Political Science Integrated Analysis Model (PSIAM):
The Search for the Holistic Grail
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ABSTRACT

This paper advocates and justifies using modern communications theories, social networks, decision trees, contingencies, vector mechanics, and temporal theory to create an interdisciplinary, integrated model that can analyse and forecast political decision-making and policy implementation. It improves on the current state of modelling in that it establishes a unified, interdisciplinary framework that can be easily understood, logically validated, and readily applied to model political decision-making and policy implementation processes regardless of their length and complexity. The proposed model also explains and leads to a more thorough evaluation of independent variables such as contingencies, policy traction, process inertia, momentum, the quality of a decision, the level of dedication to policy implementation, and the implementation trajectory. The proposed model also facilitates congruence testing, process tracing, and outcome predictions for the political decisions and policy implementation processes being examined.

Keywords: Interdisciplinary, political, politics, decision-making, policy, process, modelling, analysis
Foreword

In 2013, while writing on the First Clinton Administration’s flawed interpretation of the Yeltsin phenomenon from 1993 to 1997 (Hand, 2015), I ran into the issue of defining the levels of analysis. This is not new for political analysts, and so, I proceeded in line with Graham Allison’s approach in *Essence of Decision: Explaining the Cuban Missile Crisis* (Allison, 1971, pp. 28-38) But a problem arose. I had to define and fit the levels of analysis within a coherent, conventionally-accepted structure—a model—that fully and, within our discipline’s rules, correctly evaluated the processes involved.

Unfortunately, in working through Congruence and Process Tracing (Evera, 1997, pp. 58-74) I found that Allison’s work had not accounted for several social and qualitative factors (independent variables) that affected my subject. Historical processes, interpretation, misinterpretation, value judgements, and more were not accounted for effectively in conventional Political Science models. Eventually, I correctly determined that the *symptom* of excess independent variables suggested there was at least one more analytical level that Allison had not considered in his work. I also determined that to get at that newly-identified level, I would have to step into the integrated and interdisciplinary world. By including these previously unidentified factors in a unique model, I was able to prove that the Clinton Administration policy failure wasn’t simply a matter of perception and misperception as Robert Jervis writes (Jervis, 1976), but a combination of events and factors accounted for in other disciplines beyond conventional Political Science analysis.

However, the term ‘interdisciplinary approach’ has come to be known as the tag for evaluating a political process using independent, parallel, monodisciplinary investigations with a comparative evaluation of the results of each discipline at the end of the process. I sought, instead, to explore, explain, and evaluate the interactions that truly crossed the boundaries of the disciplines and affected the outcomes as the process progressed over time. I proceeded, as this paper shows, with a multi-disciplinary, integrated, Positivist approach.

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Problem

Since the 1960s, political scientists have worked to arrive at a holistic methodology for evaluating political decision-making and policy implementation. Within Politics, International Relations, Defence and Security Studies, and other fields there were aspects that held potential or had major impacts on how elites made decisions and how their bureaucracies implemented policy. Many political theories and models have been devised, each improving on some aspect not addressed by a preceding one. However, none of the models created has managed to address the holistic problem of what is, after all, the human process of governance. Human processes often possess an un-quantifiable aspect which
confounds our attempt to scientifically evaluate them, draw conclusions, and devise the rules of behaviour that should, unerringly, lead to a predicted outcome.

Truly ‘interdisciplinary’ models were conjectured to be the ‘cure’ for an ailing analytical system. But these models could not account for myriad human frailties and decisions. They often held within themselves the seeds of internal contradiction as well as the inconsistencies and incongruities between the disciplines used in the analytical model. The best result we have today is a form of Graham Allison’s ‘Levels of Analysis’ approach (Allison, 1971). But, with each ‘level’ representing a discipline-framed view on a subject, we actually have a parallel-stovepipe construct and not a truly interdisciplinary one. We have a ‘sum of disciplines’ approach.

Synthesis, if it exists in current ‘interdisciplinary’ analytical modelling, comes only at the end when the ‘sum of disciplines’ give us an answer and hopefully provide unique insights. The synergistic effects resulting from human processes are either captured or not captured only one slice at a time. Consequently, the mutually reinforcing interactions, strengths, and weaknesses in the ‘multi-disciplines’ approach to a problem cannot easily be shown. Recent work in the individual subfields of the Social Sciences, as well as concepts borrowed from other disciplines, can and should be used to, change this state of play.

