XXIII SEMEAD
Seminários em Administração

novembro de 2020
ISSN 2177-3866

USING SIMON'S BOUNDED RATIONALITY TO DIAL PANDEMIC PANDEMIC SITUATIONS

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Agradecimento à orgão de fomento:
This research was supported by the National Council for Technological Development – CNPq

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1. Introduction

In pandemic times, decision-making may be the key either to success or failure of a country, a business, or persons. Pressed by difficult situations, people need to decide what to do having fee or none information. This is the type of situation we have been witnessing around the Globe for the last six months. People having to stay in lockdown despite the need to go out to work, to receive medical treatment, and even to have social life. Staying home to preserve health or getting out to provide for themselves is a decision to be made. Doing decisions is a difficult task in normal times, it gets harder in terms when we don't know how long the pandemic will last. This paper address decision-making in pandemic times using a theoretical framework designed to help organizations to decide in normal times. For so doing, we intend to contribute with insights that would be useful to tackle the economic, health, and social crisis we are just starting to live.

Herbert Simon's book *Administrative Behavior* appeared in 1945 and outlined an efficient method of making organizational decisions based on procedural (bounded) rationality. This effort was a bold and pragmatic take on the rational-comprehensive process already well-established in economics and incorporated into the work of Weber (Eisen, 1978), Dewey (1933), and Frederick Taylor (1914). Simon's unique perspective stressed the importance of scientific knowledge and fact-based decisions. Authors, such as Waldo (1952), questioned the exclusion of values in public administration decision-making, and others later reemphasized the importance of values to the field (Frederickson, 1980; Spicer, 2010). However, Simon's commitment to verification and positive research still resonates with many (White, 1986).

We developed an interest in the use of the bounded rationality paradigm while studying research in cognitive science, which raised questions about how public administration had applied new insights on human judgment. We quickly learned that bounded rationality remained as the dominant decision-making paradigm in public administration—hardly changed for more than half a century. The presumption may be that bounded rationality tells us all public administrators need to know about judgment in public organizations,

but this is hardly the case. To get a clearer picture of state of the art, we conducted a systematic literature review in three databases, namely Scopus, Sage, and Web of Science, for 1962 to 2020. For so doing, we used "Herbert Simon" and "bounded rationality" as keywords.

Our research question is if public administrators have the needed skills to produce the best possible outcomes to dial with pandemic situations. We use the Brazilian pandemic Covid-19 crisis as a case to corroborate the elements proposed in the literature as a follow-up of Herbert Simon's Bounded Rationality. For so doing, in the next section we present the tenets of the theory. After that, we describe how the advances in the theory were assessed by a literature review. We present an analysis of the Brazilian Government decision-making in line with the update of Bounded Rationality.

2. Bounded Rationality

Studies of logical positivism and his scientific observations lead Simon to conclude that the rationality of decisions was a central concern of administrative theory (Simon, 1947) and that his procedural rationality should guide government action. As an antagonist, Simon used the rational/economic man as a foil—pointing out the absurdities of selecting the best possible alternative. In contrast, Simon's administrative man satisficed and sought a course of action that was satisfactory or good enough (Simon, 1997). Once stripped of pretensions, the rational model was the unrealistic result of excessive abstract theorizing (Jones, 2003). As Simon (1997) wrote, "Rationality implies a complete, and unattainable, knowledge of the exact consequences of each choice" (Simon, 1997, p. 94). Simon's contrasting three-step model retained some elements of rationality. He stopped short of an ideal choice: "(a) viewing the behavior alternatives before decision in panoramic fashion, (b) considering the whole complex of consequences that would follow each choice, and (c) with the system of values as criterion singling out one from the whole set of alternatives" (Simon, 1997, p. 93).

The process of satisficing remains demanding. It would certainly be in terms of patience (what Simon calls docility) and requires rigorous fact-finding, development of mental frameworks, communication, and raw theoretical

predictions. Success requires accounting for "factors regarded as most relevant and crucial" (Simon, 1997, p. 119). Simon anticipates the problems that his rigorous process presents, and he acknowledges that administrators must frequently make quick, intuitive decisions and that satisfactory solutions are not always possible. In response, Simon offers a demystified intuitive decision-making process, which he links to memory. Both computers and the human mind retrieve information from memory as needed. Decision-makers "employ the same mix of intuition and analysis that is used in other expert systems" (Simon, 1997, p. 135), though developing this ability takes experience and training. Decisions based on emotion are the sole exception to the bounded rationality model. According to Simon, stress can lead to poor judgment in the form of irrational, emotional decisions.

