and specialization of labor allow for tasks to be accomplished that would be impossible for boundedly rational individuals. The institutions in government, with rules and processes for creating and passing policy, are based on rules and norms in the formal branches of government, interest groups, and bureaucracy (May 1991; Wagner 2010). Institutions allow individuals to participate, learn policy processes, and specialize attention to prioritize, which can serve to support and augment individuals' abilities to make rational political decisions with more information than would be available for individuals. Because cognitive limits show through in decision-making processes most when those processes are exceedingly complex, institutions are capable of easing the difficulty in specializing. When organizations specialize, full attention can be given to a specific problem within the noisy environment. Lindblom's branch method is assisted by institutions as well, as previous decisions constitute the base to which new decisions are added in incrementalism. The base is sustained by institutions, a key example being budgetary decisions, which will be considered in depth below.

## Coming to prominence: bounded rationality and theories of the policy process

In the policy process literature, scholars took Simon's words to heart and began assuming that policy makers were boundedly rational actors, and like all individuals, the choices they made were rooted in a mixture of self-interest, budgetary constraints, and the demands of their constituency. The three considerations do not always mirror each other, and policy consideration typically reflects compromise. Because policy makers are rational but constrained by capacity, the institutions of government, and re-election, comprehensive rationality, as a model for policy makers, is too basic a theory to explain policy processes. Policy makers respond to both internal and external pressures when faced with policy considerations. The external environment puts pressure on actors and how one acts is a reflection on the environmental incentives, including institutional pressures from government actors and constituency, and internally, policy makers act based on preconceptions that make up preferences that may cause deviations from the external environment (Simon 1996; Jones 1999).

Bounded rationality is the microfoundation for agenda setting and policy processes literature because it expands the shared characteristics of individuals and institutions. Assuming at once that "actors are goal-oriented and takes into account the cognitive limitations of decision makers in attempting to achieve these goals" (Jones 1999), the theory of bounded rationality can easily be expanded to include institutions within the theoretical framework. Much like organizations described in *Administrative Behavior*, institutions are made up of individuals. This seems at once obvious but is fundamental to understanding actions in policy processes, because organizational studies rely on organizational behavior mimicking the behavior of individuals within the institutions (March 1994).

People in the policy process are boundedly rational goal-seeking actors who have limited cognitive abilities and capacities for processing information (Jones 2001). Critically important in policy process theories is attention allocation. Of course, if the environment is uncertain, it will not be an inability to allocate attention that limits decision making but instead the reality that some outcomes will never even be considered. The limited capacity of decision-makers to allocate attention in risky environments guarantees actors will miss issues they should pay attention to while building agendas to prioritize issues (Baumgartner and Jones 1993). Institutions like interest groups, political parties, and congressional committees expand the application of bounded rationality to the macro level of analysis. Bounded rationality is the microfoundation of policy processes because it maps individual theories of decision making, information processing, and agenda setting onto institutions and systems (Jones 2017; Jones and McGee 2018). The Lindblom-Wildavsky model of choice led to incremental policy change, but adding attention allocation, which must be disjoint and episodic, leads to punctuated equilibrium (Jones and Baumgartner 2005).

A definitive characteristic of American governmental decision making is its slow pace of change. Members of Congress are boundedly rational individuals, and they comprise the boundedly rational institution of Congress. If the status quo of the policy process is no change in policy, then taking action to incite is risky. Ostrom frames the policy process in government as a classic rational choice problem (Ostrom 1998). Collective actions arise when decisions are difficult; any option chosen will lead to short-term benefits for self-interests but ultimately leaves everyone worse off than before (Ostrom 1998). Due to the boundedly rationality and omnipresent self-interest of members of Congress, these social dilemmas occur in politics regularly, but theories of comprehensive rationality are unable to explain how decisions are made in them.

Bounded rationality is a more useful theory for explaining legislators' actions in social dilemmas; action is taken although the status quo is for no action to be taken and cooperation occurs that may not maximize the immediate self-interest of legislators in the short term. Legislators, as boundedly rational individuals, must make difficult decisions regularly and have a limited amount of time, cognitive processing ability, and attention to choose the best alternative, and often "satisfice," or choose an alternative that is both satisfactory and sufficient, the best option at the time (Simon 1945). With an institution that expects action and holds norms of cooperation (at the very least within the party), boundedly rational individuals will work within the expectations of the structure to make decisions and decide between alternatives. Members of Congress are influenced not only by their own self-interest, but their constituents, and the institutional structure of Congress itself. Assuming the boundedly rational character of individual decision makers, who inhabit a boundedly rational institution like government, cooperation and action are easier to understand. The decisions made in the policy process are likewise more easily understood, as they are created within a boundedly rational institutional framework.