In 2005, Alexander George and Andrew Bennett published Case Studies and Theory Development in the Social Sciences (George & Bennett, 2005), which is a milestone book for our discipline’s development. In this excellently-argued work, George and Bennett examine every aspect of Social Science investigations, including: case studies, forming hypotheses, theories, design and modelling, the philosophy of science, comparative methods, testing, process tracing and more. Case Studies and Theory Development is comprehensive in its scope and detailed in its explanations. Yet, there are still aspects of the human process we study that are not codified in the work, namely accounting for preference, perception, and quality in the actual decision-making process and policy implementation.

If we look at the process an elite uses to make a political decision, we find there are many aspects that are qualitative in nature. Robert Jervis covered many of these in his book, Perceptions and Misperceptions in International Politics (1976). (Jervis, 1976) In his book, Jervis makes the case that we already differentiate between the, “…”psychological milieu’ (the world as the actor sees it) and the ‘operational milieu’ (the world in which the policy will be carried out)…” (p. 13). Jervis goes on to say that even if we look at the Bureaucratic Process for the Level of Analysis, where decisions result from intergovernmental bargaining, then there must necessarily be an intervening interpretation from the actors that is based on their perceptions and beliefs about the situation (p. 25). Their perceptions and feelings about an issue will flavour their gamesmanship within the bureaucracies. This just one aspect of the more than twenty qualitative items Jervis correctly highlights as influences to political decision-making.

A symptom of the problem of modelling in Political Science is the resistance of a particular human activity to be quantified. Ever since the Behaviourists of the 1950s and ‘60s sought to measure human responses for evaluation and
prediction purposes, our discipline increasingly has applied quantitative methods to our activity. We have developed new and important ways to evaluate a subject’s performance. The ‘quantification’ of the Social Sciences has given us new insight into our own as well as our political elites’ actions. Quantitative Analysis has been largely successful. However, certain activities defy quantification. We see the symptoms of these processes when the data sets produced from our research lack connectivity, strong correlation, or have excessively large variance or standard deviations. Here, too, we attempt to cling to quantification as it offers us ‘empirical truth’.

Charles Ragin wrote two mathematics-based books to attempt to guide us through the quantification forest and address the problems of cause-and-effect, loose correlation, and large standard deviations. In *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies* (1987), Ragin lays out the mathematical Boolean Approach to conducting Social Science investigations. However, he also states that: (1) The Boolean Approach, “…can be made under conditions (for example, availability of a very large number of observations…” and (2) One of his primary goals was, “…to broaden the boundaries of methodological discussion by formalizing the differences between case-oriented and variable oriented research in comparative social science and other subdisciplines as well.” (sic) (pp. xi, xii) Effectively, Ragin is telling to use the right tool for the data available.

In *Fuzzy-Set Social Science* (2000), Ragin speaks to us about situations where the data correlation between independent and dependent variables, as well as grouping of the dependent variables, are weak (“Fuzzy Sets”). He takes the mathematical principles for quantitative analysis and applies them to diversity and other situations where the human activity resists measurement, coherence, and homogeneity. Ragin provides an example when he compares ‘state breakdown’ and ‘social revolution’. (Ragin, 2000, pp. 215-223)

Table 1. **Fuzzy Membership Scores**

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Fuzzy Membership in “Social Revolution”</th>
<th>Fuzzy Membership in “State Breakdown”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>41</td>
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<tr>
<td>2</td>
<td>.34</td>
<td>.69</td>
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<tr>
<td>3</td>
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<td>20</td>
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<td>.73</td>
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</tbody>
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*Source:* Ragin, 2000, p. 216
However, one should not be wholly converted to Ragin’s quantification methods. Even at this complex level of quantitative analysis Ragin, himself, clearly states that Fuzzy Set analysis has varying levels of correlation between the independent and dependent variables. (pp. 218-219) Thus, he gives us the caveat that Fuzzy Set methodology is only as strong as the strength of the correlation that can be measured.

Other aspects that deserve our consideration are both the nature and the context of the phenomena we examine. Jervis makes the case that the political decision an elite makes is made with a certain historical background and within an historical context at the point of decision. (Jervis, 1976, pp. 26-31) We realise intuitively that the policy implementation resulting from that decision is an event that begins at some point after the decision and continues throughout its life until fulfilment or abandonment. The common thread—time—in the decision-making and policy implementation processes, however, has not been examined for its influence on the ultimate outcomes. ‘Time’ and the resultant sub-elements and effects have been examined by Paul Pierson in Politics in Time: History, Institutions, and Social Analysis (2004).

