

Framework Effectiveness and Prevalence in Public Policy

A survey of the field and a discussion of the need for an agent based systems approach

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ABSTRACT: Policymakers have an important role in the comprehension and creation of adequate political agendas that meet the needs of their constituency. Regardless of their specific field, all policymakers face decision making challenges each day. This paper seeks to understand and address how individuals in the policy field view the policy making process and what frameworks they use to help them make decisions. A PRISMA literature review and survey of policy professionals was conducted to determine what frameworks policy makers use (if any), why, and whether they perceived them as effective. Results of the study reveal that framework use increases with education level and that SWOT and CBA (cost-benefit analysis) are chief among the frameworks used although they fall short of capturing the complexities of the types of systems in which policy makers intervene. The discussion offers the Agent Based Approach (ABA) as a possible solution to the opaque and non-comprehensive nature of mainstream policy frameworks such as SWOT, CBA, and others. Our discussion showcases the universality of the ABA approach, and sets it apart from other approaches that fail to account for complex adaptive systems (CAS)¹.

KEYWORDS: ABA | systems thinking | DSRP | policy | frameworks

Introduction

The world is full of complexity, uncertainty, and overlapping systems that defy simple categorization and understanding. As climate change, racial injustice, and armed conflict dominate news channels around the world, policy professionals must grapple with seemingly intractable problems and use policy instruments

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to affect positive change within a multitude of systems. To that end, students of public administration, the political and social sciences, and policy practitioners within a variety of institutions use tools and frameworks to help better understand, define, and ultimately solve problems. However, the phenomena they seek to change may also be understood in relation to underlying systems that are complex and adaptive. Without a greater understanding of these systems, solving these problems is difficult or impossible.

The concept of complex adaptive systems (CAS) has a long history in academic literature across a variety of fields ranging from the social sciences to physics and mathematics (e.g. Aubin et al., 2011; Dooley, 1996). While the concept may seem intimidating at first glance, a CAS is simply a system made up of agents that react to their environments using simple rules, which leads to the emergence of system-level behaviors and properties. However, understanding a CAS lies not just in granular or exhaustive definitions of the agents or behaviors, but also in analyzing connections among the agents, the system, and the resultant emergent properties at the macroscopic level. Only after building an understanding of the mental models of the agents and the way that these models shape their local behavior that collectively lead to the emergent properties of the system can a researcher or policy analyst begin to see the foundational simplicity that often underlies complex problems. More importantly, leveraging this insight during the process of policy design and implementation is essential to creating effective policy.

Building this understanding is even more crucial given the nature of policy problems. Wicked problems refer to problems that are particularly tricky or vicious and make up the vast majority of issues that policymakers seek to address (Rittel & Webber, 1973). These problems predominate in a VUCA world (volatile, uncertain, complex, and ambiguous) that is both itself a CAS and made up of CASs. Effectively addressing these wicked problems requires that policymakers first understand that they are dealing with a wicked problem (Yawson, 2015) and understand the CAS dynamics at play. In their most basic form, policies are “a statement of the simple interaction rules that one predicts will lead to desired systemic change” (Cabrera et al. 2020). Policy practitioners often rely on heuristics and tools to better understand CASs and the policy options available in order to achieve the desired impacts. Many frameworks exist, and are taught in administration and management programs and used by policy professionals, but there is no strong consensus around the tools or approach that can best accommodate the complexity of the problems and systems that public policy professionals face.

This study adds to the literature by evaluating whether policy professionals use frameworks in their decision-making processes and the policymakers’ perceptions of the effectiveness of their processes. Current scholarship on policy design and frameworks is also examined to determine how both scholars and practitioners think about addressing complex policy problems. Data, methods and analysis from a survey conducted with policy professionals are also offered to better understand what frameworks or decision-making processes are used in practice. We conclude with a discussion of the results and recommendations for future study.

Literature Review

While the purpose of this study is to determine how frameworks are used throughout the policy field, the initial scanning for relevant research in Google Scholar on specific frameworks revealed a lack of coherent evaluation of the actual effectiveness of some of the most common frameworks discussed in

academia such as SWOT (strengths, weaknesses, opportunities, threats) and CBA (cost-benefit analysis). Following the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) methodology (Page et al., 2020), our team conducted several searches in order to establish a baseline understanding of the state of the literature regarding the tools and frameworks available for policymakers. The PRISMA Methodology contains several steps that allow for a more transparent and systematic review process. The steps include: (1) defining a clear objective and research question, (2) specifying the search and selection criteria, (3) a statement of the sources of information, and (4) a clear statement of the process for narrowing down articles for full review (Page et al., 2020). Searches for “policy design theory,” “policymaking tools,” and “policy frameworks,” were executed on Google Scholar and through the Cornell University Library Online Database. Preliminary results were further narrowed to restrict entries to journal articles that were available in full text and to eliminate duplicate entries. From there, the top forty results in each database were sorted based on their apparent applicability to our research using three levels of review: beginning with their titles, then their abstracts, and then the content of the articles themselves. Our team chose to select from the forty most cited articles as it would provide a decent sample of the types of research that pertained to the given search term. Table 1 provides an overview of the selection process for each search term with the number of articles selected after each round of review.

Level of Review	Search Term		
	"Policy Design Theories"	"Policy-Making Tools"	"Policy Frameworks"
Total # of Articles Returned	3,948,791	5,045,306	745,383
# Selected from the Titles	36	32	26
# Selected from the Abstracts	9	17	8
# Selected for Full Review	9	17	7

Table 1: Overview of PRISMA Literature Review

After the initial search, our team reviewed the titles of the top forty results with the most citations in each database. Selection of articles was based on the titles focused on policy area and the mention of a framework in the design process. This was done looking at keywords within the titles such as “policy design,” “framework,” or “effectiveness.” After reviewing the titles, abstracts of selected articles were reviewed with a specific focus on the scope and context of the study. For this phase of the review process, we specifically looked for an indication that the article focused on the method used in formulating policies rather than the policies themselves. From there, articles went through a full review if the study included a discussion of strategies or frameworks used in the front end of policy design and whether the strategies were effective. We also reviewed articles that discussed elements within the policy design phase that are important to consider when addressing complex policy problems.

Using the search criteria discussed in the previous paragraph, we will outline the number of articles selected in each round of review for the three search terms. For the search term “policy design theory,” Google Scholar returned 3,870,000 results and the Cornell Library returned 78,791. After scanning the top forty cited search results for relevance, twenty articles were selected from Google Scholar and sixteen were selected from the Cornell Library for further evaluation. Based on the abstracts, four articles were selected from Google Scholar and five from the Cornell Library for full review based on the focus of the study on frameworks and processes used in the early stages of policy formulation.

The search term “policy making tools” returned 65,306 articles from the Cornell Library and 4,980,000 articles from Google Scholar. Of the top sixty results from Cornell Library, seventeen were selected based on the title (based on the aforementioned criteria), and fifteen articles were selected from the top forty from Google Scholar. Eight articles from the Cornell Library were accepted after reading the abstracts, and nine were accepted from Google Scholar. Only three articles from Google Scholar were accepted for a full review.