One of the first sets of scholars to implement bounded rationality as a microfoundation were scholars studying public budgets. Budgetary considerations are suitable subjects for exploring institutional decision making, since there is a clear budgetary process, mimicking the policy process itself. The budgetary process begins with a proposal and ends with an output in measurable units. Objectives are also clearly stated in budgets; which objectives take priority reveal the values held internally by policy makers (Lindblom 1959). Budgets are also incremental actions that happen on a consistent basis from an existing base that methodically modify and build on the decisions made in previous years (Lindblom 1959; Davis, Dempster, and Wildavsky 1966). The incremental nature of budgets avoids mistakes by policy makers, because the decisions of individuals (including interest groups) "are powerful, persistent and strongly grounded in the expectations of others as well as in the internal requirements of the positions" (Davis, Dempster, and Wildavsky 1966).

Budgets prove to be branch processes as Lindblom posits, because models of the budgetary process borrow heavily from the existing base and are strategic in character. "For budgets, 'base' is previous appropriations for agency, similar to a bank of past decisions for individual decision makers" (Davis, Dempster, and Wildavsky 1966). Previous years' appropriations in the budgetary base are comprised of "sunk costs," commitments made by lawmakers in previous years. These commitments operate in a path-dependent relationship, as previous commitments can dictate what this year's lawmakers choose what to invest in and which organizational priorities to support. Sunk costs reinforce path dependence and the canalization of organizational practices (Pierson 1993; Jones and Baumgartner 2005, p. 57). In budgetary policy, sunk cost commitments provide the mechanism for understanding bounded rationality of institutional decision-making by demonstrating the direct link between current policy and previous decisions.

Sunk costs reflect the strength of the base in incremental budgets and how bounded rationality exists as a backdrop of the policy process. As a path-dependent continuation of previous years' budgets, sunk costs strengthen lawmakers' identification with the means. As a result of limited attention capacity and information processing ability, previous policy decisions become entrenched as foregone conclusions, and individuals come to identify emotionally and cognitively with these operating procedures. Identification with the means is a nonrational process motivated by bounded rationality, that exacerbates the additive and incremental branch-like nature of budgets, leading to inevitable trade-offs in decision-making, because the means become prioritized over the policy goal (Simon 1945; Jones 2003; Jones et al. 2014, p. 153).

Given the omnipresence of trade-offs in budgetary decisions, budgets are a consistent example of the trade-offs and outputs characteristic of bounded rationality and information processing abilities of individuals and institutions. They inherently hold prioritization of issues and values and reveal the capacity for attention in policy makers. The institutional constraint on policy makers in Washington for budgets is strong, as interest groups, rival parties, and a scarce amount of resources frame debate and compromise prior to policy output, two parameters for the budgetary process.

Using the budget process as an example, we can again consider that the political world is a large world. There are going to be budget alternatives that are never considered, but actors shaping budget policy fall back onto their decision rules and favor items that have been prioritized in the past despite this uncertainty (Jones 2001; Jones and Baumgartner 2005). While uncertainty, as opposed to risk, is a feature of the decision-making process for budgeting, the critical distinction is that attribute uncertainty (i.e., information about a policy problem or solution) and statistical uncertainty (i.e., being able to assign a probability to all possible outcomes or events) are distinct. Put another way, the policy problems being dealt with in major countries around the world are sufficiently multidimensional and complex that decision makers rely on attention to inform their preferences, despite the constant threat of not knowing all possible alternatives (Jones 1994). Relying on the policy problems plaguing the country or an identification with the means (whether that is to their district, state, party, congressional committee, or something else) legislators make decisions based on uncertainty surrounding attributes of policy problems or solutions when making budget decisions, even when operating in large world contexts (Simon 1996; Jones and Baumgartner 2005).

Following the budget scholars, Kingdon (1984) elaborated on the theory of bounded rationality. He expanded the policy process application by introducing policy streams. In the pre-decision-making phase, even preceding agenda setting, elites identify problems and then are able to offer solutions. When problems are identified, they are placed on the agenda, and then solutions can begin to be sought and offered.