Finally, a key element of Simon's impact on public administration is that he actively sought to address public administration issues. He laid out his manifesto in "The Proverbs of Public Administration," which *Public Administration Review* published in 1946, and he sent bounded rationality and satisficing directly in "Administrative Decision Making," published by *PAR* in 1965. Other *PAR* appearances included a review of "The Science of Public Administration" by Robert Dahl in 1947 and a 1958 reply to a discussion of his classic book, *Administrative Behavior*. Another notable contribution to public administration appeared in a debate with Dwight Waldo and Peter Drucker, published by the *American Political Science Review* in 1952. Though hardly undisputed, Simon's ideas live on; however, he never fully realized his goals of developing a science of decision-making and building a bridge between social psychology and public administration.

3. Method

To assess the impact of Herbert Simon's bounded rationality on the field of public administration, we conducted a content analysis on articles uncovered in a full-text search that included years from 1962 to date. We used the search terms "Herbert Simon" and "bounded rationality" as keywords. The research was carried in databases e.g. Sage, Scopus, and Web of Science. The first filter was to focus on papers discarding books, book chapters, and reports.

The second filter was to remove the articles that didn't receive a single citation in the period. We used the Google Scholar number of citations as a reference. The third filter was to concentrate on those articles that have received at least one citation per year. For so doing, we divided the number of citations by the age of the article (2020 minus the year of publication).

This analysis used conventional content analysis (Hsieh & Shannon, 2005), which involved identifying keywords. We then analyzed these keywords using a method suggested by Miles and Huberman (1994): the Partially Ordered Meta Matrix process for analyzing texts and documents. These tools consist of fragmenting the data into units as small as possible to find "common codes, common displays of commonly coded data segments, and common reporting formats for each case" (Miles & Huberman, 1994, p. 178). The search for keywords sought to identify how the authors cited Simon's ideas. We classified these keyword references into five categories reflecting critical aspects of Simon's bounded rationality model. For example, in Brown and Brudney (2003, p. 33) statement "When the problem context lacks structure, and the certainty of outcomes is low, decision-makers tend to rely on tacit, intuitive knowledge," we used the keyword 'outcomes' as an indication of the existence of the category 'defining results.' The keywords were then grouped according to some semantic rationale, which made sense for the keyword in the way the authors used it for depicting Simon's ideas. Table 1 displays the category breakdown of the 113 reference segments that we identified in the 86 articles uncovered by literature searches.

The content analysis offered a broad perspective on the application of Simon's work in public administration but failed to address in-depth whether researchers were developing new knowledge. We explored this question further by adapting criteria established by McCurdy and Cleary (1984) for their study of public administration dissertations.

4. Findings

The literature search ended in 122 articles. After removing, duplicates, books, book chapters, and reports, we found 96 useful articles. One article published in 2015 has received zero citations according to Google Scholar, and it was

therefore removed. Nine papers received less than one citations for the period, and they were also removed from the content analysis process. The analysis presented below was carried out in 86 articles.

4.1. Frequency of Publications

The first paper was published in 1978 and the last in 2019. In 2003, we observed the publication of seven articles, and it is the larger number. We observe the publication of five articles in 2008, 2009, 2010, 2011, and 2013. In the last three years, we observe the publication of one article focusing on the theme. This evidence indicates Bounded Rationality has been in the agenda for the whole period with higher attention from 2000.

4.2. Outlets

Articles were published in several journals, but we can identify a pattern in terms of areas of interest. Figure 1 demonstrates a concentration on management, followed by Economics, Psychology, Public Administration and Politics, and by Health Care. Although the number of publications in the category of management, the higher number of publications is a journal classified in the Public Administration & Policy – Public Administration Review with 19 publications, followed by Journal of Public Administration Research and Theory with seven articles.

4.3. Expanding the knowledge

We assessed how many times the articles have been quoted in terms of number of citations. As stated before, we used Google Scholar citations to measure the extent that papers have generated new knowledge. The highest score is Kahneman (2003) published in The American Economic Review. To date, it has received 5,710 citations indicating an average of 336 citations per year. The second is Kahneman and Klein (2009) published in the American Psychologist, which received an average of 185 citations per year. The third most quoted is Gigerenzer and Goldstein (1996) published in the Psychological Review being quoted 163 per year.