In the Cornell Library, the search term “Policy Frameworks” returned 745,383 results. After scanning the top forty results, twenty-six were selected based on the title. Eight were accepted after examining the abstract, and a total of seven were considered for a full review. The remainder of the literature review will discuss our findings from the research selected.

The basic components of policy design involve problem definition, rules for the distribution of burdens and benefits, identification of the target population, selection of tools for policy directives, and the specification of the implementation structure (Schneider & Sidney 2009). The complexity inherent in policy problems presents substantial challenges to policymakers as “the increasing interdependence of policy areas and programs will mean that any intervention into one area may have significant consequences for many other policies and programs” (Linder & Peters 1984). Due to the ever-increasing complexity of the problems policymakers face, there is a greater need for coherent research into strategies for designing policies that address these multifaceted issues. In their analysis of the policy process, Linder and Peters (1984) suggest that the design of policy choices is based mostly on the experience of what has worked in the past. Not only does this limit the available alternatives, but it also leads to the tendency for analysts to evaluate the alternatives under the criteria of “trouble-free implementation” (Linder and Peters, 1984). Frameworks such as SWOT, CBA, and force field analysis are framed in a way that places emphasis on barriers to implementation. Therefore, the focus is not on “Which of these will address the problem most effectively?” but rather, “Which of these will face the least amount of opposition?”

Choosing policy design methods based on experience is not necessarily wrong. In some ways, it saves policymakers time in a profession where time is a scarce resource. However, it begs the question, “Does ‘one size fit all’ in policy designs, or do we need more finely tuned designs for each particular problem?” (Peters 2018). A great deal of policy design frameworks offer rigid structures within which information about the given policy problem must fit. This approach severely limits the problem analysis phase of policy design and impacts what policy alternatives are generated. As a result, solutions are developed that treat an oversimplified problem that no longer resembles the complex system due to the tendency towards “quantification and compartmentalization” (Jager & Edmonds 2015). Often, the methods used for policy design are not well suited to the actual problem. The lack of frameworks specifically for problem analysis has led to the proliferation of frameworks that address specific policy areas, such as healthcare or sustainability. Hamra et al. (2020) argue this point when analyzing current

frameworks in health system governance (HSG) stating, “the currently proposed tools in the literature focus on one aspect..., limiting their relevance to policymakers who need consistent tools that can be efficiently applied to a range of settings.” In the nutrition policy field, there are at least thirty-eight frameworks used (Lobczowska et al., 2022). Another factor is the emerging trend of using technology to aid in policy design. In studying the emerging field of digital tools in policy, Kamateri et al. (2015) found “a list of 75 tools and technologies.” The vast quantity of hyper-specific tools complicates the process of designing functional policies. It either requires practitioners to specialize in subsets of a policy topic or for them to invest time to familiarize themselves with each framework in the field and come up with a method for determining which one to use for the specific problem.

Nobel Laureate Jan Tinbergen asserted that policy design frameworks arose as an alternative to “decisions taken on the basis of a general idea of progress and often somewhat haphazardly” (Tinbergen 1958). However, the mere existence of policy design theories and frameworks does not naturally lend itself to the formation of policies adequately equipped to address the given problem. As Kris Hartley and Michael Howlett (2021) posit in their study of policy assemblages, many policies “evolve from muddled processes, laissez-faire happenstance, or happy accident” despite the prevalence of frameworks and theories for designing policy. Therefore, policy design is still a haphazard process. However, Hartley and Howlett (2021) argue that the apparent lack of an intentional blueprint for individual policies can lead to a seemingly coherent construction of a system of policies, what they call a bird’s nest. They explain a bird’s nest as a structure “of complex component assemblages emerging from interdependent and disorganized building processes” (Hartley and Howlett 2021). What may appear, at first, as a set of unrelated policies lacking any kind of structure eventually turns into a system of policies that work in tandem to address policy problems. The authors argue that these systems continue to function due to redundancies arising from the ad hoc nature of its construction. The policy parts eventually “congeal into a stable entity over time” (Hartley and Howlett 2021). There are two main issues with this argument. First, it remains unclear whether there is a method to predict if the various policy parts will form a coherent policy system. There is a possibility that the parts will not, in fact, form into a coherent system that is resilient. Secondly, should stability and equilibrium be the goal for policy assemblages? Complex adaptive systems (CASs) will not enter a stable state over time. While Hartley and Howlett (2021) argue that the structure of policy assemblages “allows them to absorb unanticipated stress,” this only explains how the problem acts on the policy, not the other way around. Rather than allowing assemblages to haphazardly form over time, the policy field needs to focus on intentionally designing dynamic policies that act on the problems.

A failure to consider how policies impact the problem and how the problem impacts the policy misses a crucial aspect of policymaking. The relationship between problem and policy goes both ways. An important step in the process is to consider how policies interact with and operate in the systems they were designed to change. Not only do policies “emerge from a political and social process,” but they also bring about new processes (Schneider and Sidney, 2009). Policies change the emergent properties of the system. This is commonly referred to as policy feedback. However, Schneider and Sidney argue for the use of “policy feedforward, as we are talking about how policy changes the dynamics of future political action” (2009). While the term is valid in the sense that policies do in fact change the system in which they operate and, therefore, impact future policies, there is also value in the feedback model of thinking. It captures the idea that policy evaluation is necessary to determine if the policy had the desired effect on the problem. Such evaluation provides feedback on how the policy can be changed moving forward. Stewart and Ayres (2001) posit that systems theory is a useful tool in analyzing the feedback mechanisms

in the policy field. On the point of refining policies through the feedback system, they argue “that the nature of the problem cannot be understood separately from the solution. For policy problems characterized by complexity...using systems concepts offers a way of rationalizing aspects of existing practices and of suggesting directions for improvement” (Steward and Ayres, 2001). Only thinking about the impact on future policies fails to account for the whole system. The impact of past policies will likely be different in light of new interventions.

Therefore, it is crucial to understand the two-way relationship between the problem and the policy solution. Moreover, the ability to analyze the interconnectedness of various policies and problems helps provide a clearer picture of the whole system. Bird’s nests in the policy field not only limit the effectiveness of solutions to complex problems but also limit the ability of practitioners to evaluate whether the policy had the intended effect. Intentional policy designs make it “easier to assess what may have gone wrong (or right) ...and then to improve it in another iteration of policymaking” (Peters, 2018). In contrast to the bird’s nest metaphor, policy design should be a “conscious effort” to create a roadmap to address CASS (Peters, 2018). Policymakers need a clear understanding of the current state and the desired state in order to assess what available policy instruments are viable. Moreover, it facilitates the process of analyzing what impact the policy had. Did the policy move the system closer or farther from the desired state? Answering that question requires deep knowledge of both states. Many frameworks fail to account for the system as a whole. In fact, systems (e.g., the particular quality of or “type” of system involved, such as complicated, complex, stochastic, etc.) are largely left out of the discussion on policy frameworks. Instead, the discussion focuses on isolating the problem and the proposed policy alternative which makes it difficult to include some elements crucial to effective policy design.