Pierson makes several important observations about political processes that we should consider when we seek to model political decision-making and policy implementation. First, Pierson correctly states that the temporal element is ever-present and that an action at any point cannot escape its historical context (pp. 4-6). Next, that social processes develop and change over time, and have a path dependence. (pp. 20-22) There are also positive feedback (i.e.,
reinforcing) mechanisms, information transfers, trajectories, and slow-moving, momentum-driven processes. (Chapters 2 and 3). In sum, Pierson provides us the foundational framework to understand the development of our subject (political decision-making and policy implementation) on the stage in which it occurs. It is interesting to note that E. H. Carr had opened the discussion about time, history, path dependency, historical significance, contingencies, and temporal context along similar line almost 80 years earlier, during his lectures at the University of Aberystwyth. (Carr, 2001)

We should also note that neither Pierson nor Carr considered the relative quality of a decision and its implementation, nor the weight and direction of an action (be it decision, policy implementation or contingency) as it is applied to a decision or a implementation process. These are the last elements we must consider before we can adequately look from a Positivist view at the things that actually happen during the processes we seek to model. In Machiavellian terms, we must look at how the world actually works, not some idealised version of it, to be able to discern our path to analytical success.

In an interview in 2007, Sir Jeremy Greenstock, when retelling the story of his diplomatic involvement with the US and Russia cited the ‘quality of a decision’ and the ‘quality of a Presidential Administration’ as key factors in maintaining policy momentum. (Greenstock, 2007; Hand, 2015, p. 227) Additionally, looking at an action within a process (e.g., blocking, accelerating, or altering), or an outside influence (i.e., contingency) affecting decisions and processes can best be represented by a force ‘pushing’ the subject activity in a specific direction. This is the mathematical definition of a ‘vector’ (a force working through a point in a defined direction). Both the quality of a decision and the intervening contingency action have a measurable weight and work in a certain direction that either promotes fully, partially promotes (skews positively), partially retards (skews negatively), or retards, a policy implementation process.

Our preceding discussion has identified the significant issues we must address to create an appropriate model to evaluate the human processes of decision-making and policy implementation. But we have not defined the conditions under which such a model can be created. We know intuitively that modelling can only proceed if there is consistency in application and a lack of conflict between the elements used to create the model. This is why cosmologists and physicists can be mutually supportive. Each has a discipline-interpretation of reality that compliments and reinforces the other. Conflicting ideas in one area can, and often do, undermine the work in another. Although it is invidious to compare and link one profession with another, let us borrow a guiding principle from medicine, the first rule of which is, “Do no harm.” This applies to our actions in manipulating a model (our ‘patient’) in that whatever we devise must not have within it the seeds of its own destruction nor the causation of the patient’s death. Likewise, we should rely on the principle established by Occam’s Razor in that we will make only the most essential and basic assumptions necessary to continue. Taking these constraints and restraints into account, the following conditions appear to be logical:
a) The concepts and principles injected from one discipline must function logically within the target discipline;
b) The concepts and principles injected from a discipline cannot conflict with those of any other discipline used in creating our model.
c) The concepts and principles injected from a discipline must logically lead to an exploration and explanation of aspects of the human processes of decision-making and policy implementation that cannot be examined without the aid of the injection of the particular item.

Note that the last condition is of key importance. It excludes any approach that can be modelled by other means. This condition effectively ensures that we are capturing the synergy of interdisciplinary modelling from the construction phase.

In sum, the difficulty of creating our holistic, integrated, multi-disciplinary model has been that we have not been able to fathom the complexity and synergy of a truly integrated, interdisciplinary model. Instead, we have relied on the next best option, which is a ‘sum of disciplines’ strategy. However, with the recognised need for an interdisciplinary modelling system which integrates the activities throughout the process and the recent developments in the areas that can be foundation elements for such modelling, we can surely make an attempt at creating a better methodology and model within logical parameters.

The Model– Philosophy and Discussion

At this point, we must declare the environment and limitations within which we will construct our model. Much of what we have discussed has been documented and appropriately acknowledged. From this point forward, however, the result is an act of synthesis of ideas and concepts brought forth from the numerous areas surveyed. Where appropriate, citations and notes are used to denote the connections made by the original authors within their disciplines. The unique use of their concepts and ideas in linkage with other, complementary material from other great thinkers is purely the fault of this paper’s author. In short, this paper’s author is honoured to follow Bernard of Chartres’s example and “stand on the shoulders of giants” to offer what might be ‘the next step’ in our understanding of the subject material.