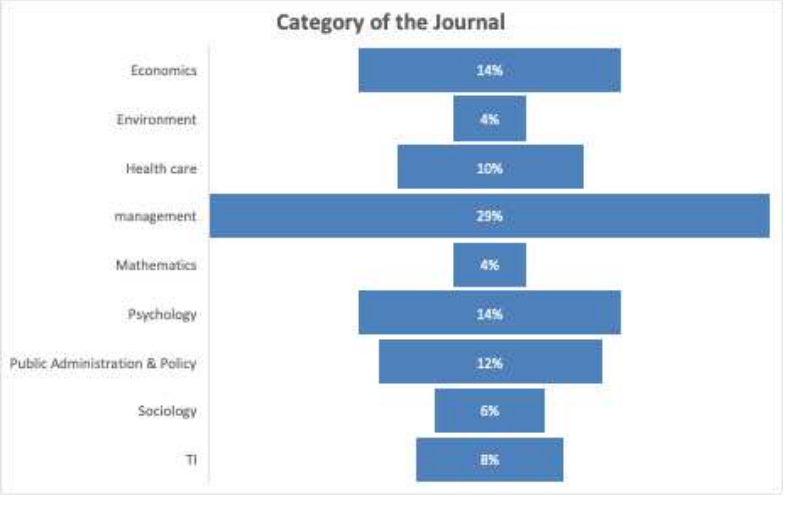

Figure 1: Percentage of Publications by Category
Source: Data Analysis

4.4. The areas for improvement in Bounded Rationality Theory

The content analysis resulted into five sets of Simon references: human capacity, cognition, expressing boundedness, identifying environmental challenges, and defining results. Table 1 indicates a focus on means for explaining cognition as an important factor to decision-making. Authors also focused on addressing boundedness as an issue to the decision-making process. The categories are explained as follows.

Table 1: Simon References by Category

Categories	***Number of References***	***Percentage***
Addressing Boundedness	29	26%
Assessing Human Capacity	17	15%
Defining Results	15	13%
Explaining Cognition	42	37%
Identifying Environmental Challenges	10	9%

Source: Data Analysis

1. **Assessing Human Capacity** addresses innate social abilities, such as attention, attitudes, emotion, cognition values, interests, intuition, memory, motives, and reflexes.

2. **Explaining Cognition** includes several aspects of rational thought, such as information processing, adaptation, limits, analysis, anticipation, approximation, and assessing.

3. **Addressing Boundedness** includes references to limitations imposed by organizations: authority, control, constraints, procedures, hierarchy, and routines.

4. **Identifying Environmental Challenges** refers to aspects of the decision-making process outside human control, such as complexity, ambiguity, uncertainty, and predictability.

5. **Defining Results** include the following categories: seeking behaviors and related goals, including economy, effectiveness, efficiency, maximization, optimizing, profit, purposes, satisficing, simplification, and utility.

Figure 1 illustrates the references identified by the Partially Ordered Meta Matrix Analysis. Cognition and boundedness received the most attention in the 86 articles that we analyzed. The fact that just these two categories comprised 63 percent of the Simon references tells us something about the depth of interest in administrative decision-making. The following sections examine the references in the five categories.