The study of the literature referenced several of these elements such as the involvement of stakeholders, and the power and interest of the agents involved in the design process. However, it is unclear the extent to which certain frameworks include an analysis of them. Stakeholder engagement is one common topic in the policy field as policies must account for different perspectives across the various groups impacted by the problem. In particular, when stakeholders should be engaged is a topic of debate. It is not uncommon for stakeholders to be included “after the problem definition has occurred and alternatives have already been defined” (Pluchinotta, 2019). Involving stakeholders late in the process limits the impact they can have on the policy design. Thus, policymakers run the risk of missing valuable perspectives on the problem definition and ideas for potential policy solutions. Stakeholder engagement is crucial because it gives policymakers access to potentially new knowledge that “supports the generation of new concepts” (Pluchinotta, 2019). In order to develop a more holistic view of the problem and the available options, policymakers must work with their constituents and other stakeholders. Some methods are being proposed to facilitate the inclusion of stakeholders in the design process. One such method is crowdsourcing in the early stages of problem definition and evaluation which would “act as technological enablers and catalysts for the participation of crowds in the policy cycle, and as such can have almost limitless applications in the policy process” (Taeihagh, 2018). The idea behind IT-mediated crowdsourcing is to make participation more accessible and convenient.

An important aspect of stakeholder engagement is analyzing the power dynamics among the various actors in the policymaking process. Power determines who’s perspective dictates the design. Sievers and Jones (2020) argue that because power functions as “the potential structural dominance of certain beliefs among individual policy actors and coalitions,” analyzing its dynamics must become a central tenet of the design process. Including stakeholders early in the process will aid in the analysis of

power dynamics. Unfortunately, most theories and frameworks of policy design fail to account for power dynamics “which renders the theoretical understanding of policy making incomplete” (Sievers and Jones, 2020). Understanding the different perspectives is crucial because policy problems and solutions involve multiple actors. Failing to assess the power dynamics leads to an incomplete understanding of a system because there is no method for understanding the different perspectives involved and why some perspectives are chosen over others. Therefore, it makes sense why there is a need to analyze the power dynamics between actors when developing policies.

Research regarding the limitations of current policy design frameworks and methods is ubiquitous. Multiple interests and perspectives prevent the design and selection of a single best option, as each actor will have a different problem definition and idea about the most effective solution. Uncertainty and ambiguity hinder the design and implementation of reliable models that all parties can accept (Thissen, 2002). When there is a lack of consensus on a proposed policy solution, the likelihood of inaction on the given problem rises. In a similar way to Pluchinotta’s (2019) argument that knowledge supports what concepts are generated, so too does the level of consensus drive the values inherent in the concepts generated (Thissen, 2002). Policymakers must contend with different interest groups and stakeholders, and therefore policy design frameworks should include some form of stakeholder mapping and engagement early in the process to aid in building consensus.

Another challenge for functional frameworks is the complexity of the problems they are used to address. As mentioned earlier, most frameworks are rigid structures that do not account for the adaptive nature of the problems. When the policies that result from those frameworks fail, they usually fail in three basic areas: “a model of causation, a model for evaluating alternatives and outcomes, and a model of how interventions operate” (Linder and Peters, 1984). Solutions to multifaceted and interconnected problems cannot be developed through frameworks that offer reductionist methods for conceptualizing knowledge about the problem. Failures arise because policymakers tend to simplify the analysis by reducing “problems which have many interconnecting parts and complex feedback loops to a stylized cause-and-effect relationship” (Stewart and Ayres, 2001). Instead of seeking to understand the system, they look for the root cause from which the problem stems. This approach distorts problem analysis as it fails to account for key components and relationships within the system as a whole. Therefore, the policy alternatives developed in response to root causes will be inadequate.

The issue with most policy design theories and frameworks comes down to how information is structured. For example, CBA’s unit of analysis is in monetary terms and is “based on utility calculation, including converting many non-marketable items...into monetary values” (Peters, 2018). This kind of translation creates several problems with construct validity because different people will assign different values to non-marketable items. It also limits the scope of analysis. Furthermore, despite its widespread use, “nobody considers the result of a CBA to have a normative validity” (Fayard et al., 2021). There is still a great deal of subjectivity in how the elements are translated into monetary values. Most other frameworks involve a similar kind of rigid categorization of knowledge. However, information rarely fits neatly into a single category which leaves it up to the analyst’s discretion to decide how to categorize the information. Therefore, frameworks should offer a certain amount of flexibility in how the problem is framed and implemented that does not rely on arbitrary categories. While this line of thinking runs contrary to how the policy field typically operates, “designing programs that can be adapted more readily and that do not have large numbers of interconnected parts will, in the long run, be more successful than more rigid programs” (Peters, 2018). Flexibility within policies and programs allows for the solution to

adapt to the problem. Flexibility also allows policymakers to choose from a smaller list of frameworks because flexible frameworks can be applied to a variety of policy areas.

One of the main findings from the literature review is that despite the fact that there are frameworks for virtually every policy field, their use is relatively inconsistent and unpredictable. There is no clear consensus on their effectiveness. The main purpose of policy design strategies and frameworks is to aid policymakers in the process of analyzing problems and generating a list of policy solutions from which they can choose. Despite the wide variety of frameworks, “their use is differentiated and, on the whole, very limited, in particular when it comes to more advanced tools” (Nilsson et al., 2008). A potential hypothesis is a general disconnect between scholars and practitioners. Several articles surveyed for the literature review noted the lack of discussion between researchers studying frameworks and the policy professionals using them (Peters, 2018; van Geet, 2021). All seven of the articles accepted using the search term “policy frameworks” focused on specific subsets of policy areas like deep decarbonization, marine ecosystems, and the promotion of healthy lifestyles (Johansson et al., 2021; Holah et al., 2022; Lobczowska et al. 2022). Therefore, these studies and the frameworks analyzed do not easily lend themselves to policymakers in more general fields. The disconnect between the desired states and the tools available to achieve those states leads to “design incoherence, inconsistency, and incongruence” (van Geet, 2021). The question, then, is whether there are more effective tools for policymakers to determine how to move from the current state to the desired state.

Overall, the picture painted by the literature is concerning. While our team initially sought out efficacy studies for some of the common frameworks, such research appeared minimal at best. This speaks to the disconnect between theory and practice (Peters, 2018; van Geet, 2021). It seems as if the frameworks most often chosen by policy professionals are not chosen based on any kind of efficacy test. Moreover, it is unclear how prevalent the hyper-specific frameworks discussed in the literature are in practice. Therefore, the remainder of this paper summarizes our research that sought input from policy professionals themselves about the frameworks they use and the perceived effectiveness.