Behavioral rationality still acknowledges the individuals and institutions have similar characteristics. While both individuals and institutions work towards fulfilling their agendas and are goal-oriented, their goals are impeded by a limited capacity for processing information. Since attention-space is limited, agendas must be set to change policy on the most pressing issues first in case time expires before reaching the end of the agenda. These shared characteristics make policy change not incrementally, but instead, in bursts.

Often, policy change does not occur in slow, incremental, steps but instead in great punctuations where there are many changes in a short period. Punctuated Equilibrium Theory (PET) (Baumgartner and Jones 1993), perceives policy change in this way. Like tectonic plates, policy change faces impassable friction most of the time. Policy processes are typically characterized as incremental, with slow, methodical, moving change through debate and gridlock in Congress. However, for some policies like health care, criminal justice, and drug policy, change may not occur at a constant and slow pace, but in dramatic bursts following long periods of no change at all. Policy problems build up without policy solutions to alleviate them, and with them there is a creation of friction. Most of the time, problems in society continue to exist in this state, as problems without clear policy solutions. Once policies begin to be introduced to try to fix the problem, salience will increase and the problem is debated publicly by legislators. During punctuated periods, the system may overcorrect itself, and a dearth of solutions may be proposed, even passed into policy, for the same problem. In the time between punctuations, friction prevents policy change from getting through, then punctuations occur like earthquakes in stick-slip fashion.



Bounded rationality, the foundation for PET, hinges upon an actor's ability to process information in a complex environment. Both individuals and organizations process information, particularly applied to the policy process. The criteria for information processing are "collecting, assembling, interpreting, and prioritizing signals in the environment" (Jones & Baumgartner 2005, p. 7), which alludes to the inescapability of limited attention in bounded rationality due to the overabundance of information in one's environment. Boundedly rational individuals and organizations prioritize what they pay attention to, and for higher-order processing that require more conscious thinking or attract high levels of attention, processing is serial in nature (Bendor 2003; Jones & Baumgartner 2005; Workman et al. 2009). Information is processed serially when one issue at a time is processed and prioritized at the expense of others. Information is processed disproportionately due to attention limits, complex problems, and an overabundance of information in the environment.

For information to be processed serially, issues must be prioritized in comparison to others. Reasoning in prioritizing of information takes on a dual system framework. Characterizing mental processes that help to prioritize attention, System 1 is fast, automatic, and often unconscious reasoning. On the contrary, System 2 is deliberate, slow, and conscious (Kahneman 2011; Thagard, Chapter 25 in this volume). Applied to political decision-making, information processing of System 2 requires more time and attention than System 1 reasoning and will result in developing expertise through deliberate and reflective reasoning. Because individuals are boundedly rational, constrained by time and information processing capacity, and faced with trade-offs in attention allocation, System 2 reasoning occurs much less frequently than System 1 due to higher demands on finite attention.

For political organizations and systems, information processing is remedied by delegating processing of information to its subsystems. At the political system level, organizations specializing in a specific issue or policy area develop expertise and consequently are able to devote attention to this topic, informing policy makers and other organizations. The oversupply of information necessitates this delegation, called parallel processing. In the policy process, bounded rationality provides the theory of behavior connecting attention and information processing for individual policy makers, organizations involved, and the institutions that dictate the process via rules of the game.

Government systems are evaluated on their ability to solve social problems rather than from top-down democratic accountability of elections, which is an institutional metric for assessing government (Jones and Baumgartner 2005). Due to the uncertainty and complexity of the environment and the multidimensionality of issues in the complex problem environment, it is impossible to assume clear and static problems and preferences. Instead, government is boundedly rational as a system, its bureaucracy and organizations make decisions in the same complex environment and have limited attention to pay, therefore are also boundedly rational and must make calculated decisions for which issues to focus on at a time. In this way, government is a complex system that is constantly adapting to react to issues and problems becoming prominent and demanding attention. Policy makers, organizations, and government systems interact with the environment by processing information. Policy change is the result of information processing, which is often disproportionate due to environmental and cognitive constraints; moreover, attention and policy solutions are not often proportional to changes in the environment itself (Jones and Baumgartner 2005).

In an attempt to solve issues in the problem environment, the political system reacts by offering policy solutions. Low or high attention to an issue dictates whether policy reaction will be an under- or over-reaction. Over-reaction leads to policy punctuations, which are large changes in policy output representing drastic surges in attention to an issue. Disproportionate

information processing provides the framework for policy reactions and punctuations, and a resulting effect is the inability for the policy response to be proportionate to the issue's severity (Jones et al. 2014). Responses to the overabundance of information and myriad issues in the environment are disproportionate, following familiar patterns of bounded rationality found in individuals. The inability of organizations to focus attention on numerous issues at once and differences in information processing mechanisms such as serial processing, determine imperfect reactions to issues in the environment.