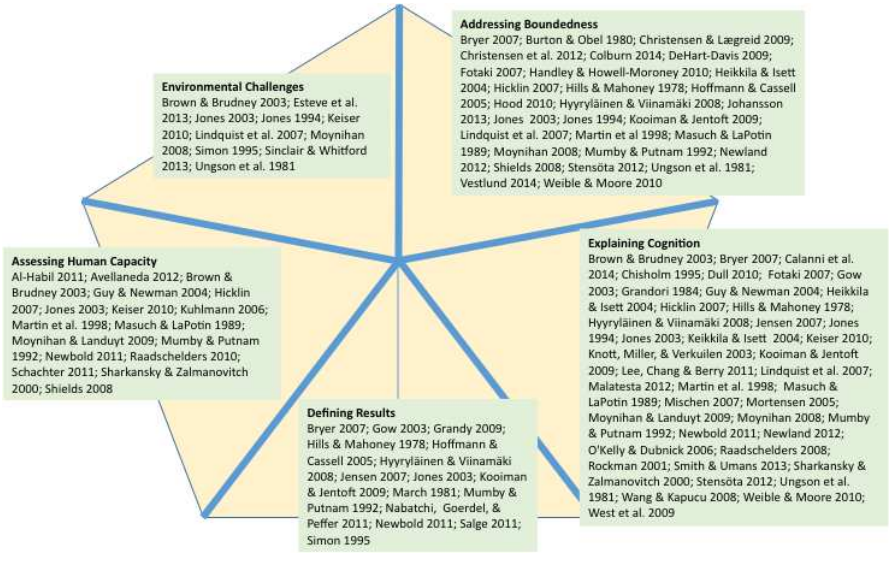

Figure 2: References by Category
Source: Data Analysis

5. New Possibilities: How to improve decision-making in pandemic times

Simon professionalized the rationality debate, and the legacy of bounded rationality remains secure, but it has become increasingly clear that reasoned decision-making is an exception to the rule. As Kahneman (2011) argues in *Thinking Fast and Slow, age*nts do not "reason poorly." They act intuitively, and the sway of emotion is a central characteristic. Bounded rationality suggests limitations on what humans can calculate, but Kahneman (2003, p. 1469) shows that agents act "on what they happen to see at a given moment." Problems arise because rational computations fail to happen. Relative to the Simon paradigm, we lack attentiveness (at a minimum).

System 1 accesses impressions that are "not voluntary and need not be verbally explicit" (Kahneman, 2003, p. 1452). In contrast, System 2 judgments are always explicit and intentional. Many discussions of bounded rationality in the cognition category describe a process of decision management, where decisions are simplified. However, this is easier to advocate than to do because the intuitive choices of System 1 are virtually automatic and more accessible; "they come to mind spontaneously" (Kahneman, 2003, p. 1452). Making decisions via System 2 is slow, effortful, and deliberate.

Kahneman and Tversky (1977) addressed the breadth and persistence of judgment errors in a study conducted for the Defense Advanced Research Projects Agency in 1977. This work demonstrated that judgment errors are systematic rather than random. "There are no significant differences between the judgment processes of experts, intelligence analysts, and physicians, to cite but a few," and that erroneous intuitions "remain compellingly attractive even when the person is fully aware of their nature" (Kahneman & Tversky, 1977, p. i). These thinking challenges contrast sharply with the manageable process that Simon describes and ring true for anyone who has addressed intractable administrative and policy problems.

Looking at the COVID-19 pandemic that stroke the World in 2020' early months, countries' administrations behave erratically looking for ways to deal with the pandemic sparing lives, at the sometime that tried to keep their economies in running in slow motion. At the moment, some countries that adopted the lookdown system are starting to get to normal, while others are still trying to keep low the number of contaminations and deaths.

As we didn't have enough information to make the best decision, countries such as China, Japan and Korea, which have a tradition on fighting pandemics managed to have lower number of contaminations and deaths. Countries which low experience in pandemic, e.g. Brazil, took more time to get to terms with the best strategy. Some possible biases relevant to public administration include excessive optimism and overconfidence, interest (silo mentality), saliency (overweighting recent events), anchoring (stability of an existing point of view), halo effect (basing an assessment on a single characteristic),

discounting delayed rewards, and sociability (groupthink and sunflower management).

We use the categories proposed in the last section as lenses to try to see with more details how an unexpected phenomenon, such as pandemic, is likely to knockdown an entire administration for over six months. We focus on the case of Brazil. We use information from newspapers without quoting exactly what they were broadcasting.

The moment we write this paper, the World has a shocking nearly 15 million confirmed cases of COVID-19, and more than six hundred thousand deaths, according to the World Health Organization. Brazil has more than two million cases and more than eighty thousand deaths. The number of cases is twice as bigger as India, which has a population twice as bigger. The number of deaths is only smaller when compared with the United States of America. Something is very wrong when even having information about the spread of the pandemic in China and Asia, Brazil has the second largest number of cases and also the second number of deaths. Countries with larger populations, such as China, India are in much better situations.