Data and Methodology

Survey Design

As discussed above, little is known about the prevalence and effectiveness of framework use in the field of public policy. After conducting an exhaustive literature review and investigating curricula from many public administration programs it is clear that this lack of understanding exists across both the academic literature and within professional programs designed to teach future policymakers. Of greater concern is that analytical tools and frameworks remain a staple of public administration programs, despite this information gap (see Cleary, 1990; Mackey III, 2015). In order to bring a degree of clarity to the issue and to provide a platform for further research, a study was designed to gain a better understanding of the use of frameworks in the field. Specifically, this research extends the literature by providing a quantitative assessment of the prevalence and effectiveness of frameworks among practitioners in the field of public policy.

The primary objective of the survey was to provide cross-sectional data on the use, understanding, and effectiveness of frameworks in the policy field, but constraints and advantages associated with the state of the literature, field, and technology also played a role in survey design. These constraints include limits on access to policy practitioners as well as limits on their time to participate in academic studies and surveys. This hurdle was mitigated by employing a survey hosting platform called Alchemer and disseminating through a platform called Mturk. This approach enabled specific targeting of potential respondents based on professional role. Further, the overall design of the survey was intended to be direct and as brief as possible without limiting usefulness, in order to mitigate the possibility that respondents would “burn out” and leave the survey unfinished. This was accomplished by using Likert scale-based questions whenever possible, by reducing unneeded or partially relevant questions to the greatest degree possible, and by building the architecture of the survey using question logic so that certain questions were only asked to respondents with specific answers to preceding questions.

Another inherent challenge was the construct validity for the word “frameworks,” because of inconsistent use of the term in the state of the field and literature. As noted in the literature review and in Fuqua et al. (2021), there are many vague and often contradictory definitions. The survey mitigated this concern by providing both a fairly broad initial question and providing clarifying examples. Additionally, we provided substantial room for respondents to clarify their own understanding that we were then able to code for later in the process. Similarly, understanding what makes a framework “effective” is subjective and not well established in the literature or in practice. To mitigate this concern the survey relied on personal interpretations and as great a degree of description and perspective sharing as could be accommodated. This allowed our coding team to accommodate a large spectrum of perspectives while permitting pertinent analysis to be both quantitative and qualitative.

Working within these constraints in order to accomplish the objective of a full view of frameworks used in the policy field, a survey asked initially for age, education level, and professional field to ensure a relevant sample of policy professionals. Further questions assessed the organizational type and professional role within the organization. These questions used either open-ended or dropdown formats, where appropriate, and provided open-ended “other” choices when dropdown formatting was used. A binary yes/no question then asked “Do you use any decision-making frameworks in your professional role? (Examples include: cost-benefit analysis, SWOT, logic models, force field analysis, etc.)” and then provided room for further explanation of the decision-making process, regardless of whether a framework was used. Further questions then sought to assess the perceived effectiveness, adaptability, training difficulties, and other qualities associated with the decision-making process used. These questions employed a Likert scale to allow for a simple and concise user experience that encouraged a high level of engagement.

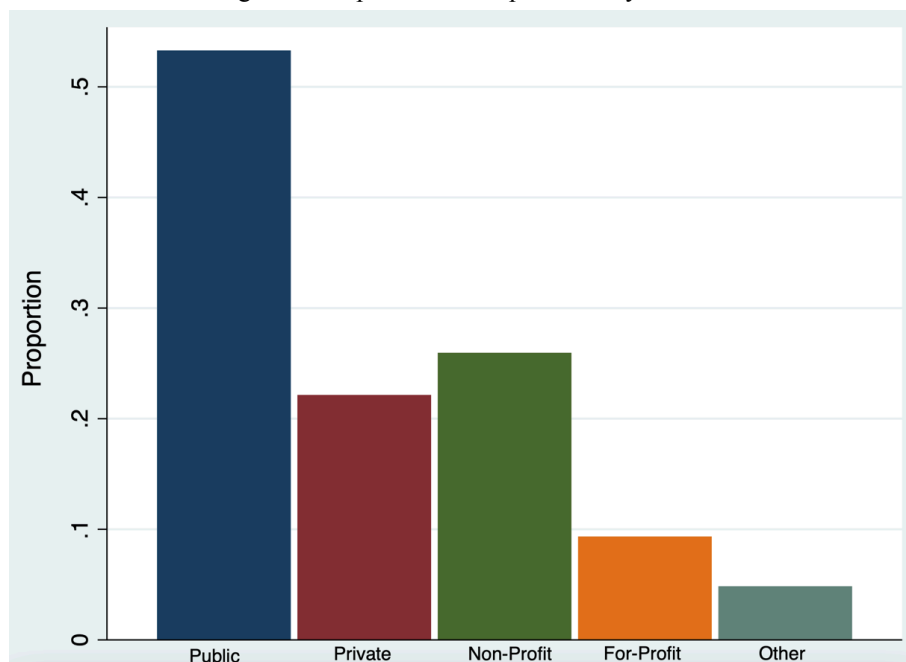
Survey Sample

A total of 500 surveys were returned, of which a total of 286 were viable. As a whole, the sample is a diverse representation of those that participate in the formulation and implementation of policy, including both private and public organizations. Background, education, and professional fields showed substantial variation that encourages and enables a broad and holistic view of public policy and, with 286

respondents, the sample size supports conclusions that are generalizable and universal across demographics and survey categories.

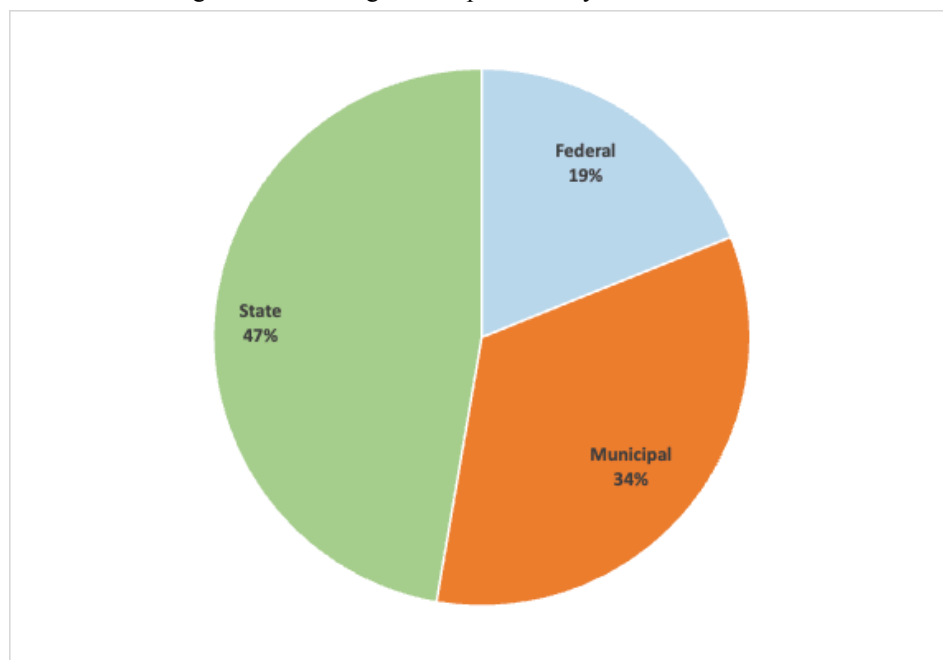
Of the 286 viable entries, 53.3% worked in the public sector, 22.1% worked in the private sector, 26.0% worked in non-profit organizations, and 9.3% worked in for-profit organizations (Figure 1).