The status quo for policy change is no change, or an under-reaction to problems in the environment. Policy over-reaction is more unusual because policy punctuations are rare due to the myriad of conditions necessary for a drastic change in output. First, attention to the issue must be exceedingly high. Second, institutional friction slows down policy change, often debilitating rapid action, assuring policy underreaction (Maor 2014). Institutional friction, often described as "gridlock," illustrates the preference for the status quo, found in policy making rules and procedures, governmental bodies, interest groups, and bureaucracy. Friction guarantees incremental policy change a majority of the time but is overcome from time to time to create a punctuation in policy change, or a burst in policy change. "Friction, in other words, is not an absolute barrier to action, but rather a major hindrance. As it operates, pressures can mount, making change, when it does occur, more profound" (Jones & Baumgartner 2005, p. 88).

Policy over-reaction attempts to address an issue, imposing "objective and/or social costs" without producing equal benefits (Maor 2012). A disproportionate reaction is a mismatch between issues and solutions, missing the mark. Likewise, a policy bubble becomes "wildly dissociated from its instrumental value in achieving a policy goal" (Jones et al. 2014, 147). Like asset bubbles in economics, which occur when an asset's price is substantially higher than its intrinsic value, policy bubbles are easily spotted in hindsight, but much more difficult to assess as they are happening.

Bubbles are often caused by imitation heuristics, such as when the actions of a single actor on a financial market trading floor, make an independent action that is seen and imitated by many others. This cascading effect, caused by many actors imitating the action of one, can lead to dramatic fluctuations or crashes, an effect that also characterizes asset bubbles in economics (Jones and Baumgartner 2005). Policy bubbles occur following a period of sustained overinvestment, demonstrating a mismatch between problems and policy action, and the accumulation of this mismatch leads to more severe shifts in policy action if and when the issue is addressed by policy. Policy overreaction that continues for a long period, even after attention has moved on to other problems, can lead to policy bubbles when policy "takes on a mind of its own," exacerbating the mismatch between policy and problem (Baumgartner and Jones 1993; Jones and Baumgartner 2005; Jones et al. 2014; Hallsworth et al. 2018).

Policy bubbles reflect an overinvestment in an issue beyond its initial value, which is extended for a long period of time (Jones et al. 2014; Maor 2014). Crime policy represents the clearest example of a policy bubble in twentieth-century American politics. In the early 1990s, as the national crime rate declined, policy output continued growing; as the problem indicator, crime rates decreased throughout the 1990s, and the policy instrument of incarceration increased (Jones et al. 2014). Ultimately, throughout the 1990s, the problem continued to decrease as prison populations remained static, which displays the mismatch between problem and policy response.

Bounded rationality serves as the foundational theory for other theories of social science, which offer theories inspired by bounded rationality that contribute to studies of public policy processes. Behavioral economic theories incorporate concepts familiar to bounded rationality, including attention allocation, heuristics, and framing, to explore how behavioral science affects

governmental decision-making in creating policy (Amir et al. 2005; Shafir 2013; Hallsworth et al. 2018). Representative of behavioral economics is the concept of nudges, paternalistic intervention by government into decisions by individuals to make them better off, *as judged by themselves* (Thaler and Sunstein 2008; Sunstein, Chapter 38 in this volume).

Attention is a finite resource for everyone, and policy makers seek to nudge people in the direction they would have chosen had they not been subject to constraints and limitations of rationality. Key to the concept is the *liberty* in libertarian paternalism, that the government does not restrict information but frames it using heuristics to encourage people to make decisions in their best interest. Consider government as choice architects in healthy food and anti-smoking campaigns or encouraging sign-ups for health care plans through the Affordable Care Act. A nudge is a strategy to guide people to make decisions in their best interest, maintaining individual freedom of choice (including the choice to opt out), while “trying to influence people’s behavior in order to make their lives longer, healthier, and better” (Thaler and Sunstein 2008, p. 7). These concepts show that the way policy is created and framed can enhance its effectiveness and is rooted in selective attention and heuristics, reflecting Simon’s original work on bounded rationality (Jones 2017).