From the Positivist Perspective

First, it is instructive to look at political decision-making and policy implementation as it exists in reality—a form of communication between the elite and the masses. As such, modern communications theory holds sway. The visual representations of the Modern Communications Theory and its application to policy decision and implementation are as follows:
Next, the context and stage upon which all political decisions are made and policies are implemented is the one identified by Pierson – TIME. With a nod to predecessors like Carr, Pierson writes, “We are beginning to recapture one angle of vision that was deeply threatened by the decontextual revolution—a threat that raised the prospect of seriously distorting our understandings of social life. We are beginning, again, to place politics in time.” (Pierson, 2004, p. 178) If we consider Pierson’s points in *Politics in Time*, we have:

a) The precedents set for the actor, and the decision made with the knowledge of those precedents (pp. 4-5),

b) The progression of time (pp. 15, 16),
c) The decision within the temporal context (p. 16),
d) The resultant of the decision (policy implementation) (pp. 58-63),
e) The progress of the implementation toward its goal (pp. 63.64),
f) The creation of optional paths (Chap. 1),
g) The positive feedback mechanism (moving actions forward and negating choices to return and re-make decisions) and the self-directing nature of decisions (i.e., the Polya Urn process) (pp. 20-27, 69),
h) Reaching equilibrium along a set of options (i.e., trajectory as described by the Polya Urn Process),
i) Understanding the slow-moving social processes that affect policy implementation,
j) Accounting for path-dependence arguments (Pierson, 2004).

Consequently, we can begin to construct our model as shown:

**Figure 4. PSIAM Activity Trees (simple)**

At this point, we should acknowledge that our proto-model resembles a business and engineering methodology developed in the late 1940s by the US Navy called Program Efficiency Review Technique (PERT) Diagramming. This method, which was also referred to as the Critical Path Method, highlights decision points, options, and critical paths of action and resources. It is a quantification of the complex systems involved in a program so that a decision-maker can review resource allocation, key decisions, and time/process-queued decision points throughout the life of the process.
Finally, we must consider the aspects of contingency, decision quality, bureaucratic inertia, and other factors that skew the delivery of the policy objective.

So, we arrive at what is a lucid, Positivist look at what actually happens in political elite decision-making and policy implementation through a bureaucracy operating within a temporal context. We can now conceptualise not only the reasons, methods, and ways of making a certain decision, but we can also track their most likely path of progress, identify their relative strength, and evaluate the effects of contingencies that affect delivery of the policy. We have our first, interdisciplinary view of the processes from the geneses to the independent variables.
Discussion

With our model generally defined and in place, we now discuss the operation of the parts.

(1) Modern Communications Theory

Within the framework of the decision-making and policy implementation processes, the decision of the elite is an idea and the policy-implementation is essentially a communication’s message as it is transmitted through a medium. In our case, we consider the policy-implementation mechanisms as the medium. Modern Communications Theory also teaches us that the decision-maker has a personal environment, social network and derived values (Gould, Roger V., 2003), and history that plays a role in the framing of the message (and, as Pierson points out, in the formation of the decision). (Pierson, 2004, pp. 4-5) This communication occurs within an environment, which has its own qualities, and which will influence the processing of the message through the medium. We should note that this communications process takes place over time, and that this temporal dimension can be very lengthy or concise depending on the level of complexity of the transmission, issue, and environmental issues.

(2) PERT/Critical Path Method Diagramming

When delivering our decision-maker’s idea through the medium of the policy-implementation bureaucracy, we need to account for the various interceding points of review, sub-process completion, sequencing, and intermediate resultant activity. When visually represented, these activities can best be represented by the Program Tree in PERT/CPM Diagramming. Doing so also allows us to account for the possibility that there are options for the decision-maker to consider when communicating the same message. The PERT/CPM Program Tree functions as an Intermediate Activities Tree for the purposes of modelling. It has the capacity to act as an identification and evaluation tool for the resources, path, and milestones of the policy’s implementation process. Consequently, the Activities Tree can be both a means of evaluating the different steps required in the transmission and adaptation of the policy for the political analyst studying an historical case anda predictive tool for the decision-maker to consider as part of the policy gaming that occurs when making a decision. For this paper, we will remain focused on the former.

(3) The Environment and Contingencies.

Consistent with the earlier discussion of the temporal environment and its factors that affect the decision-maker and decisions, we must include that unrelated processes and activities—contingencies—can, and often do, impinge on the processes described in the Activities Trees. Their impacts can be located within the temporal model of the Activity Trees, and the relative weight and
Direction can usually be identified at the point of impact. This is a key point for our model, because we can easily see the mathematical concept of vector mechanics coming into play.