Figure 1: Proportion of Respondents by Sector



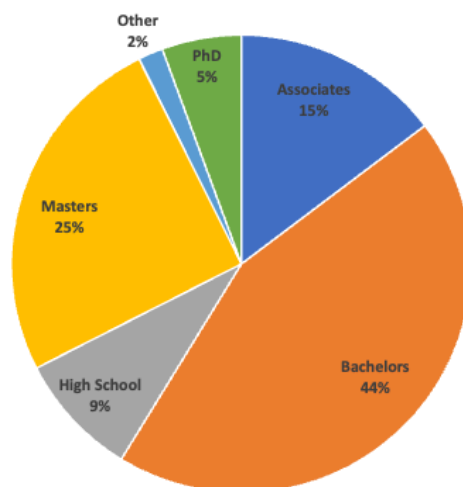
Of those in the public sector, 18.9% worked at the federal level, 33.8% municipal, and 47.3% at the state level (Figure 2).

Figure 2: Percentage of Respondents by Jurisdiction Level



Eligible respondents were limited to those with at least two years of college and of the 286 respondents whose responses were complete, 9% had a high school diploma, 15% held an associates degree, 44% had a bachelors degree, 25% had a masters degree, 5% had a doctorate, and 2% answered “other” (Figure 3).

Figure 3: Percentage of Respondents by Educational Attainment



Research Findings

Who is using frameworks?

A primary goal of this research was to understand if policy professionals are using frameworks to guide their decision-making processes, whether they find these processes effective, and what is driving their framework use. Surprisingly, 46% of the 286 policy professionals in our survey did not use a framework at all. Of those who do use a framework (N=154), 53% used CBA, and 19% used SWOT. Those two frameworks are the most common frameworks used by policy professionals today.

Additionally, 43% of those who did use a framework identified one that was neither CBA nor SWOT. (Since respondents could report using multiple frameworks, the percentages of those who used SWOT, CBA, and “other” frameworks do not add up to 100%.) These “other” frameworks are extremely varied and specific to the professional’s policy area. Other than CBA and SWOT, no other single framework is used by more than 10% of professionals who use frameworks. These statistics are summarized in Table 1.

Table 1: Summary of Framework Use in Surveyed Professionals

Framework	Freq.	Percent (of all respondents)
No	132	46.15%
Yes	154	53.85%
Most Common Frameworks	Freq.	Percent (of those who used frameworks)
SWOT	29	18.83%
Cost-Benefit Analysis	81	52.60%
Other	66	42.86%

Another area of inquiry was the perceived level of effectiveness that respondents reported about the frameworks identified. In other words, we asked, are professionals finding their use of frameworks effective? A regression model showed that there was no statistically significant relationship between framework use and the professional’s perceived effectiveness. Furthermore, the majority of respondents indicated that their decision-making processes were “mostly effective,” which was the second highest rating that they could have chosen. Table 2 shows the mean effectiveness score for different cross-sections of our survey respondents based on whether they used a framework, and what frameworks they used if they did. Almost all respondents rated their decision-making processes 4 out of a maximum of 5 points.

Table 2: Average Effectiveness Ratings of Survey Respondents by Framework Use

How effective is your decision-making process? (5 = Very Effective. 4 = Mostly Effective. 3 = Neutral. 2 = Somewhat Effective. 1 = Not Effective)					
	All Respondents	Used Framework	Did Not Use Framework	Used CBA	Used SWOT
Mean	3.92	3.91	3.93	3.76	3.85

How are professionals making decisions without frameworks?

Choosing not to use a framework does not necessarily mean that the professional does not have any decision-making processes whatsoever. In our survey, those who reported that they did not use a framework were asked to qualitatively describe their decision-making processes. These descriptions were coded into five separate themes in an effort to improve inter-rater reliability. These themes were:

- 1) Hierarchical (respondents mostly deferred to their supervisors);
- 2) Intentional (respondents showed intentionality in their decision-making processes);
- 3) Improvisational (respondent mostly followed their gut reactions);
- 4) Data-driven (respondents primarily relied on using data, statistics, or spreadsheets); and
- 5) Teamwork (respondent makes decisions by discussing as a group with other coworkers or stakeholders).

Table 3: Distribution of Decision-Making Themes For Those Who Did Not Use a Framework

Decision-Making Theme	Freq.	Percent
Hierarchical	36	21%
Intentional	38	22%
Improvisational	47	28%
Data-driven	16	9%
Teamwork	32	19%

These themes in Table 3 show that professionals who did not use a framework still used many formal or informal processes in their decision-making. However, similar to professionals who do use frameworks, professionals who identified specific decision-making processes did not feel that their processes were related to perceived effectiveness. In fact, our regression model (Table 4) shows that only

processes characterized as hierarchical impacted perceived effectiveness which had a large, statistically significant, negative correlation with perceived effectiveness. In other words, professionals only found that their processes were anything less than “mostly effective” when they were removed from the decision-making process altogether.

Table 4: Regression Table of Perceived Effectiveness on Decision-Making Theme

Perceived Effectiveness	Coefficient	Std. err.	t	P>t
Hierarchical	-0.4216939	0.1403853	-3	0.003*
Intentional	0.0991352	0.1457914	0.68	0.497
Improvisational	0.0961674	0.1258273	0.76	0.445
Data-driven	0.3472855	0.2016443	1.72	0.086
Teamwork	-0.0615362	0.1510791	-0.41	0.684
_cons	3.930135	0.0604014	65.07	0
Adjusted R-Squared	0.0355			
N	268			

What's driving framework use?