More directly, bounded rationality is the foundational theory for other theories of the policy process, including the Advocacy Coalition Framework (Sabatier 1986; Sabatier and Jenkins-Smith 1993; Jenkins-Smith et al. 2014), the Social Construction Framework (Schneider and Ingram 1993), the Multiple Streams Framework (Kingdon 1984), and even in some applications of diffusion (Boushey 2012) and the Institutional Analysis and Design Framework (Ostrom 2011). In the next section, we will discuss how bounded rationality has shaped contemporary political science research and speculate on future uses of the model.

### **The future of bounded rationality in political science: bridging organizational and individual choice**

Bounded rationality allows for the connection of two disparate decision-making systems: the individual level and the systems level (Jones 2017). By connecting these two systems of decision making and applying an information-processing framework, bounded rationality will continue to be the micro-foundation of policy studies for decades to come. Since the publication of *Agendas and Instability in American Politics*, Baumgartner and Jones have generalized their theory of the public policy process to stress the importance of information processing and attention allocation for how lawmakers decide which problems to prioritize and act upon (Jones and Baumgartner 2005; Baumgartner and Jones 2015). Much like Simon did in *Administrative Behavior*, Baumgartner and Jones stress the decision-making process of elites as being a critical causal mechanism. This development provides a critical pathway for future work utilizing bounded rationality.

Attention allocation by organizations is inherently linked to attention allocation at the individual level (Jones 2017; Jones and McGee 2018). As we have already noted, attention allocation at the individual level is constrained; individuals can only focus on one thing at a time. While organizations expand individuals’ abilities to process information (March and Simon 1958), organizations also tend to canalize the choices of individuals and lead to institutional attention being focused on the same recurring problems and/or solutions time and time again (Jones 2001). These canals can be difficult to escape and within organizations they can turn into bureaucratic decision-rules. Decision rules often lead to incrementalism (e.g., the early work on budgets) and in some cases can lead to policy bubbles (Jones et al. 2014). These policy bubbles are the result of overinvestment of attention in a given policy area and have been

demonstrated to exist in many policy areas. The existence of policy bubbles demonstrates that canals in individuals have some sort of link to organizational attention allocation. Congressional committees provide another example. The issues committees pay attention to previously tend to get attention again; and, the solutions prescribed previously tend to be proposed again, sometimes in slightly different forms (Baumgartner and Jones 1993).

Information processing and a reintegration of institutions provide easy links between individual and organizational choice. Information processing, in the broadest sense, examines the supply and prioritization of information. Usually congressional committees will receive information and incrementally adjust the policies they deal with. Sometimes, however, new information or shifts in issue definitions might cause rapid changes in the problem and solution definitions. These changes can result in rapid changes in the proposed policy solutions. Taken together, these conditions are known as the *general punctuation thesis* (Jones and Baumgartner 2005). Information is not scarce within government; in fact, information is in oversupply. This oversupply of information leads actors to be overwhelmed by their choice environment. To deal with the oversupply, they must winnow out the information that is not useful; this winnowing process is boundedly rational. How actors search for and weight the information they receive (e.g., members in a committee hearing) is crucial to whether or not a policy problem is resolved, or a specific solution is chosen (Baumgartner and Jones 2015). Ultimately, the decisions made about what information is important are agenda-setting decisions. Therefore, to think about agenda setting, attention allocation, or information processing is to confront bounded rationality and its influence on the policy process literature (Jones and McGee 2018).

Scholars have already started utilizing the information-processing framework in examining political institutions, including Congress (Baumgartner and Jones 1993, 2015; Jones and Baumgartner 2005; Adler and Wilkerson 2012; Lewallen, Theriault, and Jones 2016), the bureaucracy (Workman 2015), and the media (Wolfe 2012; Boydston 2013). It has been applied comparatively as well (Breunig 2006; Walgrave 2008; Green-Pedersen and Mortensen 2010; Bevan and Jennings 2014).

We are at a turning point in political science for modeling decision making. As Jones (2017) has stated, “few social scientists have any faith that the rational model can take us any further than it has. But we have not thought deeply enough about what elements are necessary and which are expendable.” The information-processing perspective, rooted in Simon’s model of bounded rationality, opens a new path for understanding choice in the study of politics. We are confident that this framework will continue to shed light on new phenomena in political science, and it would not have been possible with the foundation built by Herb Simon.

## Notes

- 1 Sometimes known as “identification with the means.”
- 2 See Jones (2001) for a comprehensive discussion and thoughtful extrapolation.
- 3 The second branch is the namesake of Tversky and Kahneman and is rooted in the idea that cognitive processes are limited in even the simplest of tasks. We will reference this school of thought, but see Bendor (2003) for a full explication of the differences between the two.

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