(4) Vector Mechanics.

In mathematics and physics, a vector is a force acting on a point in an identified direction. This is a critical concept for our modelling in that it provides us a means for evaluating qualitative issues in a more quantitative and consistent way. The contingency affecting an activity at a point can be described as retarding, accelerating, or skewing the activity and the subsequent path. The degree, or amount, of the change will correspond with the level of force of the contingency. For example, a small retarding contingency that works against a policy implementation process will have a retarding effect, but not stop the process, where a large retarding contingency could stop the process altogether. By extension, an accelerating contingency will reinforce and speed up the process (However, if a major reinforcing contingency occurs, it may push the implementation activities out of synchronisation—creating an imbalance and resulting process retardation). Finally, a skewing contingency may force the Activities Tree to deviate laterally and create new processes to re-align with the originally-projected tree. In more severe cases, a major skewing contingency can force the Activities Tree to overlap the processes described in an alternative tree or, in the most extreme cases, stop the policy implementation altogether by cutting the process in-flow.

There is, however, one last form of vector to consider—the inherent vector. This is the vector that is an internal part of the decision-maker, the ongoing implementation process, and/or the bureaucracy involved in the intermediate activities. This vector is not a “contingency” because it is directly related to the decision and implementation process. Specifically, the inherent vector addresses the quality (e.g., strength of commitment, willingness to commit resources, “buy-in”, and directional aim) of the elite as well as the bureaucracies involved in the intermediate processes.

Using these four classes of vectors, we can account for non-quantifiable issues such as the quality of a decision, the commitment to a policy, bureaucratic inertia, and more.
(5) Activity Tree Stability

As we have the Intermediate Activities Tree and the vectoral nature of contingencies accounted for, we should now consider the Positive Feedback Mechanisms Pierson highlighted. (Pierson, 2004, pp. 20-27, 69) Pierson appropriately highlights two factors that lead to process stability as it progresses—Positive Feedback and the Polya Urn process.

Positive Feedback exists because when a decision is made and executed within the temporal flow it cannot be ‘un-made’ without loss of resources and momentum. Even one step down the temporal path, returning to the same point and making a different decision or activity choice is difficult. This difficulty multiplies the further along the tree one goes. After several iterations, returning to the original point becomes nearly impossible because time has progressed and the conditions for returning to the same decision point no longer exist.

The next factor for Activity Tree stability comes in the form of the Polya Urn Process. In this statistical process, the selection of an option in a range of options becomes self-reinforcing through replacement. The Polya process uses a model that represents options by coloured marbles, the selection and addition of which over time ultimately result in a homogenous sample of only one of the original two options. For the purposes of our model, this is the equivalent of increasingly narrowing alternative paths until we have a distinct and unique Activity Tree progressing through time.

Positive Feedback and the Polya Urn process reinforce Activity Tree processes in a mutually-supporting manner. The interaction of these concepts allows us now to describe and evaluate trajectories in the policy implementation process.

(6) Sequencing, Path Dependence, Process Tracing, and Congruence Testing.

Revisiting the visual representation of our model we can see that issues of temporal order, dependence, and the equivalency of condition between temporal
events are represented in ways more readily adapted to a formalised system of identification and evaluation. It is easy, for example, to identify where and how to use the Activity Trees to identify sequencing, path dependence, and process tracing. Congruence testing can be performed by comparing and contrasting specific points based on a more quantifiable accounting of the items within a temporal point.

Our completed model can be visualised thus:

**Figure 8. PSIAM – The Completed Model**

![PSIAM Completed Model]

**Conclusion**

Interdisciplinarity in Political Science has been a goal at least 40 years. The proposed model contributes to achieving that goal by capturing the synergies that were elusive in the ‘sum of disciplines’ approach. The Political Science Integrated Analysis Model (PSIAM) facilitates the qualitative evaluation processes we normally use, but it also allows us to quantify many of the human processes involved and guides us through a replicable, systematic, evaluation of the decision-making and policy implementation processes.

Writing a conclusion for the proposed model is a problematic issue. There remains much work to be done in defining, creating, and proving the domain and process ontology for this holistic and interdisciplinary method. Our current state of play, however, drives us to continue to seek our Holy Grail. There is, therefore, a conclusion to this paper but not to the study required to validate the acceptance of PSIAM in the field of Political Science. The author admits that much work and refinement remain to be done, however promising the initial results.
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