5.1. Assessing Human Capacity

At the time, the Ministry of Health started exposing the COVID-19 situation in Brazil (February), there were people defending the use of masks and lockdown. The attitudes were very much influenced by what was happening in China and other Asian countries. At this very time, President Bolsonaro was sending an optimistic message that the COVID-19 was just a "small flue", and healthy people had nothing to fear. His attitude was understood as an attempt to keep business as usual avoiding economic crisis endangering small enterprises and people from the informal market. As a result, he fired the Ministry of Health, who were against the use the prescription of Chloroquine, and in favor of the lockdown. In this vein, President Bolsonaro position can be explained (not accepted) because he was moved by interests, memory, motives, and the like.

5.2. Explaining Cognition

The Ministry of Health position in the pandemic was influenced by several aspects of rational thought, such as information processing, adaptation, limits, analysis, anticipation, approximation, and assessing. He defended the idea that there was no empirical evidence about the usefulness of the Chloroquine as an effective medicine. The use of the medicine could impact health care twofold: the medicine was not effective, and it could waste time and lives, and the medicine could not be available for other diseases' treatments, which seems to be the case of malaria. President Bolsonaro's position could not be explained by cognitive aspects as it was clearly motivated by emotion and biased thoughts.

5.3. Addressing Boundedness

When President Bolsonaro fired the Ministry of Health, because he didn't agree with the Chloroquine protocol, he demonstrated the boundaries surrounding the pandemic as a public policy. He made crystal clear the limitations imposed by his authority and hierarchy and routines. He also made clear that if the Minister did agree with him, he would be fired.

5.4. Identifying Environmental Challenges

Environmental challenges are the most relevant aspect of decision-making to dealing with the pandemic. The pandemic originated overseas, and it has been brought to the country by infected people. Some countries, such as the United States, even closed airports and ports to stop the contamination process. As environmental challenges induce complexity to the decision-making process outside human control, by increasing complexity, ambiguity, uncertainty, and predictability, decisions were not taken timely and lives are in danger.

5.5. Defining Results

Brazil's performance in the pandemic is likely to be regarded as very ineffective in several dimensions. We have the second worst case scenario in dealing with the pandemic. Despite the delay in the lockdown, the estimate for the Gross Domestic Product indicates a decrease around 6.5%. due to the lockdown, sales decreased over 16%. The number of enterprises decreased in

30%. Therefore, the Brazilian Government made the worst possible decisions when neither lives were spared, nor the economy.

Intuition certainly plays a vital role in public administration. Hummel (1991) affirmed the value of intuition for public administrators, and he argued that they gained knowledge from storytelling. As he said, "When managers are asked how they determine what is going on in their world, they refer to intuition, judgment, flying by the seat of your pants" (Hummel, 1991, p. 32). While such strategies are no doubt unavoidable, we must ask if public administrators have the skills needed to produce the best possible outcomes. Leading academics have argued that public administration is a field of judgment (Lynn, 2001; Morgan, Kirwan, Rohr, Rosenbloom, & Schaefer, 2010), but there is little evidence of efforts to develop the thinking skills that public administrators need. The situation we are living in Brazil at the moment is a clear evidence about we need to invest in thinking skills, at least from voters.

6. Conclusion

This analysis examines concepts and themes well integrated into public administration research and practice, and what we find is a lack of commitment toward improving decision-making skills. Core Simon's ideas have endured, but this has not produced a broad interest in topics related to judgment and rationality.

Sadly, the dominant approaches to decision-making stressing simplification and intuition may be quite dangerous. Decision-makers are apt to leave out salient information and add unwanted biases. The Simon paradigm remains relevant, and public administration can gain much from accelerating ongoing efforts to assess organizational processes and draw clear distinctions between facts and values. However, the now trending work in psychology is potentially far more powerful. Improved knowledge about public administration decision-making is an essential next step.

We cannot overstep this research, however. Much remains for others to investigate. Many ideas in the rapidly evolving field of judgment are new to

public administration. Researchers might question the relevance of lab studies in psychology for public administration decision-makers, for example. Besides, others may develop new ways to assess the rich literature of public administration and related fields.

Despite any weaknesses in this effort, we do not think public administrators should look at decisions in quite the same way again. Practitioners need critical thinking skills because the potential for cognitive bias is always present, and organizations must encourage smart decisions and limit possibilities for errors. Researchers can categorize and clarify the issues and help refine knowledge specific to the public administration setting. There is no reason for the delay, given that the confluence of technology, marketing, new communications technologies, and growing complexity will place the cognitive skills of public administrators under ever-greater strain.

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[i] Acknowledgement: This research was supported by the National Council for Technological Development – CNPq