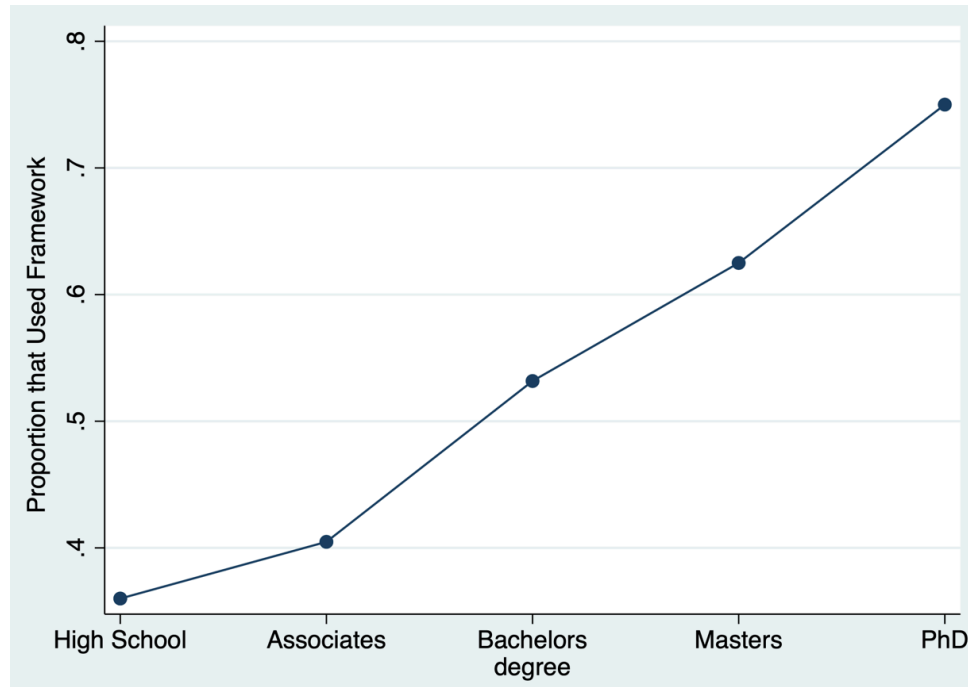
Linear regression analysis showed that there seems to be no correlation between framework use and the sector of the professional (public, private, nonprofit, or for-profit), or their level of jurisdiction (local, state, or national). Other than environmental policy, there was also no correlation between the professional's policy area and their likelihood of using a framework. Rather than their industry or policy field, the single greatest driver of framework use for professionals was their educational attainment. In our regression model, every additional degree is associated with a 10% increase in the probability of the policy professional using a framework, as shown in Table 5.

Table 5: Linear Regression of Framework Use on Educational Level

Used Framework	Coefficient	Std. err.	t	P>t
Degree Level	0.0994434	0.0294586	3.38	0.001
_cons	0.2312309	0.0942929	2.45	0.015
Adj. R-Squared	0.0358			
N	281			

This relationship is highly statistically significant, with a p-value of 0.001, and it is particularly striking when visualized as a graph (Figure1), showing that each degree is associated with a large increase in framework use. Further regression models showed that there is a statistically significant relationship between educational attainment and using CBA and SWOT; a relationship does not exist between educational attainment and the other niche frameworks. This relationship may indicate that these two frameworks are the most widely taught frameworks in universities today, despite them not having a significant impact on the perceived effectiveness of decision-making processes.

Figure 4: Comparison of Framework Use and Educational Attainment



What do policy professionals look for in a framework?

The final section of our survey asked policy professionals to rate their decision-making processes based on certain criteria, such as whether it is easy to implement and whether it takes into account multiple perspectives. We then ran a linear regression of the perceived effectiveness of their overall decision-making process against these criteria. In doing so, we are able to understand the key criterion that a professional believes would increase the effectiveness of their decision-making process or framework. The results are shown below.

Table 6: Linear Regression of Perceived Effectiveness On Key Criteria
(1 = Strongly Disagree. 10 = Strongly Agree.)

Perceived Effectiveness	Coefficient	Std. err.	t	P>t
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It supports multidisciplinary approaches to the problem.	-0.00835	0.02370	-0.35000	0.72500
Training for the process is expensive.	0.02216	0.01943	1.14000	0.25500
It meets the needs of my constituents.	0.11206	0.02462	4.55000	0.00000*
Software/materials for it are expensive.	0.02425	0.01815	1.34000	0.18300
It is easy to implement.	0.06588	0.01997	3.30000	0.00100*
It is too complex.	0.00819	0.02637	0.31000	0.75600
It allows one to frame issues or problems comprehensively.	0.02356	0.02079	1.13000	0.25800
The process is difficult to learn.	-0.02595	0.02931	-0.89000	0.37700
The process is difficult to teach to others.	0.03624	0.02564	1.41000	0.15900
The process is adaptable to different contexts.	0.01141	0.02197	0.52000	0.60400
It allows one to identify and acknowledge perspectives, mental models, assumptions or bias in the problem frame.	-0.00075	0.02010	-0.04000	0.97000
It is not applicable to the issue(s) I am working on.	-0.04027	0.01715	-2.35000	0.02000*
There are too many steps involved in the process.	-0.01441	0.02574	-0.56000	0.57600
It's hard to get participation in the process.	-0.05046	0.02106	-2.40000	0.01700*
The process involves both quantitative and qualitative data collection.	-0.01433	0.01724	-0.83000	0.40700
Too much time is required to implement the decision-making process.	0.02747	0.02112	1.30000	0.19500
The process balances the complexity of variables involved in my decision-making.	0.03935	0.01857	2.12000	0.03500*
There is an active and accessible community of practitioners that use the process.	0.00513	0.01571	0.33000	0.74400
_cons	2.23877	0.21243	10.54000	0.00000
Adjusted R-Squared	0.36			
N	253			

As Table 6 shows, the main criterion that a professional would look for to decide whether their decision-making processes are effective is if it serves the needs of their constituents. Additionally, concerns regarding ease of implementation, applicability to a particular policy issue, how participatory the process is, and whether the framework is able to balance the complexity of variables in their field were identified as important. As we will discuss in the section below, we believe that Systems Thinking, and particularly the Agent Based Approach (ABA), can help address these concerns by helping professionals understand and respond to the complex adaptive systems they exist in.

Discussion

As both our literature review and survey analysis shows, there is a disconnect between theory and practice in the policy field. Though many frameworks are offered by researchers and academics, adoption is low, with only 54% of professionals identifying the use of a framework. In addition, many of the most common frameworks in use have not been sufficiently vetted for their efficacy (especially CBA and SWOT). Furthermore, frameworks being used by policy professionals are often so specialized that they are useful only in a small range of applications.

Frameworks such as SWOT and CBA, which the majority of our survey respondents used, do not necessarily increase practitioner satisfaction with their decision-making processes. Despite being “general use,” these frameworks lack the strength to adapt to individual circumstances and the reality of the wicked problems faced by policymakers.

Our research shows, with high statistical significance, that educational attainment (as measured by degree type; see Figure 5) increases the likelihood that a policy maker uses a framework. This indicates that frameworks may be a component of policy curricula in advanced degree programs. An alternate hypothesis is that advanced degree programs more explicitly train students to use frameworks, and our survey results could reflect a greater *awareness* of framework usage by policymakers with advanced degree attainment, rather than a greater likelihood of using frameworks. Regardless, our research shows that framework use—in particular CBA and SWOT—is a result of education in policy studies.

Our research also sheds some light on the elements that policy professionals are looking for when applying a framework. Our research shows that policymakers judge the merit of a framework based on its ability to meet the needs of constituents, ease of implementation, applicability to the policy maker’s field or problem of interest, ability to engender participation from other stakeholders, and whether or not the framework adequately accounts for complexity. Many of these elements are subjective or are based on an individual policymaker's perspective, rather than an empirical study of the framework. Indeed, our research showed that the main reason a policy professional would believe that their processes are less effective is if the decision-making power is taken out of their hands completely, such as if they have to defer to their supervisors. These patterns hardly suggest an intentional, systemic decision-making process that aligns policy-makers with the reality of the issues that they face.

This fragmented landscape of framework-use and decision-making processes by policymakers highlights the importance of effective, empirically vetted frameworks that are applicable in a wide range of policy settings. Although there are exceptions, the vast majority of policy issues and policies themselves, are attempting to intervene and effect change in systems that would be described as complex adaptive systems or CAS. Therefore, not only must policy models be vetted for the factors mentioned above, but also should be vetted for the kinds of systems that policy makers are attempting to change.

A CAS has different parts simultaneously interacting, called agents, and those agents are acting through simple rules in the system, creating emergent properties that describe the behavior of the entire system (Mulyono, Sukhbaatar, & Cabrera, 2020). Those interactions of the agents of the system are also making it adaptable to the stimulus it receives, which means that the systems are constantly adapting, evolving, and growing.

CASs are everything surrounding each and every one of us; the social security system, the educational system, and the public security are CASs that we may identify as complex at the very moment we try to understand them, but CASs are also seen in everyday life such as the traffic we encounter while driving home after work, the classes we take in school, the sports we like to watch, or a community garden. This list can be endless.

Policymakers and practitioners are often facing CASs, without knowing they are a CAS. However, they are aware that proposing a policy is not going to be a simple process. The term “wicked problem” becomes relevant when discussing CASs. Rittel & Weber (1973) refer to the wicked problems as having five characteristics. i) They are not formulaic, which means there is no one single solution for them, ii) They have fuzzy boundaries, the problem is interconnected with other problems, and with other systems, iii) It is intractable, there is no guarantee that the problem can be fully solved, iv) It has human costs, humans may be affected directly or indirectly from the problem, and v) It has multiple perspectives. These criteria apply to many (if not all) of the most pressing problems faced by policy makers today. For example, a policy proposal on housing availability may touch on areas of social wellbeing, market prices, public safety, and family income. Knowing the concept and theories behind housing policy may be of importance to avoid creating an irrational policy, but more importantly, being aware of how the system’s agents operate and interact in these CASs could prove beneficial for the policy proposal integrity in achieving the necessary changes it is offering.

The tool most commonly associated with a CAS approach and known as Agent Based Modeling or ABM. However, ABM is a rigid framework, and lacks flexibility to adapt to changing situations. ABM requires you need very specific parameters and variables which often do not exist for the systems that policy makers study. For many CASs we don’t have the level of specificity that allows us to program it. We may not even have terms with enough construct validity to quantify and program them. This can be because the system is opaque—it does not reveal enough of its specificity. And also may be due to the condition of knowledge about the system being quite low—meaning we don’t know much yet. This is quite often the case with big CASs like the ones policy folks deal with every day. There is no doubt that ABM is a very powerful method. One of the most powerful. But, we often don’t have what it takes to do an ABM, and sometimes we shoehorn it as a method, prematurely. ABM is often an infeasible choice (Mulyono, Sukhbaatar, & Cabrera, 2020) for several reasons:

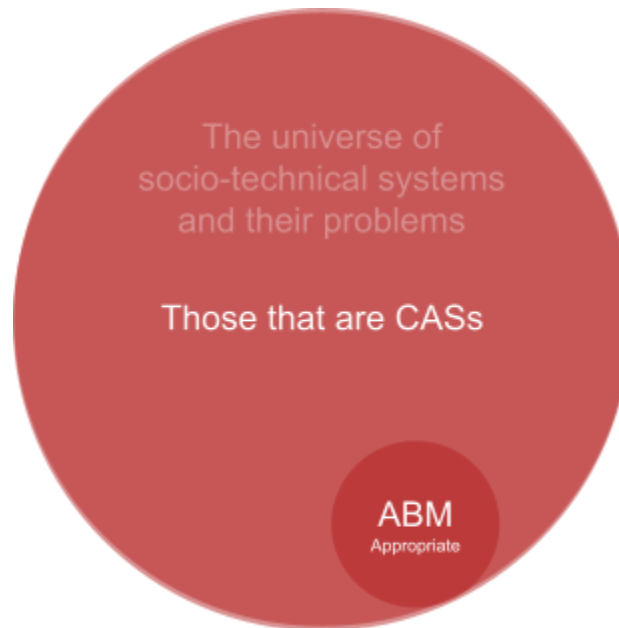
1. **A level of specificity is required that is often not available:** ABMs tend to be very specific. ABMs often cannot be generalized. They require specific parameters detailing specific purposes;
2. **This specificity often yields construct validity problems:** Generally speaking, all aggregate results of an ABM are only as good as the construct validity of the agent and rule inputs. Sometimes it is difficult to define the variables that must be defined. ABMs involving human or animate agents may have difficulty capturing irrational behavior, subjectivity, and complex psychology because these "soft factors" are difficult to quantify, calibrate, or justify; and
3. **The technical nature and expense is often impractical:** ABM analyzes the system at the level of its constituent agents and rules, not at the aggregate level. To develop a simulation of all the heterogeneous agents can be extremely time, skill, and/or resource intensive. The human costs in variable specification, construct validity, and programming is often prohibitive. Although technology has significantly lessened the computational costs, the high computational requirements of ABM when modeling large systems are still a serious issue.

The problem is, just because we may not be ready for an ABM, doesn't mean that another option "CAS-friendly" method shouldn't be utilized. Cabrera (2022) explains that, to solve this disparity, we must therefore take an Agent Based Approach (ABA) when dealing with complex systems, issues or concerns. The number of cases where CAS is applicable far exceeds the number of cases where ABM is feasible. Take for example this circle representing The universe of socio-technical systems and their problems. And a near entirely overlapping circle which represents those systems which are also CASs. Of those, the ones that are appropriate for ABM are relatively small. And that leaves a lot of CAS-based socio-technical systems that are in need of a method (Figure 5).

Figure 5: CAS systems far outweigh feasibility of ABM methodology (Mulyono, Sukhbaatar, & Cabrera, 2020).

$$\frac{\text{number of cases where ABM is feasible } (F)}{\text{number of cases where CAS is applicable } (A)} = F \ll A$$

Figure 6: The Need for an Agent Based Approach (ABA) (Cabrera, 2022)



The types of problems, issues or conditions policy makers are dealing with are frequently opaque and fluid, with a multitude of variables, which makes modeling policy solutions using ABM often infeasible. In this case, a similar but more feasible approach is needed as a replacement or predecessor.

The Agent-Based Approach (ABA)

The Agent-Based Approach (ABA) is a stepwise methodological process that helps to conceptualize CASs with the goal of formulating recommendations (Mulyono, Sukhbaatar, & Cabrera, 2020) that meet the complexity of the issue itself. The steps to ABA are as follows:

STEP 1: DSRP Systems Analysis

The purpose of the DSRP Systems Analysis is simple: to understand the system. The importance of understanding the intricacies and complexities of a system goes without mention, particularly when it comes time to formulate decisions and policy. Although, it is not uncommon to start with problem solving, which is a form of bias that should be preceded by a deep understanding (and mapping) of the system. Under the ABA, a practitioner is guided using the DSRP rules². These rules measure and map distinctions, systems, relationships, and perspectives surrounding a problem. DSRP rules ask how

² To understand the wicked problems and the CASs around us we can use Systems Thinking cognitive rules, or *DSRP*, the name given by its authors Cabrera and Cabrera (2015). *DSRP* stands for Distinctions, Systems, Relationships, and Perspectives. We have done them since we were little kids when distinguishing between the food that we did like or the ones we did not (Distinctions: Identity and other) or if our bookbag had everything we needed for school, books, notebooks, pencils (Systems: Parts and wholes); while also watching how our classmates interacted with each other (Relationships: actions and reactions) and how our parents or caretakers saw our success or failures in class in relation to our grades, while some of us just wanted to avoid any conflict with them for the grades (Perspectives: points and views). Explaining the DSRP can go from something as simple as going to school as a kid to explaining the most complex systems that policy-makers face on a daily basis, precisely because these simple rules of DSRP are cognitive rules that are applicable universally to fields of work.

individual elements within a problem relate to each other, how individual relationships impact the end goal or stagnate the process, and how perspectives shift mental models to conform to the reality of a situation or problem. Mapping out parts of the system in relation to the whole, and finding gaps of knowledge increases the level of understanding the policy professional has about any system. This process makes use of DSRP (D. Cabrera & Cabrera, 2015), Fropping rules (*Fropping Rules*, n.d.), and structural predictions (D. Cabrera & Cabrera, 2022) as well as DSRP systems mapping techniques. The output of this step is a map of the system.

STEP 2: POSIWID Analysis

A key component of ABA includes a concept developed by Stafford Beer called POSIWID which stands for “The purpose of a system is what it does” (Cabrera & Cabrera, 2020). It is based on the premise that a system often functions differently than it was intended to. The outcome the system achieves in reality functions as the actual purpose. With a POSIWID analysis, the practitioner can state the actual purpose of the system and the desired purpose that the system should have. This POSIWID analysis disassembles preconceived notions or social labels that are tied to organizations and decision making processes. It seeks to find the root source of an issue, and not accept the status quo. If a system is fragmented, POSIWID declares that such a system is broken. POSIWID can be thought of as a reality check, that lies contrary to the proposed function of a system. Humans are the weakest link when it comes to the decision making process, and despite society’s best intentions, policies often do not solve their target issue. POSIWID in the policy field declares how a policy actually impacts constituents, not just simply the proposed goal of the policy. A POSIWID analysis is a general analysis of the systems emergent properties and/or behaviors, and reveals the discrepancies that policies both seek and claim to solve. This step includes a *root difference analysis* which compares the actual and desired POSIWID statements and looks for the root differences between them.

STEP 3: CAS Analysis

Another step in the ABA approach includes a CAS Analysis where the agents of the system are identified along with the simple rules they follow when interacting in the system (current and future state). This CAS analysis details the salient agents in the system and the simple rules they do or should follow (current and future). These simple rules are often used as a basis for the recommendation rubric and in the recommendations themselves.

STEP 4: Rubric & Recommendations

Finally, with the understanding made from mapping the system with the DSRP rules and the simple rules the agents of the system follow, the practitioner should be in a better position to first create a rubric for the recommendation and finally, in all of the practitioner's creativity and understanding, offer a set of recommendations while following the rubric already made.

This is an approach that is simple to implement. It analyses the structures of the system instead of simply policy areas, the money it will require, or implementation steps. In this case, ABA offers a great level of relevance for practitioners because it is content-agnostic. It can therefore be applied to a wide

variety of fields and systems, it is universal in the stepwise process, while also being able to take into account complex structures. It helps in the understanding of any field, system, or CAS because it does not focus on rigid categories that will only serve certain purposes as with other frameworks. The most common frameworks used often fail to understand how interconnected the systems and big problems are with one another. For a more in depth treatment of ABA see Mulyono et al., (2021), and Cabrera (2022). In addition, various case studies of ABA exist (e.g. Bista, 2022; Bond, 2022; Karnuta, 2022; Ortega Gonzalez, 2022; Wilson, 2022).

Conclusion

Our survey suggests that roughly half of our respondents use frameworks to generate and or analyze policies in different fields. This also means that roughly half of policy professionals *do not* use frameworks, but rely on other types of decision-making processes. Even more surprisingly, respondents were largely convinced that their decision making strategies were “mostly effective” despite a resounding lack of proof that frameworks or any other decision making method is effective in practice. There is an alarming gap in the knowledge about what framework to use when developing policies and if it is effective in solving the issues that the policies are called to solve. Further, level of education is directly related to the knowledge of specific frameworks to use, and people with more education tend to use frameworks specific to their fields than the ones commonly used by people with less education, despite the lack of proven effectiveness in most use-cases.

The overall lack of evidence regarding framework effectiveness in designing policies calls for more research that can test a range of the most common frameworks and establish a more coherent and comprehensive understanding of their effectiveness in both general use and in specific fields. While our research focused on the perception of effectiveness, future study should evaluate the actual effectiveness of decision making processes in the policy field. This will require a selection of specific policies, analysis of how they were designed, and an evaluation of the policy outcomes. Future study should also analyze the effectiveness of ABA as it is a promising tool for policy makers and analysts because it is designed to address wicked problems in a VUCA world where policy makers must contend with complexity and a multitude of other obstacles to effective policy implementations.

The lack of consensus on framework prevalence and effectiveness is concerning. We currently rely on either the rigid structures of common frameworks such as CBA and SWOT or the specificity of less common frameworks. Our survey results guide us to the question: how and why are we letting the future of our families, communities, and country be determined by an ad hoc policy making process with little evidence on how to effectively address wicked problems? We need a better process to develop better policies.

The sheer volume of frameworks found in the literature review suggests that the current answer to more complex problems is more complex frameworks. However, changing the current state of our world requires more than a framework. ABA is a method for analyzing a system that allows for the identification of the agents of the system, the rules they follow, and the collective dynamics that result in

the system behavior. This approach engenders policies focused on changing the behavior of agents in the system or the simple rules of their behavior in order to bring about systemic change.

ABA is content agnostic which means it can be applied in any field and keep up with the complexity of variables that are constantly evolving. To fill the gap between the need for a universal and adaptable framework and the complex problems, we must use a universal and adaptable method that can aid in understanding the systems and offer comprehensive recommendations based on how they operate.

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